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INFORMATION SHEET

PRESIDING: Commissioner Brown-Bland, Presiding; Chairman Finley and Commissioners Dockham, Patterson and Gray

PLACE: Dobbs Building, Room 2115, Raleigh, NC

DATE: June 5, 2018

TIME: 10:22 a.m. – 12:18 p.m.

DOCKET NO.: E-7, Sub 1164

COMPANY: Duke Energy Carolinas, LLC

DESCRIPTION: Application for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to G.S. 62-133.9 and NCUC Rule R8-69.

VOLUME:

APPEARANCES

DUKE ENERGY PROGRESS, LLC:

Molly Jagannathan, Esq.

Kendrick Fentress, Esq.

FOR CAROLINA UTILITY CUSTOMERS ASSOCIATION, INC.:

Robert F. Page, Esq.

FOR NORTH CAROLINA SUSTAINABLE ENERGY ASSOCIATION:

Peter Ledford, Esq.

Benjamin Smith, Esq.

FOR SOUTHERN ALLIANCE FOR CLEAN ENERGY, NORTH CAROLINA JUSTICE CENTER AND NATURAL RESOURCES DEFENSE COUNCIL:

Gudrun Thompson, Esq.

David Neal, Esq.

FOR CAROLINA INDUSTRIAL GROUP FOR FAIR UTILITY RATES III:

Warren Hicks, Esq.

FOR THE USING AND CONSUMING PUBLIC:

Lucy Edmondson, Esq., Public Staff

WITNESSES

Robert P. Evans (Direct and Rebuttal)

Panel of Michael C. Maness, David Williamson and Eric Williams

Prefiled Testimonies of:

Carolyn T. Miller (Direct and Rebuttal)

Christopher Neme (Direct)

Timothy J. Duff and Richard G. Stevie, Ph.D. (Rebuttal)

EXHIBITS

Duke Energy Carolinas, LLC, Application (I/A)

Evans Exhibits A – L (I/A)

Maness Exhibits I and II (I/A)

Evans Exhibits 1 – 12, including 9A&9B (I/A)

Miller Exhibits 1 – 8 (I/A)

Williamson Exhibits 1 – 3 (I/A)

FILED

JUN 20 2018

Clerk's Office

N.C. Utilities Commission

NC Justice Center et al Evans Cross Exhibit 1 (I/A)
Evans Rebuttal Exhibits 1 and 2 (I/A)
Public Staff Evans Cross Exhibits 1, 3 – 7 (I/A)
Confidential Public Staff Evans Cross Exhibit 2 (I/A)
Stevie/Duff Stipulated Exhibits 1 – 5, 7 and 8 (I/A)
Confidential Stevie/Duff Stipulated Exhibit 6 (I/A)

Neme Exhibits Cn-1 and CN-2 (I/A)
Rebuttal Miller Exhibits 1, 2, 6 & 8 (I/A)

COPIES ORDERED: E-mail: Edmondson and Neal
REPORTED BY: Kim Mitchell
TRANSCRIBED BY: Kim Mitchell
DATE TRANSCRIBED: June 15, 2018

TRANSCRIPT PAGES: 104
PREFILED PAGES: 228
TOTAL PAGES: 332

FILED

JUN 20 2018

**Clerk's Office
N.C. Utilities Commission**

NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP

DATE 6-5-18
DOCKET #: E-7 Sub 1162 & 1164
NAME OF ATTORNEY Kendrick Fensler
TITLE _____
FIRM NAME _____
ADDRESS _____
CITY _____
ZIP _____

APPEARING FOR: DEC

APPLICANT X COMPLAINANT _____ INTERVENOR _____
PROTESTANT _____ RESPONDENT _____ DEFENDANT _____

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NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP

DATE 6-5-18
DOCKET #: E-7, Sub 1162 and 1164
NAME OF ATTORNEY Molly Jayannathan
TITLE _____
FIRM NAME _____
ADDRESS _____
CITY _____
ZIP _____

APPEARING FOR: DEC -

APPLICANT 0 COMPLAINANT _____ INTERVENOR _____
PROTESTANT _____ RESPONDENT _____ DEFENDANT _____

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NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP

DATE 6/5/18
DOCKET #: E-7, Sub 1/64
NAME OF ATTORNEY Robert F. Page
TITLE _____
FIRM NAME Crisp & Page, PLLC
ADDRESS 4016 Emerald Drive, Suite 205
CITY Raleigh, NC
ZIP 27609

APPEARING FOR: Carolina Utility Customers Association

APPLICANT _____ COMPLAINANT _____ INTERVENOR ✓
PROTESTANT _____ RESPONDENT _____ DEFENDANT _____

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NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP

DATE 6/5/18
DOCKET #: E-7 sub 1163 + 1164
NAME OF ATTORNEY Andrew Thompson
TITLE _____
FIRM NAME Southern Environmental Law Center
ADDRESS 601 W Rosemary St Ste 220
CITY Chapel Hill NC
ZIP 27516

APPEARING FOR: Siena Club (sub 1163)
NRDC, SACE + NC Justice Center (sub 1164)

APPLICANT _____ COMPLAINANT _____ INTERVENOR ☒
PROTESTANT _____ RESPONDENT _____ DEFENDANT _____

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NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP

DATE 6/5/2018

DOCKET #: E-7, Sub 1164 & E-7, Sub 1163

NAME OF ATTORNEY David L. Neal

TITLE Senior Attorney

FIRM NAME Southern Environmental Law Center

ADDRESS 601 W Rosemary St, Ste 220

CITY Chapel Hill

ZIP 27516

APPEARING FOR: N.C. Justice Center, Southern Alliance for Clean
Energy, Natural Resources Defense Council

APPLICANT _____ COMPLAINANT _____ INTERVENOR ☒
PROTESTANT _____ RESPONDENT _____ DEFENDANT _____

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NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP

DATE 6/5/18
DOCKET #: E-7, Sub 1163 + 1164
NAME OF ATTORNEY WARREN HICKS
TITLE Attorney
FIRM NAME Barlett & Dixon, LLP
ADDRESS Po Box 1351
CITY Raleigh, NC
ZIP 27602

APPEARING FOR: CIGFUR 111

APPLICANT _____ COMPLAINANT _____ INTERVENOR ☒
PROTESTANT _____ RESPONDENT _____ DEFENDANT _____

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NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP

DATE June 5, 2018
DOCKET #: E-7, sub 1162 / E-7, sub 1163 / E-7, sub 1164
NAME OF ATTORNEY Benjamin Smith
TITLE Regulatory Counsel
FIRM NAME North Carolina Sustainable Energy Association
ADDRESS 4800 Six Forks Road, Suite 300
CITY Raleigh
ZIP 27608

APPEARING FOR: North Carolina Sustainable Energy Association

APPLICANT _____ COMPLAINANT _____ INTERVENOR ☒
PROTESTANT _____ RESPONDENT _____ DEFENDANT _____

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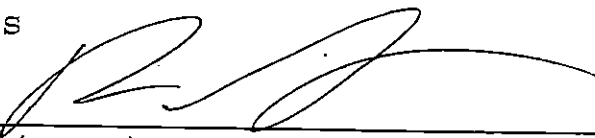
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NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP

DATE June 5, 2018
DOCKET #: E-7, Subs 1162, 1163, & 1164
NAME OF ATTORNEY Peter Laddford
TITLE General Counsel
FIRM NAME NC Sustainable Energy Association
ADDRESS 4800 Six Forks Road, Suite 300
CITY Raleigh, NC
ZIP 27609

APPEARING FOR: NC Sustainable Energy Association

APPLICANT	_____	COMPLAINANT	_____	INTERVENOR	<u>X</u>
PROTESTANT	_____	RESPONDENT	_____	DEFENDANT	_____

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NORTH CAROLINA UTILITIES COMMISSION
PUBLIC STAFF - APPEARANCE SLIP

DATE June 5, 2018 DOCKET #: E-7 Sub 1164 (1164)

PUBLIC STAFF MEMBER Lucy Edmondson

ORDER FOR TRANSCRIPT OF TESTIMONY TO BE **EMAILED** TO THE
PUBLIC STAFF - PLEASE INDICATE YOUR DIVISION AS WELL AS
YOUR EMAIL ADDRESS BELOW:

ACCOUNTING _____
WATER _____
COMMUNICATIONS _____
ELECTRIC _____
GAS _____
TRANSPORTATION _____
ECONOMICS _____
LEGAL lucy.edmondson@psncuc.nc.gov
CONSUMER SERVICES _____

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CONFIDENTIAL PORTIONS!!!!

Signature of Public Staff Member

I/A

(2) Total System DSM programs allocated to Residential and Non-Residential based on contribution to retail system peak

Duke Energy Carolinas, LLC
Vintage 2015 Estimate for January 1, 2015 to December 31, 2015
Docket Number E-7, Sub 1164
Load Impacts and Estimated Revenue Requirements, excluding Lost Revenue by Program

Residential Programs													NC Residential Revenue Requirement
EE Programs													
	System kW Reduction - Summer Peak	System Energy Reduction (kWh)	System NPV of Avoided Cost	System Cost	Earned Utility Incentive	System Cost Plus Incentive	E NC Retail kWh Sales Allocation Factor (Miller Exhibit 5 pg. 2)	D * E					
1 Appliance Recycling Program	748	5,594,546	\$ 1,901,821	\$ 1,537,241	\$ 41,869	\$ 1,579,111	72.9564706%	\$				1,152,069	
2 Energy Efficiency Education	830	4,417,898	\$ 2,498,417	\$ 2,054,672	\$ 51,091	\$ 2,105,762	72.9564706%	\$				1,536,246	
3 Energy Efficient Appliances and Devices	14,743	129,350,071	\$ 49,525,402	\$ 12,050,485	\$ 4,309,816	\$ 16,360,300	72.9564706%	\$				11,935,752	
4 HVAC Energy Efficiency	2,669	4,763,631	\$ 6,816,479	\$ 5,416,833	\$ 160,559	\$ 5,577,392	72.9564706%	\$				4,069,360	
5 Income Qualified Energy Efficiency and Weatherization Assistance	622	2,864,912	\$ 1,586,109	\$ 2,238,776	\$ 619,896	\$ 2,706,631	72.9564706%	\$				1,633,332	
6 Multi-Family Energy Efficiency	1,339	19,888,408	\$ 7,431,163	\$ 2,092,985	\$ 808,341	\$ 3,854,514	72.9564706%	\$				1,974,808	
7 Energy Assessments	1,275	10,293,765	\$ 10,115,222	\$ 8,066,179	\$ 808,341	\$ 3,854,514	72.9564706%	\$				2,841,300	
8 Subtotal	22,219	171,212,932	\$ 79,874,113	\$ 28,477,114	\$ 5,985,712	\$ 34,462,825		\$				25,142,661	
9 My Home Energy Report (1)	61,770	228,776,428	\$ 16,589,325	\$ 9,845,895	\$ 774,805	\$ 10,620,699	72.9564706%	\$				7,748,487	
10 Total for Residential Energy Efficiency Programs	83,989	399,989,360	\$ 96,457,439	\$ 38,323,008	\$ 6,760,516	\$ 45,083,525		\$				32,891,848	
NC Residential Peak Demand Allocation Factor (Miller Exhibit 5 pg. 2)													D11* E11
11 Total DSM Programs (2)	871,944	18,974	101,113,558	\$ 81,958,782	\$ 7,952,799	\$ 39,911,582	82.5218612%	\$				12,979,989	
12 Total Residential Revenue Requirement								\$				45,871,337	
NC Non-Residential Revenue Requirement													
	System kW Reduction - Summer Peak	System Energy Reduction (kWh)	System NPV of Avoided Cost	System Cost	Earned Utility Incentive	System Cost Plus Incentive	E NC Retail kWh Sales Allocation Factor (Miller Exhibit 5 pg. 2)	D * E					
Non-Residential Programs													
EE Programs													
13 Non Residential Smart Saver Custom Energy Assessments	87	765,803	\$ 321,686	\$ 660,420	\$ (38,954)	\$ 621,465	72.9564706%	\$				453,599	
14 Non Residential Smart Saver Custom	11,108	76,142,627	\$ 53,882,448	\$ 9,952,877	\$ 5,054,201	\$ 14,987,078	72.9564706%	\$				10,934,043	
15 Non Residential Smart Saver Energy Efficient Food Service Products	140	1,672,529	\$ 1,099,734	\$ 194,425	\$ 104,111	\$ 258,535	72.9564706%	\$				217,801	
16 Non Residential Smart Saver Energy Efficient HVAC Products	1,611	5,405,220	\$ 6,211,217	\$ 1,142,512	\$ 584,050	\$ 1,726,572	72.9564706%	\$				1,259,646	
17 Non Residential Smart Saver Energy Efficient Lighting Products	11,513	67,083,512	\$ 42,227,035	\$ 11,335,798	\$ 3,552,492	\$ 14,888,290	72.9564706%	\$				10,861,971	
18 Non Residential Smart Saver Energy Efficient Pumps and Drives Products	423	3,354,574	\$ 1,924,058	\$ 466,478	\$ 167,622	\$ 634,100	72.9564706%	\$				462,617	
19 Non Residential Smart Saver Energy Efficient IT Products	540	5,196,710	\$ 1,130,386	\$ 716,542	\$ 47,592	\$ 764,134	72.9564706%	\$				557,485	
20 Non Residential Smart Saver Energy Efficient Process Equipment Products	112	630,354	\$ 517,342	\$ 88,823	\$ 49,280	\$ 138,103	72.9564706%	\$				100,755	
21 Small Business Energy Saver	14,417	77,515,622	\$ 47,989,975	\$ 13,368,790	\$ 3,912,436	\$ 17,881,226	72.9564706%	\$				13,045,511	
22 Smart Energy In Offices	3,109	14,938,552	\$ 1,666,806	\$ 1,463,240	\$ 23,353	\$ 1,486,592	72.9564706%	\$				1,084,565	
23 Business Energy Report	-	-	\$ -	\$ 126,404	\$ -	\$ 126,404	72.9564706%	\$				92,220	
24 Total for Non-Residential Energy Efficiency Programs	48,072	252,704,804	\$ 156,980,188	\$ 40,096,318	\$ 13,456,181	\$ 53,552,499		\$				39,070,014	
NC Non-Residential Peak Demand Allocation Factor (Miller Exhibit 5 pg. 2)													D23* E28
25 Total DSM Programs(2)	871,944	18,974	\$ 101,113,558	\$ 81,958,782	\$ 7,952,799	\$ 39,911,582	42.4483655%	\$				16,941,814	
26 Total Non-Residential Revenue Requirement								\$				56,011,828	
Total DSM Program Breakdown													D28* E28
27 Power Manager (Residential)	454,663	-	\$ 52,718,688	\$ 14,634,279	\$ 4,879,707	\$ 19,013,986		\$					
28 EnergyWise for Business	6	18,974	\$ 11,248	\$ 1,549,305	\$ (176,876)	\$ 1,372,428		\$					
29 Power Share CallOption (Non-Residential)	-	-	\$ -	\$ -	\$ -	\$ -		\$					
30 Power Share (Non-Residential)	417,276	-	\$ 48,383,622	\$ 15,779,050	\$ 3,749,526	\$ 19,528,576		\$					
31 Disallowed Costs from 2015 Program Costs Audit (Order E-7 Sub 1105, dated 8/25/16)	-	-	\$ -	\$ (9,851)	\$ 448	\$ (9,403)		\$					
32 Total DSM	871,944	18,974	101,113,558	81,958,782	7,952,799	39,911,582	74.9702266%	\$				29,921,803	

(1) My Home Energy Report impacts reflect cumulative capability as of end of vintage year, including impacts for participants from prior vintage
(2) Total System DSM programs allocated to Residential and Non-Residential based on contribution to retail system peak

Duke Energy Carolinas, LLC
Vintage 2016 Estimate for January 1, 2016 to December 31, 2016
Docket Number E-7, Sub 1164
Load Impacts and Estimated Revenue Requirements, excluding Lost Revenue by Program

			A	B	C = (A-B) * 11.5%	D = B+C	E	NC Residential Revenue Requirement
	System kW Reduction - Summer Peak	System Energy Reduction (kWh)	System NPV of Avoided Cost	System Cost	Earned Utility Incentive	System Cost Plus Incentive	NC Retail kWh Sales Allocation Factor (Miller Exhibit 3 pg. 3)	D * E
Residential Programs								
EE Programs								
1 Appliance Recycling Program	21	164,720	\$ 59,758	\$ (97,997)	\$ 18,073	\$ (79,924)	73.0962827%	\$ (57,983)
2 Energy Efficiency Education	1,512	6,441,283	8,695,507	2,126,509	180,435	2,306,944	73.0962827%	1,686,290
3 Energy Efficient Appliances and Devices	14,518	120,226,223	82,262,218	24,069,774	6,692,131	30,761,905	73.0962827%	22,485,809
4 HVAC Energy Efficiency	2,462	6,294,837	7,476,100	7,639,566	(41,799)	7,797,767	73.0962827%	5,699,878
5 Income Qualified Energy Efficiency and Weatherization Assistance	669	4,260,402	2,418,242	4,792,436	-	4,792,436	73.0962827%	3,503,093
6 Multi-Family Energy Efficiency	1,572	15,235,497	8,950,706	2,518,988	739,848	3,258,836	73.0962827%	2,381,941
7 Energy Assessments	1,070	7,889,091	6,822,866	2,678,893	476,550	3,155,443	73.0962827%	2,306,512
8 Subtotal	21,824	160,012,051	\$ 111,685,937	\$ 43,928,769	\$ 8,065,038	\$ 51,993,807		\$ 38,005,540
9 My Home Energy Report (1)	71,814	283,569,925	20,423,954	10,822,444	1,104,174	11,926,618	73.0962827%	8,717,914
10 Total for Residential Energy Efficiency Programs	93,638	443,581,976	\$ 132,109,290	\$ 54,751,213	\$ 9,169,211	\$ 63,920,424		\$ 46,723,454
Non-Residential Programs								
EE Programs								
11 Non Residential Smart Saver Custom Energy Assessments	1,584	15,953,402	\$ 9,572,687	\$ 2,034,308	\$ 866,914	\$ 2,901,222	73.0962827%	\$ 2,120,685
14 Non Residential Smart Saver Custom	7,934	52,154,624	89,025,086	7,356,309	8,829,838	10,986,347	73.0962827%	8,030,611
15 Non Residential Smart Saver Energy Efficient Food Service Products	356	3,809,316	2,474,312	324,117	247,272	571,389	73.0962827%	417,664
16 Non Residential Smart Saver Energy Efficient HVAC Products	868	3,916,301	3,344,669	1,473,991	215,128	1,689,119	73.0962827%	1,234,683
17 Non Residential Smart Saver Energy Efficient Lighting Products	29,268	187,347,422	120,392,699	39,622,944	9,288,515	48,911,459	73.0962827%	35,752,458
18 Non Residential Smart Saver Energy Efficient Pumps and Drives Products	368	2,464,340	1,574,965	471,830	126,849	598,779	73.0962827%	437,685
19 Non Residential Smart Saver Energy Efficient IT Products	107	2,462,027	777,601	285,430	56,600	342,030	73.0962827%	250,011
20 Non Residential Smart Saver Energy Efficient Process Equipment Products	50	313,131	279,184	125,347	17,622	143,569	73.0962827%	104,944
21 Non Residential Smart Saver Performance Incentive	-	-	-	35,670	(4,102)	31,568	73.0962827%	23,075
22 Small Business Energy Saver	16,110	85,687,928	55,685,830	15,360,852	4,637,372	19,998,224	73.0962827%	14,617,959
23 Smart Energy in Offices	3,505	16,842,267	1,843,559	1,061,729	89,911	1,151,640	73.0962827%	841,806
24 Business Energy Report	388	5,561,349	302,497	263,169	-	263,169	73.0962827%	192,867
25 Total for Non-Residential Energy Efficiency Programs	60,480	356,937,707	\$ 235,273,030	\$ 68,416,598	\$ 19,171,918	\$ 87,588,514		\$ 64,028,948
Total DSM Program Breakdown								
26 Power Manager (Residential)	455,993	-	\$ 54,179,776	\$ 13,644,970	\$ 4,661,503	\$ 18,306,473		
27 EnergyWise for Business (Non-Residential)	1,199	718,623	\$ 574,590	\$ 470,304	\$ 11,993	\$ 482,297		
29 Power Share CallOption (Non-Residential)	-	-	\$ -	\$ -	\$ -	\$ -		
30 Power Share (Non-Residential)	568,900	-	\$ 43,889,394	\$ 14,291,024	\$ 5,403,812	\$ 17,694,836		
31 Total DSM	825,492	718,623	\$ 98,643,760	\$ 28,406,298	\$ 8,077,808	\$ 36,483,606	74.6159917%	\$ 27,221,875
NC Residential Peak Demand Allocation Factor (Miller Exhibit 3 pg. 3)								
								D11* E11
11 Total DSM Programs (2)	825,492	718,623	\$ 98,643,760	\$ 28,406,298	\$ 8,077,808	\$ 36,483,606	33.7973480%	\$ 12,330,491
12 Total Residential Revenue Requirement								\$ 59,053,945
NC Non-Residential Revenue Requirement								
NC Retail kWh Sales Allocation Factor (Miller Exhibit 3 pg. 3)								
								D24* E24
26 Total DSM Programs(2)	825,492	718,623	\$ 98,643,760	\$ 28,406,298	\$ 8,077,808	\$ 36,483,606	40.8166437%	\$ 14,891,304
27 Total Non-Residential Revenue Requirement								\$ 78,915,332
NC Retail Peak Demand Allocation Factor (Miller Exhibit 3 pg. 3)								
								D29* E29

(1) My Home Energy Report impacts reflect cumulative capability as of end of vintage year, including impacts for participants from prior vintage
(2) Total System DSM programs allocated to Residential and Non-Residential based on contribution to retail system peak

Duke Energy Carolinas, LLC
Vintage 2017 Actual for January 1, 2017 to December 31, 2017
Docket Number E-7, Sub 1164
Load Impacts and Estimated Revenue Requirements, excluding Lost Revenue by Program

	A	B	C = (A-B) * 11.5%	D = B+C	E	NC Residential Revenue Requirement		
	System kW Reduction - Summer Peak	System Energy Reduction (kWh)	System NPV of Avoided Cost	System Cost	Earned Utility Incentive	System Cost Plus Incentive	NC Retail kWh Sales Allocation Factor (Miller Exhibit 5 pg. 4)	D * E
Residential Programs								
EE Programs								
1 Appliances Recycling Program	-	-	\$ -	\$ 5,807	\$ (610)	\$ 4,697	72.8087506%	\$ 3,420
2 Energy Efficiency Education	1,393	5,932,086	\$ 3,597,724	\$ 2,077,611	\$ 174,813	\$ 2,252,424	72.8087506%	\$ 1,639,962
3 Energy Efficient Appliances and Devices	23,860	141,300,087	\$ 106,282,505	\$ 30,340,728	\$ 8,733,304	\$ 39,074,032	72.8087506%	\$ 28,449,314
4 Residential - Smart Saver Energy Efficiency Program	2,478	8,545,577	\$ 8,895,209	\$ 7,403,327	\$ 171,566	\$ 7,574,894	72.8087506%	\$ 5,515,185
5 Income Qualified Energy Efficiency and Weatherization Assistance	782	4,951,901	\$ 2,766,923	\$ 5,505,992	\$ -	\$ 5,505,992	72.8087506%	\$ 4,008,844
6 Multi-Family Energy Efficiency	1,918	19,056,155	\$ 13,325,932	\$ 3,168,422	\$ 1,168,114	\$ 4,336,535	72.8087506%	\$ 3,157,377
7 Energy Assessments	1,274	8,131,752	\$ 7,275,644	\$ 2,909,098	\$ 502,153	\$ 3,411,251	72.8087506%	\$ 2,483,689
8 Subtotal	31,706	187,317,557	\$ 142,143,937	\$ 51,410,486	\$ 10,749,340	\$ 62,159,826	72.8087506%	\$ 45,257,793
9 My Home Energy Report (1)	79,070	311,868,855	\$ 21,728,369	\$ 15,812,250	\$ 910,354	\$ 14,722,603	72.8087506%	\$ 10,719,344
10 Total for Residential Energy Efficiency Programs	110,776	499,286,413	\$ 163,872,305	\$ 65,222,736	\$ 11,659,693	\$ 76,882,429		\$ 55,977,136
							NC Residential Peak Demand Allocation Factor (Miller Exhibit 5 pg. 4)	D11* F11
11 SubTotal DSM Programs (2)	846,941	2,943,906	\$ 105,087,510	\$ 29,822,652	\$ 8,655,459	\$ 38,478,111	83.8075104%	\$ 13,008,491
12 Total DSM Programs								\$ 13,008,491
13 Total Residential Revenue Requirement								\$ 68,985,627
							NC Non-Residential Revenue Requirement	
	System kW Reduction - Summer Peak	System Energy Reduction (kWh)	System NPV of Avoided Cost	System Cost	Earned Utility Incentive	System Cost Plus Incentive	NC Retail kWh Sales Allocation Factor (Miller Exhibit 5 pg. 4)	D * E
Non-Residential Programs								
EE Programs								
14 Non Residential Smart Saver Custom Energy Assessments	1,604	15,633,234	\$ 10,206,769	\$ 2,139,875	\$ 927,693	\$ 3,067,568	72.8087506%	\$ 2,233,458
15 Non Residential Smart Saver Custom	6,222	41,833,254	\$ 35,755,444	\$ 7,304,838	\$ 3,271,820	\$ 10,576,658	72.8087506%	\$ 7,700,792
16 Non Residential Smart Saver Energy Efficient Food Service Products	226	2,257,329	\$ 1,591,382	\$ 306,488	\$ 147,763	\$ 454,251	72.8087506%	\$ 330,784
17 Non Residential Smart Saver Energy Efficient HVAC Products	1,031	3,382,708	\$ 3,396,965	\$ 1,560,769	\$ 211,162	\$ 1,771,932	72.8087506%	\$ 1,290,121
18 Non Residential Smart Saver Energy Efficient Lighting Products	32,963	229,728,893	\$ 193,505,560	\$ 66,689,770	\$ 14,560,615	\$ 81,250,385	72.8087506%	\$ 59,157,537
19 Non Residential Smart Saver Energy Efficient Pumps and Drives Products	498	3,470,697	\$ 2,214,300	\$ 520,937	\$ 193,817	\$ 714,753	72.8087506%	\$ 526,228
20 Non Residential Smart Saver Energy Efficient IT Products	-	3,830	\$ 591	\$ 61,215	\$ (5,778)	\$ 55,437	72.8087506%	\$ 39,494
21 Non Residential Smart Saver Energy Efficient Process Equipment Products	87	577,560	\$ 446,289	\$ 162,413	\$ 32,645	\$ 195,059	72.8087506%	\$ 142,020
22 Non Residential Smart Saver Performance Incentive	9	12,810	\$ 9,274	\$ 320,559	\$ (35,798)	\$ 284,762	72.8087506%	\$ 207,331
23 Small Business Energy Saver	19,276	97,516,700	\$ 69,324,378	\$ 17,350,972	\$ 5,976,942	\$ 23,327,914	72.8087506%	\$ 16,984,763
24 Smart Energy In Offices	2,158	10,272,154	\$ 1,067,480	\$ 891,010	\$ 20,284	\$ 911,304	72.8087506%	\$ 663,509
25 Business Energy Report	8	42,398	\$ 695	\$ 126,680	\$ -	\$ 126,680	72.8087506%	\$ 92,234
26 Sub-Total for Non-Residential Energy Efficiency Programs	64,499	404,731,067	\$ 317,319,129	\$ 97,443,527	\$ 25,300,182	\$ 122,743,709		\$ 89,368,161
27 Total for Non-Residential Energy Efficiency Programs								\$ 89,368,161
							NC Non-Residential Peak Demand Allocation Factor (Miller Exhibit 5 pg. 4)	D24* E24
28 Total DSM Programs(2)	846,941	2,943,906	\$ 105,087,510	\$ 29,822,652	\$ 8,655,459	\$ 38,478,111	40.0747013%	\$ 15,419,988
29 Total Non-Residential DSM Programs								\$ 15,419,988
30 Total Non-Residential Revenue Requirement								\$ 104,788,149
							NC Retail Peak Demand Allocation Factor (Miller Exhibit 5 pg. 4)	D29* E29
Total DSM Program Breakdown								
31 Power Manager (Residential)	501,118	-	\$ 61,074,105	\$ 14,021,500	\$ 5,411,050	\$ 19,432,549		
32 EnergyWise for Business (Non-Residential)	5,459	2,943,906	\$ 2,530,761	\$ 2,484,618	\$ 5,906	\$ 2,489,924		
33 Power Share CallOption (Non-Residential)	-	-	\$ -	\$ -	\$ -	\$ -		
34 Power Share (Non-Residential)	340,389	-	\$ 41,482,644	\$ 15,315,535	\$ 3,239,103	\$ 16,555,638		
35 Total DSM	846,941	2,943,906	\$ 105,087,510	\$ 29,822,652	\$ 8,655,459	\$ 38,478,111	73.8822117%	\$ 28,428,479

(1) My Home Energy Report Impacts reflect cumulative capability as of end of vintage year, including Impacts for participants from prior vintage
(2) Total System DSM programs allocated to Residential and Non-Residential based on contribution to retail system peak

Exhibit 3, page 5

Duke Energy Carolinas, LLC
Vintage 2019 Estimate for January 1, 2019 to December 31, 2019
Docket Number E-7, Sub 1164
Load Impacts and Estimated Revenue Requirements, excluding Lost Revenue by Program

			A	B	C = (A-B) *11.5%	D= B+C	E	NC Residential Revenue Requirement
	System kW Reduction - Summer Peak	System Energy Reduction (kWh)	System NPV of Avoided Cost	System Cost	Earned Utility Incentive	System Cost Plus Incentive	NC Retail kWh Sales Allocation Factor (Miller Exhibit 3 pg. 4)	D * E
Residential Programs								
EE Programs								
1 Appliance Recycling Program	-	-	\$ -	\$ -	\$ -	\$ -	72.8087506%	\$ -
2 Energy Efficiency Education	1,339	5,701,506	2,565,053	2,104,087	53,011	2,157,098	72.8087506%	1,570,556
3 Energy Efficient Appliances and Devices	16,726	97,320,521	52,102,485	21,726,700	8,493,218	25,219,918	72.8087506%	18,362,304
4 Residential – Smart Saver Energy Efficiency Program	1,294	5,130,636	4,520,986	4,802,289	(82,550)	4,769,939	72.8087506%	3,472,933
5 Income Qualified Energy Efficiency and Weatherization Assistance	639	4,043,435	1,523,619	7,905,880	-	7,905,880	72.8087506%	5,756,172
6 Multi-Family Energy Efficiency	2,001	19,846,385	9,552,489	3,382,816	709,512	4,092,328	72.8087506%	2,979,578
7 Energy Assessments	1,040	6,542,935	4,216,535	2,887,118	141,583	3,128,501	72.8087506%	2,277,823
8 Subtotal	28,038	138,585,479	\$ 74,481,147	\$ 42,808,890	\$ 4,364,769	\$ 47,273,659		\$ 34,419,361
9 My Home Energy Report (1)	79,359	512,934,099	20,858,118	13,406,971	856,882	14,263,852	72.8087506%	10,385,338
10 Total for Residential Energy Efficiency Programs	102,397	451,519,578	\$ 95,339,264	\$ 56,215,861	\$ 5,221,651	\$ 61,537,512		\$ 44,804,694
							NC Residential Peak Demand Allocation Factor (Miller Exhibit 3 pg. 4)	D11* E11
11 SubTotal DSM Programs (2)	888,945	2,885,926	102,613,710	\$ 51,286,990	\$ 8,202,573	\$ 39,489,563	33.8075104%	\$ 13,350,438
12 Total DSM Programs								\$ 13,350,438
13 Total Residential Revenue Requirement								\$ 58,155,132
							NC Non-Residential Revenue Requirement	
	System kW Reduction - Summer Peak	System Energy Reduction (kWh)	System NPV of Avoided Cost	System Cost	Earned Utility Incentive	System Cost Plus Incentive	NC Retail kWh Sales Allocation Factor (Miller Exhibit 3 pg. 4)	D * E
Non-Residential Programs								
EE Programs								
14 Non Residential Smart Saver Custom Energy Assessments	1,008	8,831,594	\$ 3,504,112	\$ 1,618,240	\$ 216,875	\$ 1,835,115	72.8087506%	\$ 1,336,124
15 Non Residential Smart Saver Custom	6,927	60,678,525	24,075,425	10,095,189	1,607,727	11,702,916	72.8087506%	8,520,747
16 Non Residential Smart Saver Energy Efficient Food Service Products	1,159	10,601,930	5,383,903	2,010,534	387,937	2,398,471	72.8087506%	1,746,297
17 Non Residential Smart Saver Energy Efficient HVAC Products	5,012	13,318,652	11,734,281	5,762,803	686,720	6,449,523	72.8087506%	4,695,817
18 Non Residential Smart Saver Energy Efficient Lighting Products	16,312	122,943,286	61,974,803	17,828,618	5,076,811	22,905,429	72.8087506%	16,677,157
19 Non Residential Smart Saver Energy Efficient Pumps and Drives Products	978	6,310,561	2,965,783	1,185,494	207,040	1,392,474	72.8087506%	999,281
20 Non Residential Smart Saver Energy Efficient IT Products	50	6,503,152	1,771,808	749,325	117,585	866,911	72.8087506%	631,187
21 Non Residential Smart Saver Energy Efficient Process Equipment Products	129	1,052,919	511,338	240,281	34,241	274,521	72.8087506%	197,891
22 Non Residential Smart Saver Performance Incentive	2,459	21,489,480	8,526,383	9,162,160	615,836	3,779,046	72.8087506%	2,751,476
23 Small Business Energy Saver	14,501	75,258,073	37,880,472	14,602,066	2,677,017	17,279,082	72.8087506%	12,580,684
24 Smart Energy to Offices	-	-	-	-	-	-	72.8087506%	-
25 Business Energy Report	-	-	-	-	-	-	72.8087506%	-
26 Sub-Total for Non-Residential Energy Efficiency Programs	48,530	826,988,173	\$ 158,378,908	\$ 57,234,649	\$ 11,625,840	\$ 68,860,489		\$ 50,136,461
27 Total for Non-Residential Energy Efficiency Programs								\$ 50,136,461
							NC Non-Residential Peak Demand Allocation Factor (Miller Exhibit 3 pg. 4)	D24* E24
28 Total DSM Programs(2)	888,945	2,885,926	\$ 102,613,710	\$ 51,286,990	\$ 8,202,573	\$ 39,489,563	40.0747013%	\$ 15,825,324
29 Total Non-Residential DSM Programs								\$ 15,825,324
30 Total Non-Residential Revenue Requirement								\$ 65,981,786
							NC Retail Peak Demand Allocation Factor (Miller Exhibit 3 pg. 4)	D29* E29
Total DSM Program Breakdown								
31 Power Manager (Residential)	554,419	-	\$ 60,847,789	\$ 14,055,575	\$ 3,381,105	\$ 19,436,679		\$ 19,436,679
32 EnergyWise for Business (Non-Residential)	16,662	2,885,926	\$ 3,297,534	\$ 3,967,504	\$ [77,047]	\$ 3,890,458		\$ 3,890,458
33 Power Share CallOption (Non-Residential)	-	-	\$ -	\$ -	\$ -	\$ -		\$ -
34 Power Share (Non-Residential)	837,864	-	\$ 38,468,387	\$ 13,769,911	\$ 2,898,515	\$ 16,167,426		\$ 16,167,426
35 Total DSM	888,945	2,885,926	\$ 102,613,710	\$ 31,286,990	\$ 8,202,573	\$ 39,489,563	73.8822117%	\$ 29,175,763

(1) My Home Energy Report impacts reflect cumulative capability as of end of vintage year, including impacts for participants from prior vintage
(2) Total System DSM programs allocated to Residential and Non-Residential based on contribution to retail system peak

I/A

Evans Exhibit 2, page 1

Duke Energy Carolinas, LLC
For the Period January 1, 2017 - December 31, 2017
Docket Number E-7, Sub 1164
North Carolina Net Lost Revenue Estimates for Vintages 2014 - 2019

Line	Residential	Vintage 2014					Total
		2014	2015	2016	2017 ^(d)	2018	
1	Energy Assessments	\$ 310,188	\$ 500,867	\$ 501,049	\$ 189,373		\$ 1,501,478
2	My Home Energy Report	6,638,564	-	-	-		6,638,564
3	Energy Efficient Appliances and Devices	3,920,850	8,151,042	8,152,670	4,192,091		24,416,653
4	HVAC Energy Efficiency	117,000	219,682	219,714	101,824		658,219
5	Appliance Recycle Program	107,888	256,657	256,757	147,355		768,658
6	Income Qualified Energy Efficiency and Weatherization Assistance	85,574	159,285	159,363	74,793		479,016
7	Multi-Family Energy Efficiency	179,326	500,657	500,420	318,697		1,499,100
8	Energy Efficiency Education	130,479	321,730	321,836	189,706		963,752
9	Total Lost Revenues	11,489,869	10,109,920	10,111,809	5,213,840	-	36,925,438
10	Found Residential Revenues *						-
11	Net Lost Residential Revenues	\$ 11,489,869	\$ 10,109,920	\$ 10,111,809	\$ 5,213,840	\$ -	\$ 36,925,438

	Non-Residential	2014	2015	2016	2017 ^(d)	2018	2019	Total
12	Nonresidential Smart Saver Custom Energy Assessments	\$ 166,013	\$ 225,057	\$ 224,335	\$ 52,083		\$	667,487
13	Non Residential Smart Saver Custom	1,189,509	1,955,817	1,950,017	724,597			5,819,440
14	Energy Management Information Systems							-
15	Non Residential Smart Saver Energy Efficient Food Service Products	44,048	73,677	73,746	29,610			221,081
16	Non Residential Smart Saver Energy Efficient HVAC Products	98,688	174,818	174,680	75,587			523,773
17	Non Residential Smart Saver Energy Efficient Lighting Products	1,312,340	2,408,423	2,390,985	1,012,227			7,063,975
18	Non Residential Smart Saver Energy Efficient Pumps and Drives Products	94,582	169,755	169,726	74,452			508,516
19	Non Residential Smart Saver Energy Efficient IT Products	419	3,025	3,013	2,556			9,013
20	Non Residential Smart Saver Energy Efficient Process Equipment Products	19,578	29,107	28,991	8,775			86,451
21	Smart Business Energy Saver	20,550	245,994	246,943	224,806			738,294
22	Smart Energy in Offices	55,770	309,619	-	-			365,389
23	Total Lost Revenues	3,001,497	5,594,793	5,202,436	2,204,693	-		16,003,418
24	Found Non-Residential Revenues *	1,474						1,474
25	Net Lost Non-Residential Revenues	\$ 3,000,022	\$ 5,594,793	\$ 5,202,436	\$ 2,204,693	\$ -	\$	16,001,944

Line	Residential	2014	Vintage 2015			2017 ^(d)	2018	2019	Total
			2015	2016					
26	Residential Energy Assessments		\$ 283,798	\$ 477,738	\$ 473,182	\$ 115,847		\$	1,350,564
27	My Home Energy Report		10,047,270	-	-	-			10,047,270
28	Energy Efficient Appliances and Devices		3,690,771	6,169,123	6,116,216	1,515,035			17,491,146
29	HVAC Energy Efficiency		132,089	234,967	232,892	63,375			663,323
30	Appliance Recycle Program		150,786	279,840	277,098	80,309			788,032
31	Income Qualified Energy Efficiency and Weatherization Assistance		65,602	135,872	134,562	38,334			374,370
32	Multi-Family Energy Efficiency		336,658	681,177	676,879	185,916			1,880,630
33	Energy Efficiency Education		89,806	220,572	218,470	57,519			586,368
34	Total Lost Revenues		14,796,779	8,199,289	8,129,299	2,056,336			33,181,702
35	Found Residential Revenues *								-
36	Net Lost Residential Revenues		\$ 14,796,779	\$ 8,199,289	\$ 8,129,299	\$ 2,056,336		\$	33,181,702

	Non-Residential	2014	2015	2016	2017 ^(d)	2018	2019	Total
37	Nonresidential Smart Saver Custom Energy Assessments		\$ 5,659	\$ 22,194	\$ 21,744	\$ 7,229	\$	56,826
38	Non Residential Smart Saver Custom		1,432,898	2,477,128	2,416,373	533,772		6,860,171
39	Energy Management Information Services		-	-	-	-		-
40	Non Residential Smart Saver Energy Efficient Food Service Products		33,714	65,479	64,761	17,349		181,302
41	Non Residential Smart Saver Energy Efficient HVAC Products		109,819	196,207	193,346	50,089		549,461
42	Non Residential Smart Saver Energy Efficient Lighting Products		1,439,011	2,400,931	2,289,093	540,562		6,669,598
43	Non Residential Smart Saver Energy Efficient Pumps and Drives Products		51,265	82,153	80,494	16,818		230,731
44	Non Residential Smart Saver Energy Efficient IT Products		58,585	173,258	170,131	54,912		456,886
45	Non Residential Smart Saver Energy Efficient Process Equipment Products		14,723	25,414	24,674	5,909		70,720
46	Smart Business Energy Saver		1,832,775	3,599,216	3,572,716	1,040,910		10,045,616
47	Smart Energy in Offices		178,960	387,139	-	-		566,099
48	EnergyWise for Business		-	-	-	-		-
49	Total Lost Revenues		5,157,409	9,429,119	8,833,331	2,267,550		25,687,409
50	Found Non-Residential Revenues *							-
51	Net Lost Non-Residential Revenues		\$ 5,157,409	\$ 9,429,119	\$ 8,833,331	\$ 2,267,550	\$	25,687,409

Line	Residential	Vintage 2016					Total	
		2014	2015	2016	2017 ⁴	2018		2019
52	Residential Energy Assessments			\$ 193,357	\$ 336,600	\$ 111,591	\$	641,548
53	My Home Energy Report			13,052,806				13,052,806
54	Energy Efficient Appliances and Devices			2,655,848	5,787,926	1,918,854		10,372,128
55	HVAC Energy Efficiency			132,531	534,414	110,865		577,810
56	Appliance Recycle Program			5,090	8,147	2,701		15,943
57	Income Qualified Energy Efficiency and Weatherization Assistance			99,176	209,079	69,314		577,569
58	Multi-Family Energy Efficiency			347,362	698,540	231,533		1,277,435
59	Energy Efficiency Education			142,689	801,026	99,786		543,511
60	Total Lost Revenues		-	16,638,364	7,675,731	2,544,634		26,858,749
61	Found Residential Revenues *							-
62	Net Lost Residential Revenues		\$ -	\$ 16,638,364	\$ 7,675,731	\$ 2,544,634	\$	26,858,749

	Non-Residential	2016	2019	2016	2017 ^(a)	2018	2019	Total
63	Nonresidential Smart Saver Custom Energy Assessments			\$ 199,079	\$ 889,585	\$ 129,503		\$ 718,167
64	Non Residential Smart Saver Custom			914,009	1,703,790	572,603		3,190,402
65	Energy Management Information Services			-	-	-		-
66	Non Residential Smart Saver Energy Efficient Food Service Products			24,889	66,328	22,069		113,286
67	Non Residential Smart Saver Energy Efficient HVAC Products			46,952	103,028	94,301		184,281
68	Non Residential Smart Saver Energy Efficient Lighting Products			2,925,514	6,589,455	2,188,879		11,703,848
69	Non Residential Smart Saver Energy Efficient Pumps and Drives Products			38,898	66,558	22,256		127,711
70	Non Residential Smart Saver Energy Efficient IT Products			59,904	75,403	25,073		160,381
71	Non Residential Smart Saver Energy Efficient Process Equipment Products			4,731	10,652	9,592		18,973
72	Small Business Energy Saver			2,145,932	4,946,981	1,448,429		7,941,336
73	Smart Energy In Offices			227,062	418,353	-		645,616
74	Business Energy Report			-	-	-		-
75	EnergyWise for Business			15,922	36,788	12,255		64,964
76	Total Lost Revenues			6,602,893	13,807,121	4,458,954		24,868,967
77	Found Non-Residential Revenues *			-	-	-		-
78	Net Lost Non-Residential Revenues			\$ 6,602,893	\$ 13,807,121	\$ 4,458,954		\$ 24,868,967

Line	Residential	Vintage 2017					Total	
		2014	2015	2016	2017 ^(a)	2018		2019
78	Residential Energy Assessments				\$ 205,575	\$ -	\$ 566,739	\$ 772,314
79	My Home Energy Report				14,455,527	-	-	14,455,527
80	Energy Efficient Appliances and Devices				3,426,482	3,085,975	6,635,996	13,147,854
81	Residential – Smart Saver Energy Efficiency Program				237,440	-	433,059	670,499
82	Appliance Recycle Program				-	-	-	-
83	Income Qualified Energy Efficiency and Weatherization Assistance				129,311	249,170	242,487	620,968
84	Multi-Family Energy Efficiency				535,629	605,219	946,417	2,087,258
85	Energy Efficiency Education				165,284	262,244	279,889	707,417
86	Total Lost Revenues		-	-	19,155,248	4,202,002	8,904,587	32,261,836
87	Found Residential Revenues *				-	-	-	-
88	Net Lost Residential Revenues		\$ -	\$ -	\$ 19,155,248	\$ 4,202,002	\$ 8,904,587	\$ 32,261,836

	Non-Residential	2014	2019	2016	2017 ^(a)	2018	2019	Total
89	Nonresidential Smart Saver Custom Energy Assessments				\$ 215,024	\$ 583,160	\$ 855,020	\$ 953,203
90	Non Residential Smart Saver Custom				447,290	2,833,159	916,764	4,197,213
91	Energy Management Information Services				-	-	-	-
92	Non Residential Smart Saver Energy Efficient Food Service Products				42,360	117,567	69,865	229,791
93	Non Residential Smart Saver Energy Efficient HVAC Products				69,985	188,797	181,612	390,393
94	Non Residential Smart Saver Energy Efficient Lighting Products				5,277,868	1,870,239	8,730,546	15,878,653
95	Non Residential Smart Saver Energy Efficient Pumps and Drives Products				45,557	98,438	93,863	237,857
96	Non Residential Smart Saver Energy Efficient IT Products				88	102,038	186	102,311
97	Non Residential Smart Saver Energy Efficient Process Equipment Products				7,200	18,834	10,553	31,589
98	Non Residential Smart Saver Performance Incentive				68	-	818	885
99	Small Business Energy Saver				2,267,155	2,997,757	4,099,390	9,304,302
100	Smart Energy in Offices				209,239	854,849	-	1,063,888
101	Business Energy Report				-	-	-	-
102	EnergyWise for Business				85,270	67,251	162,762	315,284
103	Total Lost Revenues			-	8,667,102	9,466,867	14,570,881	32,704,850
104	Found Non-Residential Revenues *				-	-	-	-
105	Net Lost Non-Residential Revenues			\$ -	\$ 8,667,102	\$ 9,466,867	\$ 14,570,881	\$ 32,704,850

* Found Revenues - See Evans Exhibit 4

(a) Lost revenues were estimated by applying forecasted lost revenue rates for residential and non-residential customers to state specific forecasted program participation.

Evans Exhibit 2, page 9

Line	Residential	Vintage 2018		2016	2017 ^(a)	2018	2019	Total
		2014	2015					
106	Residential Energy Assessments					\$ 189,591	\$ 353,963	\$ 543,555
107	My Home Energy Report					15,916,706	-	15,916,706
108	Energy Efficient Appliances and Devices					2,465,108	4,054,825	6,519,833
109	Residential - Smart Saver Energy Efficiency Program					145,809	213,538	359,446
110	Appliance Recycle Program					-	-	-
111	Income Qualified Energy Efficiency and Weatherization Assistance					131,969	246,384	378,353
112	Multi-Family Energy Efficiency					624,158	1,165,290	1,789,448
113	Energy Efficiency Education					139,276	260,025	399,301
114	Total Lost Revenues					19,612,717	6,294,025	25,906,742
115	Found Residential Revenues *							
116	Net Lost Residential Revenues					\$ 19,612,717	\$ 6,294,025	\$ 25,906,742

Line	Non-Residential	Vintage 2018		2016	2017 ^(a)	2018	2019	Total
		2014	2015					
117	Nonresidential Smart Saver Custom Energy Assessments					\$ 269,062	\$ 549,855	\$ 812,917
118	Non Residential Smart Saver Custom					1,286,383	2,688,812	3,975,195
119	Energy Management Information Services					-	-	-
120	Non Residential Smart Saver Energy Efficient Food Service Products					10,829	26,794	37,622
121	Non Residential Smart Saver Energy Efficient HVAC Products					59,787	134,931	194,719
122	Non Residential Smart Saver Energy Efficient Lighting Products					1,215,496	2,987,074	4,202,570
123	Non Residential Smart Saver Energy Efficient Pumps and Drives Products					25,728	49,390	75,118
124	Non Residential Smart Saver Energy Efficient IT Products					48,416	117,948	166,363
125	Non Residential Smart Saver Energy Efficient Process Equipment Products					4,509	11,082	15,592
126	Non Residential Smart Saver Performance Incentive					77,007	160,962	237,969
126	Small Business Energy Saver					1,280,808	3,493,893	4,774,692
127	Smart Energy In Offices					707,251	-	707,251
128	Business Energy Report					-	-	-
129	EnergyWise for Business					47,682	51,234	98,917
130	Total Lost Revenues					5,026,998	10,271,966	15,298,963
131	Found Non-Residential Revenues *							
132	Net Lost Non-Residential Revenues					\$ 5,026,998	\$ 10,271,966	\$ 15,298,963

* Found Revenues - See Evans Exhibit 4

(a) Lost revenues were estimated by applying forecasted lost revenue rates for residential and non-residential customers to state specific forecasted program participation.

Line	Residential	Vintage 2019		2016	2017 ^(a)	2018	2019	Total
		2014	2015					
132	Residential Energy Assessments						\$ 178,309	\$ 178,309
133	My Home Energy Report						15,206,604	15,206,604
134	Energy Efficient Appliances and Devices						2,553,378	2,553,378
135	Residential - Smart Saver Energy Efficiency Program						129,065	129,065
136	Appliance Recycle Program						-	-
137	Income Qualified Energy Efficiency and Weatherization Assistance						99,398	99,398
138	Multi-Family Energy Efficiency						496,951	496,951
139	Energy Efficiency Education						119,459	119,459
140	Total Lost Revenues						18,783,204	18,783,204
141	Found Residential Revenues *							
142	Net Lost Residential Revenues						\$ 18,783,204	\$ 18,783,204

Line	Non-Residential	Vintage 2019		2016	2017 ^(a)	2018	2019	Total
		2014	2015					
143	Nonresidential Smart Saver Custom Energy Assessments						\$ 145,699	\$ 145,699
144	Non Residential Smart Saver Custom						1,059,600	1,059,600
145	Energy Management Information Services						-	-
146	Non Residential Smart Saver Energy Efficient Food Service Products						146,435	146,435
147	Non Residential Smart Saver Energy Efficient HVAC Products						199,528	199,528
148	Non Residential Smart Saver Energy Efficient Lighting Products						1,921,414	1,921,414
149	Non Residential Smart Saver Energy Efficient Pumps and Drives Products						77,800	77,800
150	Non Residential Smart Saver Energy Efficient IT Products						77,654	77,654
151	Non Residential Smart Saver Energy Efficient Process Equipment Products						18,722	18,722
152	Non Residential Smart Saver Performance Incentive						375,261	375,261
152	Small Business Energy Saver						1,523,101	1,523,101
153	Smart Energy In Offices						-	-
154	Business Energy Report						-	-
155	EnergyWise for Business						51,234	51,234
156	Total Lost Revenues						5,590,446	5,590,446
157	Found Non-Residential Revenues *							
158	Net Lost Non-Residential Revenues						\$ 5,590,446	\$ 5,590,446

* Found Revenues - See Evans Exhibit 4

(a) Lost revenues were estimated by applying forecasted lost revenue rates for residential and non-residential customers to state specific forecasted program participation.

I/A

Duke Energy Carolinas, LLC
For the Period January 1, 2017 - December 31, 2017
Docket Number E-7 Sub 1164
Actual Program Costs for Vintage Years 2014, 2015, 2016 and 2017

	Carolinas System - 12 Months Ended 12/31/2014	Carolinas System - 12 months Ended 12/31/2015	Carolinas System - 12 months Ended 12/31/2016	Carolinas System - 12 months Ended 12/31/2017
1 Residential Energy Assessments	\$ 3,605,737	\$ 3,086,173	2,678,893	2,909,098
2 My Home Energy Report	8,285,066	9,845,895	10,822,444	13,812,250
3 Energy Efficient Appliances and Devices	14,738,129	12,050,485	24,069,774	30,340,728
4 Residential - Smart Saver Energy Efficiency Program	4,786,807	5,416,833	7,839,566	7,403,327
5 Appliance Recycle Program	1,515,867	1,537,241	(97,397)	5,307
6 Income Qualified Energy Efficiency and Weatherization Assistance	1,917,192	2,238,776	4,792,436	5,505,992
7 Multi family Energy Efficiency	1,442,533	2,092,935	2,518,988	3,168,422
8 Energy Efficiency Education	1,963,153	2,054,672	2,126,509	2,077,611
9 Nonresidential Smart Saver Custom Energy Assessments	1,458,195	660,420	2,034,308	2,139,875
10 Energy Management Information Systems	74,855	-	-	-
11 Non-Residential Smart Saver Custom	8,136,712	9,932,877	7,356,509	7,304,838
12 Non-Residential Smart Saver Performance Incentive	-	-	35,670	320,559
13 Non-Residential Energy Efficient Food Service Products	199,350	194,425	324,117	306,488
14 Non-Residential Smart Saver Energy Efficient HVAC Products	815,339	1,142,522	1,473,991	1,560,769
15 Non-Residential Smart Saver Energy Efficient Lighting Products	6,727,675	11,335,798	39,622,944	66,689,770
16 Nonresidential Energy Efficient Pumps and Drives Products	584,874	466,478	471,930	528,937
17 Nonresidential Energy Efficient ITEE	25,730	716,542	285,430	61,215
18 Nonresidential Energy Efficient Process Equipment Products	89,809	88,823	125,947	162,413
19 Smart Energy In Offices	1,156,497	1,463,240	1,061,729	891,010
20 Small Business Energy Saver	1,026,607	13,968,790	15,360,852	17,350,972
21 Business Energy Report	-	126,404	263,169	126,680
22 Power Manager	15,662,693	14,634,279	13,644,970	14,021,500
23 EnergyWise for Business	-	1,549,305	470,304	2,484,618
24 Power Share	15,520,492	15,779,050	14,291,024	13,316,535
25 Disallowed Costs from 2015 Program Costs Audit (Order E-7 Sub 1105, dated 8/25/16)	-	(3,851)	-	-
26 Total Energy Efficiency & Demand Side Program Costs	\$ 89,733,313	\$ 110,378,109	\$ 151,574,107	\$ 192,488,915
27 NC Allocation Factor for EE programs	72.9600473%	72.9564706%	73.0962827%	72.8087506%
28 NC Allocation Factor for DSM programs-Residential	34.0209980%	32.5218612%	33.7973480%	33.8075104%
29 NC Allocation Factor for DSM programs-Non-Residential	41.2108021%	42.4483655%	40.8166437%	40.0747013%
	NC Allocated - 12 Months Ended 12/31/2014	NC Allocated - 12 Months Ended 12/31/2015	NC Allocated - 12 Months Ended 12/31/2016	NC Allocated - 12 Months Ended 12/31/2017
30 Residential Energy Assessments	\$ 2,630,748	\$ 2,251,563	\$ 1,958,171	\$ 2,118,078
31 My Home Energy Report	6,044,788	7,183,217	7,910,805	10,056,526
32 Energy Efficient Appliances and Devices	10,752,946	8,791,608	17,594,110	22,090,705
33 Residential - Smart Saver Energy Efficiency Program	3,492,457	3,951,930	5,730,431	5,390,270
34 Appliance Recycle Program	1,105,977	1,121,517	(71,194)	3,864
35 Income Qualified Energy Efficiency and Weatherization Assistance	1,398,784	1,633,332	3,503,093	4,008,844
36 Multi family Energy Efficiency	1,052,473	1,526,931	1,841,287	2,306,888
37 Energy Efficiency Education	1,432,317	1,499,016	1,554,399	1,512,683
38 Nonresidential Smart Saver Custom Energy Assessments	1,063,900	481,819	1,487,003	1,558,016
39 Energy Management Information Systems	54,614	-	-	-
40 Non-Residential Smart Saver Custom	5,936,549	7,246,677	5,377,335	5,318,561
41 Non-Residential Smart Saver Performance Incentive	-	-	26,073	223,150
42 Non-Residential Energy Efficient Food Service Products	145,446	141,845	236,918	1,136,376
43 Non-Residential Smart Saver Energy Efficient HVAC Products	594,872	833,543	1,077,433	1,136,376
44 Non-Residential Smart Saver Energy Efficient Lighting Products	4,908,515	8,270,198	28,962,899	48,555,988
45 Nonresidential Energy Efficient Pumps and Drives Products	426,724	340,326	344,963	385,112
46 Nonresidential Energy Efficient ITEE	18,773	522,764	208,639	44,570
47 Nonresidential Energy Efficient Process Equipment Products	65,525	64,802	92,062	118,251
48 Smart Energy In Offices	843,781	1,067,528	776,084	648,734
49 Small Business Energy Saver	749,013	10,191,136	11,228,212	12,633,026
50 Business Energy Report	-	92,220	192,366	92,234
51 Power Manager	10,608,831	10,394,843	9,600,575	10,082,296
52 EnergyWise for Business	-	1,213,062	369,407	1,879,262
53 Power Share	12,850,841	12,354,553	11,225,091	10,072,077
54 Disallowed Costs from 2015 Program Costs Audit (Order E-7 Sub 1105, dated 8/25/16)	-	(2,887)	-	-
55 Total Energy Efficiency & Demand Side Program Costs	\$ 66,177,873	\$ 81,171,544	\$ 111,226,163	\$ 140,235,514

F/A

Duke Energy Carolinas, LLC
 January 2014 - December 2017 Actuals
 January 2018 - December 2019 Estimates
 Docket Number E-7, Sub 1164
 North Carolina Found Revenues

	Actual/ Reported KWH				Estimated KWH		Total
	2014	2015	2016	2017	2018	2019	
Economic Development	166,234,550	464,610,000	271,322,290	348,693,600	-	-	1,250,860,440
Plug-in Electric Charging Station Pilot	238,696	-	-	-	-	-	238,696
Lighting							
Residential	105,354	90,653	90,608	78,437	78,437	78,437	521,926
Non Residential (Regulated)	95,391	76,081	96,691	102,200	102,200	102,200	574,763
MV to LED Credit - Residential (Regulated)	(156,381)	(171,375)	(189,823)	(172,702)	(959,451)	(883,485)	(2,533,216)
MV to LED Credit - Non-Residential (Regulated)	(104,331)	(160,589)	(173,799)	(193,494)	(1,074,961)	(989,850)	(2,697,024)
Total KWH	166,413,279	464,444,770	271,145,967	348,508,041	(1,853,775)	(1,692,697)	1,246,965,585
Total KWH Included	(59,967)	(165,230)	(176,323)	(185,559)	(1,853,775)	(1,692,697)	(4,133,551)
Total KWH Included (net of Free Riders 15%)	(50,972)	(140,446)	(149,875)	(157,725)	(1,575,709)	(1,438,793)	(3,513,518)
Annualized Found Revenue - Non Residential	\$ (3,700)	\$ (37,868)	\$ (37,374)	\$ (47,610)	\$ (532,809)	\$ (486,191)	\$ (1,145,551)
Annualized Found Revenue - Residential	\$ (34,952)	\$ (55,340)	\$ (67,985)	\$ (63,990)	\$ (603,909)	\$ (551,837)	\$ (1,378,013)

Decision Tree Node

Box 5 - exclude
 Box 3 - exclude

Box 6 - include
 Box 6 - include
 Box 6 - include
 Box 6 - include

	2014	2015	2016	2017	2018	2019	Total
Vintage 2014 - Non Res	1,474	(3,700)	(3,700)	(5,174)			(11,099)
Vintage 2015 - Non Res		(21,561)	(37,868)	(37,868)	(8,995)		(106,292)
Vintage 2016 - Non Res			(19,617)	(37,374)	(12,458)	-	(69,449)
Vintage 2017 - Non Res				(19,367)	(47,610)	(47,610)	(114,587)
Vintage 2018 - Non Res					(288,605)	(532,809)	(821,413)
Vintage 2019 - Non Res						(263,353)	(263,353)
Net Negative Found Revenues to Zero*	-	25,261	61,185	99,784	357,668	843,772	1,387,669
Subtotal - Non Res	\$ 1,474	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,474
Vintage 2014 - Res	(12,947)	(34,952)	(34,952)	(22,005)	-		(104,857)
Vintage 2015 - Res		(32,355)	(55,340)	(55,340)	(12,367)	-	(155,402)
Vintage 2016 - Res			(38,231)	(67,985)	(22,662)	-	(128,878)
Vintage 2017 - Res				(26,863)	(63,990)	(63,990)	(154,842)
Vintage 2018 - Res					(327,118)	(603,909)	(931,027)
Vintage 2019 - Res						(298,912)	(298,912)
Net Negative Found Revenues to Zero*	12,947	67,307	128,523	172,193	426,136	966,811	1,773,918
Subtotal - Residential	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Found Revenues	\$ 1,474	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,474

* Eliminates the inclusion of total negative found revenues at the Residential and Non-Residential level

Duke Energy Carolinas
System Event Based Demand Response January 1, 2017 - December 31, 2017
Docket Number E-7, Sub 1164

Evans Exhibit 5

I/A

Date	State	Program Name	Event Trigger	High / Low System Temp (F)	Customers Notified /Switches Dispatched	MW Reduction
7/13/2017	NC and SC	Power Manager	Emergency, Low Reserves	92 / 78	208,330 / 248,954	220.5

Notes:

- The 'High / Low System Temperature' is the average of the daily high & low temperatures from 3 weather stations (Charlotte, Greensboro, Greenville/Spartanburg)
- 'Customers Notified' is the number of participants notified to participate in the event
- 'Switches Dispatched' values represent the monthly active switch counts
- 'MW Reduction' values are based on the average across all hours of the event
- A loss adjustment of 1.0622 has been included in the 'MW Reduction' values.

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Mar 07 2018

I/A

Duke Energy Carolinas, LLC – Executive Summary

* complete exhibit
is filed in
doctersystem

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Mar 07 2018

A. Description

During the first quarter 2018 Duke Energy Carolinas Collaborative meeting, Duke Energy Carolinas, LLC (the "Company") will provide an update on the performance of its energy efficiency and demand side management programs/pilots for the time frame of January 2017 through December 2017. The Company's product managers prepared reports on each program/pilot describing the offerings and detailing each program's performance. This Executive Summary describes how the Company performed in regards to the energy efficiency and demand side management program/pilot performance at an aggregate level during the full year of Vintage 2017 in comparison to as filed information. Program-specific details are provided in the individual reports.

Program reports include:

Program	Category	Customer
Appliance Recycling Program (Closed)	EE	Residential
Energy Assessments	EE	Residential
Energy Efficient Appliances and Devices	EE	Residential
Energy Efficiency Education Programs	EE	Residential
Residential – Smart Saver Energy Efficiency Program (HVAC EE)	EE	Residential
Income Qualified Energy Efficiency and Weatherization Assistance	EE	Residential
My Home Energy Report	EE	Residential
Multi-Family Energy Efficiency	EE	Residential
Business Energy Reports (Closed)	EE	Non-residential
Non-Residential Smart Saver Prescriptive	EE	Non-residential
Non-Residential Smart Saver Custom	EE	Non-residential
Non-Residential Smart Saver Custom Assessment	EE	Non-residential
Non-Residential Smart Saver Performance Incentive	EE	Non-residential
Small Business Energy Saver	EE	Non-residential
Smart Energy in Healthcare (Closed)	EE	Non-residential
Smart Energy in Offices (Scheduled for closure 06/30/2018)	EE	Non-residential
EnergyWise for Business	EE/DSM	Non-residential
Power Manager	DSM	Residential
PowerShare	DSM	Non-residential

Audience

All retail Duke Energy Carolinas customers who have not opted out.

B & C. Impacts, Participants and Expenses

The tables below include actual results for the full year of Vintage 2017 in comparison to as filed data for Vintage 2017.

The Company includes the number of units achieved and a percentage comparison to the as filed values. The unit of measure varies by measure as a participant, for example, may be a single LED bulb, a kW, a kWh, a household or a square foot. Due to the multiple measures in a given program or programs, units may appear skewed and are not easily comparable.

I/A

Duke Energy Carolinas, LLC
Estimate - January 1, 2019 - December 31, 2019
Docket Number E-7, Sub 1164
Projected Program/Portfolio Cost Effectiveness - Vintage 2019

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Program	UCT	TRC	RIM	PCT
Residential Programs				
• Energy Education Program for Schools	1.22	1.69	0.53	
• Energy Efficient Appliances & Devices	2.40	2.17	0.42	6.11
• HVAC EE Products & Services	0.94	0.59	0.45	1.52
• Income-Qualified EE Products & Services	0.19	0.83	0.16	
• Multi-Family EE Products & Services	2.82	4.71	0.59	
• My Home Energy Report	1.56	1.56	0.57	
• Power Manager	4.33	8.86	4.33	
• Residential Energy Assessments	1.41	1.55	0.54	
Residential Total	2.22	2.60	0.70	7.69
Non-Residential Programs				
• Custom Assessment / Incentive	2.35	1.04	0.67	2.12
• EnergyWise for Business	0.83	1.21	0.68	
• Food Service Products	2.68	1.95	0.61	3.18
• HVAC	2.04	1.63	0.88	1.82
• Lighting	3.48	1.44	0.74	2.17
• Motors, Pumps & VFDs	2.54	2.45	0.54	3.56
• Non Res Information Technology	2.36	1.77	0.59	3.79
• Process Equipment	2.13	2.23	0.47	4.21
• Performance Incentive	2.70	0.81	0.69	1.50
• Small Business Energy Saver	2.59	1.61	0.77	3.00
• Power Share	2.90	41.14	2.90	
Non-Residential Total	2.69	1.67	0.85	2.41
Overall Portfolio Total	2.46	1.98	0.78	3.48

Evans Exhibit 8

Evans Exhibit 8

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Duke Energy Carolinas, LLC
List of Industrial and Commercial Customers that have opted-out Vintage 2017
Docket No. E-7, Sub 1164

	Number of Accounts		
DSM RIDER OPT-OUT YR 2017	4,863		
EE RIDER OPT-OUT YR 2017	4,075		
	DSM YR17(1/1/17-12/31/17)	EE YR17(01/01/17-12/31/17)	
Customer Bill Name	RIDER OPT-OUT	RIDER OPT-OUT	Grand Total
A & T STATE UNIV	13	10	23
A W NORTH CAROLINA INC	6	6	12
ABERCROMBIE TEXTILES LLC		1	1
ABSS FACILITIES DEPT	7	7	14
AIR PRODUCTS & CHEMICALS, INC	1	1	2
ALDERSGATE	9	9	18
ALLIED DIE CASTING CO OF NC	2	2	4
ALLVAC, A DIVISION OF TDY INDUSTRIES, INC	1	1	2
AMERICAN & EFIRD LLC	8	9	17
AMERICAN FIBER & FINISHING	1	1	2
ANDALE INC	4	4	8
BALDOR ELECTRIC COMPANY	5	5	10
BANK OF AMERICA	5	3	8
BARNHARDT MANUFACTURING COMPANY INC	4		4
BASF CORPORATION	4	4	8
BB&T	8	7	15
BEMIS MANUFACTURING CO	3	3	6
BERRY TRI PLASTICS		1	1
BI-LO, LLC	21	21	42
BIOMERIEUX, INC	4	3	7
BISSELL COMPANIES	59	1	60
BISSELL GOLF	1		1
BISSELL HOTEL 6 LLC	1		1
BISSELL HOTELS 8, LLC	1		1
BONSET AMERICA CORP	1	1	2
BSN MEDICAL INC	1	1	2
BURLINGTON TECHNOLOGIES INC	4	4	8
CARAUSTAR INC	4	2	6
CARAUSTAR INDUSTRIES	3	2	5
CARGILL, INCORPORATED	4	4	8
CAROLINA CONTAINER	5	4	9
CAROLINA TRACTOR & EQUIPMENT COMPANY	4	4	8
CASE FARMS	3	3	6
CASTLE & COOKE NORTH CAROLINA LLC	4	4	8
CATAWBA COLLEGE	1		1
CATAWBA VALLEY MEDICAL CENTER	1	1	2
CATERPILLAR	1	1	2
CERTAINTED CORP	1	3	4
CHARLOTTE LATIN SCHOOLS, INC	13	13	26
CHARLOTTE OBSERVER PUBLISHING COMPANY	1	1	2
CHARLOTTE PIPE & FOUNDRY	14	14	28
CITY OF CHARLOTTE	87	101	188
CITY OF DURHAM	4	4	8
CITY OF WINSTON SALEM	24	29	53
CLEMENT PAPPAS NC, INC	4	3	7
CLEVELAND COUNTY SCHOOLS	61	25	86
CMBE	184		184
COATS AMERICAN	2	2	4
COLONIAL PIPELINE		5	5
COMMONWEALTH BRANDS	2	2	4
COMMSCOPE, INC.	10	10	20
CORMETECH INC	1	1	2
CORNING CABLE SYSTEMS	5	5	10
CORNING INC	6	6	12
CPCC	45	36	81
CREE INC	11	11	22
CSHV SOUTHPARK 6100 FAIRVIEW, LLC	1	1	2
CULP INC	1	1	2
DAVIDSON COLLEGE	15	15	30
DUKE UNIVERSITY	12	12	24
DURHAM COUNTY GOVERNMENT	2	2	4
DURHAM COUNTY HOSPITAL CORPORATION	1	1	2
E I DUPONT CO	1	1	2
EASTERN BAND OF CHEROKEE INDIANS	6	6	12
ELON UNIVERSITY	69	69	138
EMC CORPORATION	2	2	4

Mar 07 2018

Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
FERGUSON SUPPLY & BOX	1	1	2
FLEXTRONICS AMERICA, LLC	3	3	6
FOOD LION	226	180	406
FRONTIER SPINNING MILLS, INC		2	2
FURNITURELAND SOUTH	8	8	16
GARDNER WEBB UNIV	1	1	2
GBORO NEWS & RECORD	2	2	4
GENERAL ELECTRIC	2	2	4
GERDAU AMERISTEEL US INC	2	2	4
GLEN RAVEN INC	2	1	3
GUILFORD COUNTY SCHOOLS	243	238	481
GUILFORD TECH COMM COLL	17	17	34
HANSON BRICK EAST LLC	3	3	6
HARRIS TEETER INC	65	15	80
HENDERSON COUNTY SCHOOLS	14	15	29
HENKEL CORPORATION	6	6	12
HICKORY CITY SCHOOLS	13	13	26
HIGHWOODS PROPERTIES	51	51	102
HIGHWOODS REALTY LIMITED PARTNERSHIP	1	1	2
HIGHWOODS REALTY LTP	1	1	2
HONDA POWER EQUIPMENT	1	1	2
IBM CORPORATION	1	1	2
INGLES MARKETS, INC.	58	58	116
INGREDION INCORPORATED	1	1	2
INTERNATIONAL TEXTILE GROUP INC	1	2	3
JACKSON PAPER MFG CO	1	1	2
JPS COMPOSITE MATERIALS CORP		1	1
KAYSER ROTH CORPORATION	2	2	4
KEATING GRAVURE USA, LLC	1	1	2
KIMBERLY CLARK	5	5	10
KINDER MORGAN SOUTHEAST TERMINAL	3	3	6
KINDER MORGAN TRANSMIX GROUP	1	1	2
KROGER CO	5	5	10
KROGER LIMITED PARTNERSHIP I	1	1	2
L B PLASTICS INC	6	6	12
L S STARRETT CO	1	3	4
LINDE LLC	1	1	2
LOUISIANA-PACIFIC CORPORATION	1	1	2
LOWES FOODS	46	39	85
MARTIN MARIETTA MATERIALS INC	69	72	141
MAUSER CORP		4	4
MECK CNTY JAIL CENTRAL	1	1	2
MECKLENBURG COUNTY	19	2	21
MERITOR HEAVY VEHICLE SYSTEMS	1	1	2
MICHELIN AIRCRAFT TIRE CO	1	1	2
MICHELIN NORTH AMERICA	10	10	20
MILLERCOORS LLC	1	1	2
MILLIKEN & COMPANY	2	2	4
MOM BRANDS COMPANY	1	1	2
MOUNT VERNON MILLS INC	1	1	2
NATIONAL PIPE & PLASTICS	2	2	4
NC CENTER FOR PUBLIC TV	7	8	15
NEW GENERATION YARNS		1	1
NGK CERAMICS USA	2	2	4
NORTHROP GRUMMAN GUIDANCE & ELECTRONICS COMPANY, INC	2	2	4
NOVANT HEALTH INC	18	18	36
O'MARA, INC.	1	1	2
OMNISOURCE SOUTHEAST	5	10	15
ORACLE FLEXIBLE PACKAGING	5	5	10
OWENS ILLINOIS, INC	2	2	4
PARKDALE AMERICA LLC	9	9	18
PARKDALE MILLS, INC	2	3	5
PARTON LUMBER CO	6	8	14
PERFORMANCE FIBERS OPERATIONS INC	5	5	10
PHARR YARNS, LLC	4	4	8
PINE HALL BRICK COMPANY, INC	2	2	4
PLANTATION PIPE LINE	3	3	6
POLYMER GROUP, INC	1	1	2
PPG INDUSTRIES INC	2	2	4
PRESBYTERIAN HOSPITAL	9	9	18
R F MICRO DEVICES	3	3	6
RJ REYNOLDS TOBACCO CO	5	5	10
ROCKINGHAM COMM COLLEGE	1	1	2

Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
ROWAN SALISBURY SCHOOLS	5		5
RUTHERFORD COUNTY SCHOOLS	3	2	5
SANS TECHNICAL FIBERS, LLC	4	4	8
SCHAEFER SYSTEMS	8		8
SCHNEIDER MILLS, INC	1	1	2
SCM METAL PRODUCTS INC	3	3	6
SEALED AIR CORPORATION	3	3	6
SHAMROCK CORPORATION	4		4
SHAW INDUSTRIES GROUP, INC	8	8	16
SHURTAPE TECHNOLOGIES	7	7	14
SOUTH GRANVILLE WATER AND SEWER AUTHORITY	3	3	6
SUMITOMO ELECTRIC ESC, INC	1	1	2
SYNGENTA BIOTECHNOLOGY INC	1	1	2
THE LINCOLN NATIONAL LIFE INSURANCE COMPANY	2	1	3
THE TIMKEN COMPANY	3	3	6
TRELLEBORG COATED SYSTEMS US, INC	1	1	2
TROPICAL NUT & FRUIT CO	1	1	2
UNC - CHAPEL HILL	12	12	24
UNC GREENSBORO	24	24	48
UNCC	17	17	34
UNIFI INC	1	1	2
UNIFI MANUFACTURING, INC	3	5	8
UNILIN FLOORING NC LLC	4	4	8
UNITED STATES COLD STORAGE	1	1	2
UNIVERSAL FOREST PRODUCTS	2	2	4
UPM - RAFLATAC, INC	1	1	2
VULCAN CONSTRUCTION MATERIALS, LP	50	49	99
W S FORSYTH COUNTY SCHOOLS	94	88	182
WATTS REGULATOR COMPANY	7	7	14
WAYNE FARMS LLC	8	8	16
WBTB LLC	2	2	4
WELLS FARGO BANK NA	8	4	12
WESTERN CAROLINA UNIVERSITY	1	1	2
WIELAND COPPER PRODUCTS LLC	1	1	2
WINGATE UNIVERSITY	20	20	40
ZINK IMAGING INC	1		1
PACTIV LLC		3	3
HORSEHEAD CORPORATION	1	1	2
KENDRION-SHELBY	2	2	4
DOOSAN INFRACORE PORTABLE POWER - A DIVISION OF CLARKE EQUIPMENT	2	2	4
APPLE INC	1	1	2
CONSOLIDATED METCO INC		1	1
TRIBAL CASINO GAMING ENTERPRISES HARRAH'S CASINO & HOTEL	1		1
WAL-MART STORES EAST,LP	84	83	167
CBL ASSOCIATES MANAGEMENT, INC	1	1	2
REGAL CINEMAS INC	5	5	10
SAMS EAST INC	19	19	38
TARGET STORES	23	6	29
UNITED PARCEL SERV	2	2	4
GLAXOSMITHKLINE LLC	4	4	8
SGL CARBON, LLC	1	1	2
TRANSYLVANIA COUNTY SCHOOLS	11	11	22
MERCK SHARP & DOHME CORP	4	4	8
SOUTHWESTERN COMMUNITY COLLEGE	12	12	24
KYOCERA INDUSTRIAL	1	1	2
TRANSYLVANIA COMMUNITY HOSPITAL	1		1
POLK COUNTY SCHOOLS	6		12
EAST DECK INC	1	1	2
CHAPEL HILL/ CARRBORO SCHO	64		64
BISSELL HOTELS #7, LLC	1		1
CINEBARRE, LLC	2	2	4
COSTCO WHOLESALE INC	5	5	10
LOWES OF FRANKLIN #717	2	2	4
SAPA BURLINGTON LLC	3		3
CAROLINAS HEALTHCARE SYSTEM	21		21
CONTINENTAL AUTOMOTIVE SYSTEMS, INC	2	2	4
CAPITAL BROADCASTING COMPANY	8	8	16
GE LIGHTING SOLUTIONS LLC	6	6	12
CITY OF GREENSBORO	26	28	54
GUILFORD COLLEGE	42	30	72
KOURY CORPORATION	53	53	106
CHEMTURA CORPORATION	1	1	2
LOWE'S HOME CENTERS, INC	90	89	179

Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
BOYLE BUILDING, LLC	1		1
NC OWNER LLC	8		8
KOURY VENTURES	5	5	10
PARDEE MEMORIAL HOSPITAL	7	7	14
MCMICHAEL MILLS INC	3	3	6
US FOODS, INC	1	1	2
ROUNDPOINT FINANCIAL GROUP	1		1
CMC-NORTHEAST INC	9		9
SECURITY NATIONAL PROPERTIES HOLDINGS LLC	15		15
NCFLA II OWNER LLC	3		3
THE GC NET LEASE (CHARLOTTE) INVESTORS LLC	1		1
BJ'S WHOLESALE CLUB	3	3	6
BELLSOUTH	9	7	16
CITY OF HENDERSONVILLE	4	4	8
NEW SOUTH LUMBER COMPANY INC	3	3	6
RALPH LAUREN CORPORATION	3	3	6
BREVARD COLLEGE	19	19	38
CMHA	5		5
PARK RIDGE HOSPITAL	8	9	17
PET DAIRY	2	2	4
JACKSON BOE	7	7	14
PBM GRAPHICS INC	5	5	10
STEFANO FOODS	3	3	6
PROCTER & GAMBLE MANUFACTURING COMPANY	6	6	12
LOWE'S OF FRANKLIN #717	1	1	2
AT&T BELLSOUTH	3	3	6
BISSELL CO	4		4
BELLSOUTH COMMUNICATIONS, LLC	1	1	2
GILDAN ACTIVE WEAR INC	3		3
ARMACELL LLC	8	6	14
LYDALL THERMAL ACOUSTICAL INC	4	1	5
PAPER STOCK DEALERS	1	1	2
200 NORTH COLLEGE CHARLOTTE LLC	1		1
ING CLARION REALTY SERVICES LLC	1		1
THE DAVID H MURDOCK CORE LABORATORY BUILDING OWNERS ASSOCIATION, INC.	1	1	2
HENDERSON COUNTY GOVERNMENT	3	4	7
CENTURY FURNITURE, LLC	7	12	19
QUALICAPS INC	3	3	6
NORDSTROM INC	2	1	3
NORFOLK SOUTHERN	3	3	6
301 S MCDOWELL STREET HOLDING LLC	1		1
HANES COMPANIES INC	2	2	4
FIRESTONE FIBERS & TEXTILES COMPANY, LLC	2		2
THE NC A&T UNIVERSITY	1	1	2
CHEROKEE INDIAN HOSPITAL	1	1	2
SELEE CORP	2	2	4
STAR PAPER TUBE INC	1		1
CAROLINA YARN	2	2	4
GOLF CLUB AT BALLANTYNE RESORT	2		2
CITY OF BURLINGTON	5	3	8
BAY STATE MILLING	4	4	8
SWAIN COUNTY SCHOOLS	6		6
TIMKENSTEEL CORPORATION	1	1	2
PARKWAY 214 N TRYON LLC	1		1
CENTURION MOREHEAD LLC	1		1
FLINT TRADING CO	2	2	4
GENPAK LLC	3	3	6
RUTHERFORD HOSPITAL INC	6	6	12
RITE AID CORPORATION	1	1	2
PLYCEM USA, INC	1	1	2
DALCO NONWOVENS, LLC	2	2	4
BELLSOUTH BSC	13	7	20
HINES GLOBAL REIT HOCK PLAZA I LLC	1	1	2
BOYLE BUILDING, LLC	1		1
BLUE RIDGE COMMUNITY COLLEGE	17	15	32
BERNHARDT FURNITURE COMPANY	8	6	14
GILDAN YARNS, LLC		1	1
MERITOR HEAVY VEHICLE SYSTEMS LLC	1	1	2
SIERRA NEVADA BREWING CO	1	1	2
AMERICAN TOBACCO POWER HOUSE LLC	2	2	4
GALENOR DESIGNS, LLC	1	1	2
BELL SOUTH MOBILITY	1	1	2
JOHNSON CONTROLS BATTERY GROUP, INC	1	1	2

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BISSELL DEVELOPMENT	1		1
CAROLINA PERLITE CO	1	1	2
SUNSET HILL INVESTMENTS LLC	1	1	2
DIAMOND VIEW II	2	2	4
DAIRY FRESH	3	3	6
PITTSBURGH GLASS WORKS LLC	1	1	2
OPTICAL EXPERTS MANUFACTURING	1	1	2
ENGINEERED CONTROLS INTERNATIONAL INC	4	4	8
THE NC AT UNIVERSITY A&T FOUNDATION LLC	1	1	2
WINSTON TOWER MAIN LLC	1	1	2
FRITO-LAY, INC	1	1	2
WINDWARD PRINT STAR INC	1	1	2
ALCAN PACKAGING FOOD AND TOBACCO, INC	2	2	4
GASTON COLLEGE	7	6	13
PARKWAY 550 SOUTH CALDWELL LLC	1		1
CAMFIL USA INC	2	2	4
CAROLINA VILLAGE	4	4	8
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT	1		1
DIAMOND VIEW I LLC	2	2	4
HITACHI METALS NC LTD	1	1	2
AT&T MOBILITY LLC	4	3	7
TEAM INDUSTRIES	1	1	2
HERITAGE HOME GROUP LLC	3	6	9
MANUAL WOODWORKERS & WEAVERS INC	2	2	4
BLUE RIDGE HEALTH CARE	1		1
T5@KINGS MOUNTAIN II, LLC	1	1	2
DISNEY WORLDWIDE SERVICES INC	1	1	2
BAKER FURNITURE COMPANY	9	9	18
AMERICAN CAMPUS LLC	1	1	2
ALEXANDER COUNTY SCHOOLS	2	2	4
SONOCO CRELLIN INC	2	2	4
LEXINGTON FURNITURE IND	2	2	4
WEYERHAEUSER COMPANY	1		1
ELASTIC FABRICS OF AMERICA	2	1	3
SALISBURY MACHINERY	1	1	2
MCDOWELL HOSPITAL INC	1		1
BISSELL HOTELS 5 LLC	1		1
CARLISLE FOOD SERVIC	1	1	2
PRINTPACK INC	1	1	2
PINE NEEDLE LNG COMPANY	1	1	2
VALASSIS COMMUNICATIONS	1	1	2
MOORE WALLACE NORTH AMERICA INC	1	1	2
CARDINAL FLOAT GLASS	1	1	2
CITY OF ASHEVILLE	1	2	3
GLEN HIGH SCHOOL	1	1	2
JOHNSON CONTROLS INC	2		2
MODERN DENSIFYING		2	2
COCA COLA BOTTLING CO CON	5	5	10
HALLYARD NORTH CAROLINA, INC		1	1
NEW EXCELSIOR, INC		1	1
RITZ CARLTON CHARLOTTE	1	1	2
CITY OF HICKORY	4	4	8
COPLAND FABRICS INC		1	1
CITY OF KANNAPOLIS		1	1
CHESAPEAKE TREATMENT COMPANY, LLC	1	1	2
AT&T WIRELESS SERVICE	1	1	2
PRECOR MANUFACTURING LLC	1	1	2
CHARLOTTE COUNTRY DAY SCHOOL	12		12
ALADDIN MANUFACTURING CORPORATION		2	2
PARKER HANNIFIN CORPORATION	10	8	18
FREUDENBERG IT LP	4	4	8
SHERATON IMPERIAL	3	3	6
THE CYPRESS OF CHARLOTTE CLUB, INC	11	11	22
MAGNOLIA CASTLE LLC	1	1	2
WAKE FOREST UNIVERSITY	4	3	7
AFFILIATED COMPUTER SERVICE	3	3	6
CLARIANT CORPORATION	11	10	21
CELGARD, LLC	5	5	10
VERIZON WIRELESS	5	5	10
TRANSCONTINENTAL GAS	2	3	5
TAYLOR KING FURNITUR	2	1	3
CHEROKEE BOYS CLUB	3	3	6
LIGGETT GROUP INC	1		1

Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
KOHLER COMPANY	1	1	2
CEDAR FAIR SOUTHWEST, INC	3	3	6
DAIMLER TRUCKS NORTH AMERICA, LLC	5	5	10
TIME WARNER CABLE, INC.	1	1	2
VALDESE WEAVERS	6	6	12
SOUTHERN METALS CO	7	3	10
JDL CASTLE CORP	1	1	2
BESTCO	4	4	8
THE NC OFFICE OF INFORMATION TECHNOLOGY SERVICES	3	3	6
IPEX USA, INC	2	1	3
MANNINGTON WOOD FLOORS	1		1
GASTON CO SCHOOLS	38	36	74
FORESTVIEW HIGH SCHOOL PTA	1		1
CK THREE TOWER CENTER,LLC	1	1	2
ITG BRANDS LLC	2	2	4
NC BAPTIST HOSPITAL	9	8	17
WAKE FOREST UNIVERSITY HEALTH SCIENCES	11	10	21
SENTINEL NC-1,LLC	3	3	6
DYNAYARN USA, L.L.C.	1	1	2
JAMES M PLEASANTS CO	1		1
PEPSI BOTTLING VENTURES, LLC	5	5	10
GENUINE PARTS COMPANY	2		2
BESTREADS INC	2	2	4
RD AMERICA LLC	1	1	2
PERMA TECH INC	1	1	2
BANK NOTE CORP	3	3	6
HICKORY SPRINGS MANUFACTURING COMPANY.	22	25	47
CALICO TECHNOLOGIES INC	3	3	6
TRIAD HOSPITALITY CORPORATION	1		1
STIEFEL LABORATORIES INC	3	3	6
E J VICTOR INC	1	1	2
BRIGHT ENTERPRISES INC	2	2	4
GRAY MANUFACTURING TECHNOLOGIES LLC	2	2	4
MCCREARY MODERN INC	8	6	14
CLEARWATER PAPER CORPORATION	4	4	8
CONOVER LUMBER CO	2	2	4
JOWAT CORPORATION	6	6	12
HUNTSMAN INTERNATIONAL LLC	2	2	4
ABCO AUTOMATION INC	1	1	2
ALEXANDER FABRICS, INC	2	2	4
MARVES INDUSTRIES, LLC	1	1	2
GRIFFIN INDUSTRIES	2	2	4
AMERICAN CONVERTING, CO. LTD	2	2	4
MEREDITH WEBB PRINT	4	4	8
BAKERY FEEDS INC	2	2	4
ECMD INC	4	4	8
TECHNIMARK INC	14	14	28
JOHNSTON PROP INC	1	2	3
IQE INC	2	2	4
BEVERLY KNITS INC	5	5	10
CHILDRENS HOME INC	2	2	4
TRIAD WINDOW DES & I	1	1	2
HENDERSONVILLE HEALTH & REHAB	1	1	2
STEWART SUPERABSORBENTS, LLC	1	1	2
FILTRONA GREENSBORO, INC	3	3	6
CAROLINA BEVERAGE GROUP, LLC	4	4	8
THOMAS BUILT BUSES	4	4	8
METROMONT CORPORATION	2	2	4
BALLANTYNE RESORT, LLC	1		1
CIM URBAN REIT PROPERTIES VIII LP	1		1
BOXBOARD PROD INC	2	2	4
ADVANCED TECHNOLOGY	2	2	4
SYNTHETICS FINISHING	10	10	20
CABARRUS COUNTY SCHOOLS	63	63	126
BIC CORPORATION	5	5	10
ADVANCED MACHINE & FABRICATION, INC.	2	2	4
FAIRSTONE FABRICS	4	4	8
CLAPPS NURSING HOME CENTER	1	1	2
FOCKE & CO, INC	1	1	2
AQUA PLASTICS INC	2	2	4
MEDIA GENERAL OPERATIONS INC	1	1	2
STONEVILLE LUMBER CO	2	2	4
VALSPAR CORP	3	3	6

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Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
VANGUARD FURNITURE INC	8	8	16
NETAPP, INC	2	2	4
OAK FOREST HEALTH AND REHABILITATION CO	1	1	2
STAMPSOURCE	1	1	2
J E HERNDON CO	1	1	2
MILES TALBOTT	2	2	4
STONEFIELD CELLARS WINERY LLC	1	1	2
KOOPMAN DAIRIES INC	2	2	4
NC BLUMENTHAL PAC	2	2	4
ONEAL STEEL INC	4	4	8
COLUMBIA PLYWOOD CORPORATION	7	7	14
INFO-GEL, LLC	3	3	6
AMERICAN YARNS LLC	3	3	6
DAVIDSON COUNTY COMMUNITY COLLEGE	3	3	6
MORTON CUSTOM PLASTICS, LLC	2	2	4
CISCO SYSTEMS INC	1	1	2
INCHEM CORPORATION	2	2	4
FMC-LITHIUM CORP	5	5	10
TECHNIBILT LTD	3	3	6
EAST COAST LUMBER CO	1	1	2
INDUSTRIAL WOOD PRODUCTS	3	2	5
INDUSTRIAL WOOD PROD	3	3	6
KINCAID FURNITURE	13	13	26
HERBALIFE INTERNATIONAL OF AMERICA INC	1	1	2
SNIDER TIRE, INC	2	2	4
DISCOVERY PLACE INC	2	2	4
CAMBRIDGE CC HOLDING COMPANY LLC	1		1
TOWN OF VALDESE	3	1	4
SHUFORD YARNS, LLC	2	2	4
MINT MUSEUM OF CRAFT & DESIGN	1	1	2
KEN SMITH YARN CO	1	1	2
FIBER & YARN PRODUCTS, INC	1	2	3
AMERICAN EXPRESS TRAVEL RELATED SERVICES COMPANY, INC	1	1	2
ESSENTRA PACKAGING US, INC		4	4
BRASS CRAFT MFG CO		1	1
HAN FENG INC		1	1
IGM RESINS USA INC		1	1
TOWN OF MOORESVILLE		1	1
TERRA-MULCH PRODUCTS, LLC	3	4	7
AMERICAN CAMPUS OPERATING CO LLC	3	3	6
ISOTHERMAL COMMUNITY COLLEGE	5	5	10
NC A&T UNIV FOUNDATION	1	1	2
TIME WARNER CABLE SE LLC	15	15	30
KSM CASTINGS USA INC	1		1
KERRS HICKORY READY MIXED CONCRETE COMPANY INC	3	3	6
U.S. COTTON, LLC	4	4	8
DANNY TERRELL	2	2	4
CKS PACKAGING INC	4	4	8
PIONEER COMMUNITY HOSPITAL OF STOKES	1		1
FREUDENBERG PERFORMANCE MATERIALS LP	3	2	5
CATAWBA COUNTY SCHOOLS	23	20	43
CITY OF CHARLOTTE REGIONAL VISITORS AUTHORITY	4	4	8
ELDER HOSIERY MILLS INC	1	1	2
AMERICAN TOBACCO HH LLC	6	6	12
DURHAM ACADEMY	7	7	14
CITY OF BELMONT	1	1	2
BECO MANAGEMENT	2	2	4
BRIT CHARLOTTE LLC	1	1	2
BRIT-CHARLOTTE HOLDING LLC	3	3	6
ST LUKES HOSPITAL	1		1
UNIVERSITY OF NC HOSPITALS	7	7	14
INSTEEL INDUSTRIES, INC	2	2	4
DURHAM PUBLIC SCHLS	107		107
ROGER MARK PENDLETON	4	4	8
CITY OF SALISBURY	10	10	20
DURHAM TECH COMM COL	2		2
AE & T COMPANY INC	1	1	2
IAC OLD FORT, LLC	3	3	6
IAC OLD FORT II LLC	1		1
SIEMENS ENERGY, INC	2	2	4
MDI MANAGEMENT	1		1
PRESBYTERIAN MEDICAL CARE CORP	1	1	2
GEORGIA-PACIFIC MT HOLLY LLC	1	1	2

Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
BROAD RIVER WATER AUTHORITY	1		1
TOSAF USA, INC	1	1	2
GKN DRIVELINE NORTH AMERICA, INC	1	1	2
CONSOLIDATED CONTAINER COMPANY	4	7	11
CONRAD HILL FEED &	1	1	2
LIDL US OPERATIONS LLC	1	1	2
BARTIMAEUS BY DESIGN INC	3	3	6
DURHAM FALCON HOTEL, LLC	1	1	2
CAROLINA GLOVE COMPANY	6	5	11
CAREFUSION MANUFACTURING, LLC	1	1	2
PLASTIC REVOLUTIONS	1	1	2
PACKRITE LLC	7	7	14
WAGER,ROBERT CO,INC	4	4	8
CAROLINA PRECISION COMPONENTS, INC.	1	1	2
MARKET AMERICA	3	3	6
LINCOLN COMM HEALTH	1	1	2
DAVIS AMBULATORY SURGICAL CENTER	1	1	2
IMAGES OF AMERICA	2	2	4
RENWOOD MILLS LLC	1	1	2
LEESONA CORP	1	1	2
INTELLIGENT IMPLANT SYSTEMS	1	1	2
JACKSON CREEK MFG INC	1	1	2
TELERX MARKETING INC	1	1	2
UNION COUNTY PUBLIC SCHOOLS	2	2	4
TKC MANAGEMENT SERVICES	1	1	2
STANDARD TOOLS AND EQUIPMENT	2	2	4
SOUTHERN PRECISION SPRING CO INC	2	2	4
ATRIUM WINDOWS & DOORS	7	7	14
BELK	7		7
SOUTHERN FURNITURE	4	4	8
SPORTS SOLUTIONS INC	2	2	4
BED,BATH & BEYOND	1	1	2
GREENSBORO COLLEGE	13	13	26
EARTH FARE INC	3	3	6
W&G ASSOCIATES	1	1	2
PEAK 10 INC.	2	2	4
CKA LAKEPOINTE TWO OWNER LLC	1	1	2
CKA LAKEPOINTE ONE OWNER LLC	1	1	2
CITY OF REIDSVILLE	2	2	4
SOCIAL SECURITY ADMINISTRATION	1	1	2
KURZ TRANSFER PRODUCTS LP	4	4	8
CARPENTER COMPANY	4	4	8
KEYSTONE FOODS LLC	2	2	4
AFRO AMERICAN CULTUR	1	1	2
EVANS,JAMES R	2	2	4
BEAL MANUFACTURING CORP	1	1	2
INSTITUTION FOOD HOUSE, INC	7	7	14
B/E AEROSPACE, INC	15	15	30
NATIONAL GYPSUM CO	1	1	2
SPORTS MENAGERIE	2	2	4
DIZE COMPANY	3	3	6
PHARR YARNS LLC	1	1	2
DIZE AWNING TENT CO	1	1	2
ECOFLO INC	3	3	6
GLOBAL TEXTILE ALLIANCE INC	5	5	10
EXOPACK-THOMASVILLE, LLC	6	6	12
COVERIS ADVANCED COATINGS US LLC	5	5	10
CARDINAL HEALTH 200, LLC	1	1	2
VIC INC	1	1	2
FOSS AUTO RECYCLING INC	5	5	10
CAROLINA PRECISION PLASTICS LLC	6	6	12
DEERE HITACHI CONST MACH	16	16	32
CONCRETE SUPPLY	3	3	6
CONCRETE SUPPLY CO	7	7	14
CONCRETE SUPPLY COMPANY LLC	1	1	2
PEAK RESOURCES-ALAMANCE, INC	2	2	4
WORLD MEDIA ENTERPRISES, INC	1	1	2
PUBLIX NORTH CAROLINA LP	8	8	16
GRASS AMERICA INC	4		4
NIAGARA BOTTLING LLC	1	1	2
CENTRAL CAROLINA PRODUCTS	1	1	2
CENTRAL CAROLINA PLASTICS INC	2	2	4
FORSYTH TECHNICAL COLLEGE	13	8	21

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Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
GATEWAY UNIVERSITY RESEARCH PARK	4	4	8
GRANDEUR MFG	1	1	2
METROLINA GREENHOUSES INC	20	18	38
BURLINGTON COAT FACTORY	4		4
BURKE COUNTY SCHOOLS	27	22	49
CARMEL COUNTRY CLUB	25	25	50
HOME DEPOT	18	18	36
CARMEL CTRY CLUB	1	1	2
WINSTON SALEM STATE UNIVERSITY	21	21	42
REYNOLDA MANUFACTURING SOLUTIONS, INC	4	4	8
REMATTR, INC	2	2	4
FUJITSU AMERICA INC	1	1	2
CPP INTERNATIONAL LLC	1	1	2
WSOC TELEVISION INC	4	2	6
SHERRILL FURNITURE	4	5	9
CV PRODUCTS CONSOLIDATED LLC	2	2	4
CITY OF GRAHAM	2	2	4
GOLDING FARMS FOODS	2	2	4
PERFORMANCE LIVESTOCK & FEED CO, INC.	1	1	2
BORAL BRICKS INC	1	1	2
UNC SCHOOL OF THE ARTS	34	34	68
CARMIKE CINEMAS, INC	4	4	8
ALLTEL MOBILE	1	1	2
SOUTH COLLEGE STREET LLC	1	1	2
AMERICAN ROLLER BEARING CO OF NC	1	1	2
AMERICAN ROLLER BEARING	1	1	2
SOUTHERN PIPE INC	1	1	2
POLY PLASTIC PRODUCTS OF NC INC	4	4	8
SPRINT	1	1	2
CAROLINA LASER CUTTING INC	1	1	2
CARDINAL HEALTH INC	2	2	4
CARDINAL HEALTH	1	1	2
ITL LLC	2	2	4
U S POSTAL SERVICE	5	5	10
CAROLINA SUNROCK CORP	10	10	20
AMERICAN AIRLINES	6	3	9
DURHAM COCA COLA	4	4	8
TURBOCOATING CORP	1	1	2
301 COLLEGE STREET CENTER LLC	1	1	2
AVAGO TECHNOLOGIES WIRELESS(USA) MANUFACTURING, INC	1	1	2
MULTI SHIFTER INC	1	1	2
PIONEER DIVERSITIES CO	1	1	2
WXII TELEVISION	2	1	3
SONESTA INTERNATIONAL HOTELS CORPORATION	1		1
AMSTAR SUGAR CORP	1	1	2
ATLANTIC SWEETNER CO	2	2	4
YMCA GREENSBORO	7	7	14
JAMESTOWN YMCA	1	1	2
TJX COMPANIES	3	3	6
GRIFOLS THERAPEUTICS INC	1	1	2
STEEL SPECIALTIES	2	2	4
RONNIE D MILES	1	1	2
JOHNSON & WALES UNIVERSITY	3	3	6
PIERRE FOODS	7	7	14
NORDIC WAREHOUSE INC	1	1	2
TIERPOINT, LLC	4	4	8
MERCHANTS DISTRIBUTORS INC	2	2	4
ALAMANCE REGIONAL MEDICAL CENTER	2	2	4
FAMILY DOLLAR STORES OF NORTH CAROLINA INC	4	4	8
INDEPENDENT BEVERAGE CORPORATION	4	4	8
FULLSTEAM BREWERY, LLC	1		1
NORANDAL USA INC	1	1	2
IMC-METALSAMERICA, LLC	1	1	2
PRYSMIAN CABLE AND SYSTEMS USA, LLC		1	1
MORINAGA AMERICA FOODS INC		1	1
ASHLEY FURNITURE INDUSTRIES INC	5	5	10
ELECTRIC GLASS FIBER AMERICA,LLC	3	4	7
INTERNATIONAL PAPER COMPANY	6	5	11
LENOVO (UNITED STATES) INC	1	1	2
SYNGENTA CROP PROTECTION, LLC	1		1
TE CONNECTIVITY CORPORATION	18	18	36
SONOCO CORRFLEX D & P LLC	3	3	6
ROCK-TENN CONVERTING COMPANY	28	28	56

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Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
WESTROCK CONVERTING COMPANY	1	1	2
SPENCERS INCORPORATED OF MOUNT AIRY, NC	1		1
SOUTH FORK INDUSTRIES	4	4	8
BRAXTON SAWMILL INC	3	3	6
ETHAN ALLEN OPERATIONS INC	2	2	4
SIEMENS ENERGY INC	2	3	5
ALEVO MANUFACTURING, INC.	19	19	38
B & E WOODTURNING INC	1	1	2
BARRDAY CORP	3	3	6
PRECISION FABRICS GROUP INC	2	2	4
THE INSPIRATIONAL NETWORK INC	2	2	4
LSC COMMUNICATIONS US, LLC	5	5	10
BENJAMIN THOMAS COOPER		1	1
MOORESVILLE ICE CREAM COMPANY LLC	2	2	4
QORVO US INC	4	3	7
QORVO US, INC	1	1	2
CITY OF WINSTON -SALEM	1	1	2
ALEVO MANUFACTURING, INC	1	1	2
PARMER RTP, LLC	3	3	6
LINDYS HOMEMADE, LLC	1	1	2
AMERICAN ZINC PRODUCTS LLC	1	1	2
UNILIN NORTH AMERICA, LLC	1	1	2
FIBRIX, LLC	2	2	4
ARIOBEX AMERICA	2		2
CANDLE CORPORATION OF AMERICA	2	2	4
COVERIS FLEXIBLES (THOMASVILLE) US LLC	6	6	12
COUSINS PROPERTIES LP	4	3	7
COMMONWEALTH HOSIERY	3	3	6
CHARLOTTE GATEWAY VILLAGE	2	2	4
TAYLOR BROS	6	6	12
THIEMAN MANUFACTURING TECHNOLOGIES LLC	1	1	2
PRESBYTERIAN HOMES, INC	9	8	17
SANDY RDG GOLF CLUB	3	3	6
FFNC INC	5	4	9
CAMCO MANUFACTURING, INC	5	5	10
GUILFORD COUNTY	8	7	15
CAROLINA INVESTMENT PROPERTIES	1	1	2
BRF-A1, LLC	1	1	2
REPLACEMENTS LTD	7	7	14
LIBERTY HARDWARE	3	1	4
EDS PALLET WORLD INC	4	4	8
LAKE HICKORY COUNTRY CLUB	6	6	12
LABELTECH INCORPORATED	2	2	4
HUITT MILLS, INC	2	2	4
CROWN CONVERTING	4	4	8
PIEDMONT CHEMICAL	2	2	4
TRIANGLE ORTHOPEDIC	1	1	2
CB RICHARD ELLI	12	12	24
LEE INDUSTRIES	3	3	6
COUSINS PROP INC	1	1	2
OWENS & MINOR MEDICA	1	1	2
STURM RUGER & CO INC	2	2	4
ELLIS LUMBER CO	3	2	5
SPECIALTY MANUFACTURING INC	1	1	2
DILLARDS DEPARTMENT STORE	5	3	8
SPECIALIZED PACKAGING FLEXO	1	1	2
MERIDIAN HOSPITALITY HOLDINGS LLC	1	1	2
LIBERTY HEALTHCARE PROPERTIES OF MECKLENBURG COUNTY LLC	1	1	2
MASONIC & EASTERN STAR HOME	3	3	6
NORTHERN HOSP OF SURRY CO	2		2
HOUSE OF RAEFORD FARMS INC	2	2	4
R & R POWDER COATING INC	1	1	2
DE FEET INTERNATIONAL	3	2	5
CAMBRO MANUFACTURING CO	2	2	4
AMERICAN HEBREW ACADEMY	11	7	18
NORDFAB	5	4	9
PNEUMAFIL CORPORATION	6	6	12
CONVATEC INC	2	2	4
MAY DEPT STORE	5	2	7
UNDERWRITERS LABORATORIES	1		1
SHERWIN WILLIAMS COMPANY	5	5	10
BRIDGESTONE AIRCRAFT TIRE USA INC	3	3	6
AERODYN WIND TUNNEL LLC	1	1	2

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Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
BEOCARE INC	2	3	5
LEMCO MILLS INC	2	2	4
SYNTEC SEATING SOLUTIONS LLC	1	1	2
THE CLEARING HOUSE PAYMENTS COMPANY LLC	1	1	2
O T SPORTS IND INC	1	1	2
RALEIGH RC GREEN LLC	3	3	6
TALBERT BUILDING SUPPLY INC	1	1	2
TYSON FARMS INC	21	21	42
SONOCO PRODUCTS COMPANY	2	2	4
BILLY GRAHAM EVANGELISTIC	6	5	11
CSHV SOUTHPARK, LLC	1	1	2
ADVANCE STORES CO	1	1	2
WEIL MCLAIN	2	2	4
CAROLINA STALITE CO	11	11	22
DATA CHAMBERS, LLC	1	2	3
SALEM ACADEMY & COLLEGE	14	12	26
THOMASVILLE, CITY OF	3	3	6
THE FRESH MARKET	1	1	2
NATIONAL GENERAL MANAGMENT CORP.	5	2	7
TICONA POLYMERS, INC	1	1	2
MCLEOD LEATHR & BELT	1	1	2
ALTEC INDUSTRIES INC	1	1	2
GETRAG GEARS OF NA	2	2	4
SV CENTER LLC	2	2	4
RACK ROOM SHOES	1	1	2
MOORESVILLE CITY SCHOOLS	8	7	15
WFMY TV INC	2	2	4
ARROW INTERNATIONAL INC	2	2	4
NW CHANDLER BUILDING LP	1	1	2
NW BRIXHAM GREEN ONE LP	1		1
NW WINSLOW BUILDING LP	1	1	2
NW BETSILL BUILDING LP	1		1
NW SIMMONS BUILDING LP	1	1	2
NW BOYLE BUILDINGS LP	2	2	4
NWBH 1 LP	2	2	4
NW GRAGG BUILDING LP	1	1	2
PURULATOR FACET INC	3		3
UNIQUE TEX	1		1
RH MANUFACTURING LLC	2	2	4
TS@KINGS MOUNTAIN VII LLC	1		1
MOSES CONE HEALTH SYS	16	14	30
OWASA	6	5	11
GRANGES AMERICAS INC	1	1	2
POPPELMANN PLASTICS USA LLC	1		1
VALLEY HILLS MALL	9	9	18
STARPORT I, LLC	1		1
CONTINENTAL STRUCTURAL PLASTICS	1	3	4
PIEDMONT ROW DRIVE, LLC	1		1
NW BRIXHAM GREEN TWO LP	1	1	2
NW BALLANTYNE ONE LP	1	1	2
NW HIXON BUILDING LP	1	1	2
NW BALLANTYNE TWO LP	1	1	2
NW JJH BUILDING LP	2	2	4
NW RICHARDSON BUILDING LP	1	1	2
NW WOODWARD BUILDING LP	1	1	2
NW BRIXHAM GREEN THREE LP	1	1	2
HUGH CHATHAM MEM HOSPITAL	39	39	78
J C PENNEY CO	4	4	8
FLOWERS BAKING COMPANY	2	1	3
WESTROCK COMPANY	4	3	7
FLOWERS BAKERY OF WINSTON SALEM LLC	4	3	7
SPX FLOW INC.	1	1	2
RANDY D MILLER	1	1	2
ULTIMATE TEXTILE INC	2	2	4
LIBERTY COMMONS NURSING AND REHABILITATION CENTER OF MATTHEWS	1	1	2
DEBOTECH INC	1	1	2
REEP-OF-C WATER RIDGE NC HOLDCO LLC	5	5	10
WELLSPRING RETIREMNT COMM INC	5	4	9
WELL SPRING RET	5	2	7
MINNESOTA MINING & MFG CO	2	2	4
THE POLYMERS CENTER OF EXCELLENCE	2	2	4
LIBERTY HEALTHCARE PROPERTIES OF BALLANTYNE LLC	1	1	2
ROCKWOOD LITHIUM INC	1	1	2

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Customer Bill Name	DSM YR17(1/1/17-12/31/17) RIDER OPT-OUT	EE YR17(01/01/17-12/31/17) RIDER OPT-OUT	Grand Total
HICKORY PRINTING SOLUTIONS, LLC	2	2	4
WALNUT CIRCLE PRESS	2	2	4
NC DEPT OF PUBLIC SAFETY	23	22	45
101 SOUTH TRYON LP	2	1	3
NOVOZYMES NORTH AMERICAN INC	1	1	2
NC STATE UNIVERSITY	1	1	2
MARVEL-SCHEBLER AIRCRAFT CARBORATORS	2	2	4
ALL GRANITE INC	3	3	6
FRYE REGIONAL MEDICAL CENTER	6	5	11
ALEXANDRIA REAL ESTATE EQUITIES INC	5	2	7
AERO ACCESSORIES INC	3	3	6
SOUTHERN CAST	3	3	6
KBSIII CARILLON LLC	1	1	2
DURHAM BULLS	2	2	4
PIEDMONT TOWN CENTER ONE, LLC	1		1
NW CALHOUN BUILDING LP	1	1	2
NW CULLMAN PARK LP	1	1	2
NW BRIGHAM BUILDING LP	1		1
NW EVERETT BUILDING LP	1		1
NW IRBY BUILDING LP	1	1	2
AUTOMATED SOLUTIONS LLC	2	2	4
CORNERSTONE CHARTER ACADEMY INC	2	2	4
DELTA PHOENIX, INC.	1	1	2
SCA PACKAGING NORTH AMERICA	2	2	4
ARE-NC REGION NO 11, LLC	2	2	4
NW CRAWFORD BUILDING LP	1	1	2
NR CHARLOTTE LLC	1	1	2
NW BALLANTYNE THREE LP	1	1	2
NW HAYES BUILDING LP	1	1	2
NW FRENETTE BUILDING LP	1	1	2
YMCA OF NORTHWEST NORTH CAROLINA	3	2	5
CRONLAND LUMBER CO	5	5	10
GIBSON ACCUMULATOR, LLC	3	2	5
US NATIONAL WHITEWATER CENTER, INC	13	13	26
FIBER COMPOSITES CORPORATION	2	4	6
GILBARCO INC	1	1	2
HANCOCK & MOORE, INC		7	7
ALAMANCE FOODS INC		4	4
TRUE TEXTILES, INC		1	1
MECK AREA CATH SCHLS		3	3
CASCADE DIE CASTING GRP INC		2	2
CENTRAL REGIONAL HOSPITAL		5	5
JOHN UMSTEAD HOSPITAL		4	4
MEAT AND SEAFOOD SOLUTIONS LLC		7	7
DOW CORNING CORP		11	11
TOWN OF CHAPEL HILL		2	2
RESEARCH TRIANGLE INSTITUTE		1	1
Grand Total	4,863	4,075	8,938

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Duke Energy Carolinas, LLC

List of Industrial and Commercial Customers Opted-Out Vintage 2016 and Opted-In Vintage 2017

Docket No. E-7, Sub 1164

Customer Bill Name	EE Rider	Number of Accounts
ALADDIN MANUFACTURING CORPORATION		2
BIOMERIEUX, INC		1
BURLINGTON COAT FACTORY		2
CAROLINA CONTAINER		1
CATAWBA COUNTY SCHOOLS		3
CENTURY FURNITURE, LLC		1
CLARIANT CORPORATION		1
CPCC		4
ELASTIC FABRICS OF AMERICA		1
FOOD LION		87
GENUINE PARTS COMPANY		2
GLEN RAVEN INC		1
GUILFORD COLLEGE		6
GUILFORD COUNTY SCHOOLS		2
HARRIS TEETER INC		38
HERITAGE HOME GROUP LLC		1
INDUSTRIAL WOOD PROD		2
INDUSTRIAL WOOD PRODUCTS		3
JAMES M PLEASANTS CO		1
LEXINGTON FURNITURE IND		1
LOWES FOODS		2
MCCREARY MODERN INC		2
PARKER HANNIFIN CORPORATION		1
PBM GRAPHICS INC		1
ROWAN SALISBURY SCHOOLS		1
SPENCERS INCORPORATED OF MOUNT AIRY, NC		1
TARGET STORES		17
TAYLOR KING FURNITUR		1
TE CONNECTIVITY CORPORATION		1
THE GC NET LEASE (CHARLOTTE) INVESTORS LLC		1
TOWN OF VALDESE		2
UNCC		1
W S FORSYTH COUNTY SCHOOLS		5
WAKE FOREST UNIVERSITY HEALTH SCIENCES		1
WXII TELEVISION		1
ZINK IMAGING INC		1
Total		199

Customer Bill Name	DSM Rider	Number of Accounts
CITY OF CHARLOTTE		1
IPEX USA, INC		1
TE CONNECTIVITY CORPORATION		1
Total		3

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Duke Energy Carolinas, LLC
Share Savings Incentive Calculation
Docket Number E-7, Sub 1164
Estimate January 1, 2019 - December 31, 2019

		System	
NPV of AC - Res EE ¹		\$	93,815,645
NPV of AC - Non Res EE			158,328,908
NPV of AC - DSM			102,613,710
Total NPV of Avoided Costs	A	\$	354,758,264
Program Costs - Res EE ¹		\$	48,409,981
Program Costs - Non Res EE			57,234,649
Program Costs - DSM			31,286,990
Total Program Costs	B	\$	136,931,619
Net Savings	C=A-B	\$	217,826,644
Sharing Percentage	D		11.50%
Shared Savings - Res EE		\$	5,221,651
Shared Savings - Non Res EE			11,625,840
Shared Savings - DSM			8,202,573
Total Shared Savings	E=(A-B)*D	\$	25,050,064

1) Excludes AC and Program Costs associated with Income Qualified Energy Efficiency and Weatherization Assistance, which is deemed to be cost recovery only.

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EM&V Activities

Planned Evaluation, Measurement and Verification (EM&V) Activities through the rate period (Dec. 31, 2018)

Evaluation is a term adopted by Duke Energy Carolinas (DEC), and refers generally to the systematic process of gathering information on program activities, quantifying energy and demand impacts, and reporting overall effectiveness of program efforts. Within evaluation, the activity of measurement and verification (M&V) refers to the collection and analysis of data at a participating facility/project. Together this is referred to as "EM&V."

Refer to the accompanying Evans Exhibit 12 chart for a schedule of process and impact evaluation analysis and reports that are currently scheduled.

Energy Efficiency Portfolio Evaluation

DEC has contracted with independent, third-party evaluation consultants to provide the appropriate EM&V support, including the development and implementation of an evaluation plan designed to measure the energy and demand impacts of the residential and non-residential energy efficiency programs.

Typical EM&V activities:

- Develop evaluation action plan
- Process evaluation interviews
- Collect program data
- Verify measure installation and performance through surveys and/or on-site visits
- Program database review
- Impact data analysis
- Reporting

The process evaluation provides unbiased information on past program performance, current implementation strategies and opportunities for future program improvements. Typically, the data collection for process evaluation consists of surveys with program management, implementation vendor(s), program partner(s), and participants; and, in some cases, non-participants. A statistically representative sample of participants will be selected for the analysis.

The impact evaluation provides energy and demand savings resulting from the program. Impact analysis may involve engineering analysis (formulas/algorithms), billing analysis, statistically adjusted engineering methods, and/or building simulation models, depending on the program and the nature of the impacts. Data collection may involve surveys and/or site visits. A statistically representative sample of participants is selected for the analysis. Duke Energy Carolinas intends to follow industry-accepted methodologies for all measurement and

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verification activities, consistent with International Performance Measurement Verification Protocol (IPMVP) Options A, C or D depending on the measure.

The field of evaluation is constantly learning from ongoing data collection and analysis, and best practices for evaluation, measurement and verification continually evolve. As updated best practices are identified in the industry, DEC will consider these and revise evaluation plans as appropriate to provide accurate and cost-effective evaluation.

Demand Response Program Evaluation

DEC has contracted with independent, third-party evaluation consultants to provide an independent review of the evaluation plan designed to measure the demand impacts of the residential and non-residential demand response programs and the final results of that evaluation.

Typical EM&V activities:

- Collect program data
- Process evaluation interviews
- Verify operability and performance through on-site visits
- Collect interval data
- Program database review
- Benchmarking research
- Dispatch optimization modeling
- Impact data analysis
- Reporting

The process evaluation provides unbiased information on past program performance, current implementation strategies and opportunities for future improvements. Typically, the data collection for process evaluation consists of surveys with program management, implementation vendor(s), program partner(s), and participants; and, in some cases, non-participants. A statistically representative sample of participants will be selected for the analysis.

The impact evaluation provides demand savings resulting from the program. Impact analysis for Power Manager involves a simulation model to calculate the duty cycle reduction, and then an overall load reduction. Impact analysis for PowerShare involves statistical modeling of an M&V baseline load shape for a customer, then modeling the event period baseline load shape and comparing to the actual load curve of the customer during the event period.

The field of evaluation is constantly learning from ongoing data collection and analysis, and best practices for evaluation, measurement and verification continually evolve. As updated best practices are identified in the industry, DEC will consider these and revise evaluation plans as appropriate to provide accurate and cost-effective evaluation.

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EM&V EFFECTIVE DATE TIMELINE

This chart contains the expected timeline with end of customer data sample period for impact evaluation and when the impact evaluation report is expected to be completed. Unless otherwise noted, original impact estimates are replaced with the first impact evaluation results, after which time subsequent impact evaluation results are applied prospectively.

Program	Program/Measure	2014				2015			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Appliance Recycling	Refrigerator, Freezer	1st EM&V	Report					2nd EM&V	Report
Energy Efficiency Education (K12 Curriculum)	Energy Efficiency Education (K12 Curriculum)							3rd EM&V	Report
Energy Efficient Appliance and Devices	Lighting - Smart Saver CFL							3rd EM&V	Report
	Lighting - Specialty Bulbs			1st EM&V	Report				
	SF Water EE Products							1st EM&V	Report
HVAC Energy Efficiency	HP Water Heater & Pool Pumps								
	Residential Smart Saver AC and HP			1st EM&V	Report				
Income-Qualified Energy Efficiency	Tune & Seal Measures								
	Weatherization								
Multi-Family Energy Efficiency	Refrigerator Replacement								
	Low Income Neighborhood			1st EM&V	Report			1st EM&V	Report
My Home Energy Report	MyHER	Report							
Residential Energy Assessments	Home Energy House Call								
Non-Residential Smart Saver Energy Efficiency Custom	Non-Res SmartSaver Custom Rebate								
Non-Residential Smart Saver Energy Efficiency Food Service	Non-Res Smart Saver Energy Efficiency Food Service								2nd EM&V
Non-Residential Smart Saver Energy Efficiency HVAC Products	Non-Res Smart Saver Energy Efficiency HVAC Products								2nd EM&V
Non-Residential Smart Saver Energy Efficiency Lighting	Non-Res Smart Saver Prescriptive Lighting								
Non-Residential Smart Saver Energy Efficiency Motors Pumps Drives	Non-Res Smart Saver Prescriptive Other (VFDs or other)								2nd EM&V
Non-Residential Smart Saver Energy Efficiency Process Equipment	Non-Res Smart Saver Energy Efficiency Process Equip								2nd EM&V
Small Business Energy Saver	SBES								
Smart Energy in Offices	SEIO	Report							

Key

	Original Estimate
	1st EM&V
	2nd EM&V
	3rd EM&V
	4th EM&V

Program	Program/Measure	2016				2017				2018				2019			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Appliance Recycling	Refrigerator, Freezer																
Energy Efficiency Education (K12 Curriculum)	Energy Efficiency Education (K12 Curriculum)							1st EM&V	Report			4th EM&V	Report				
Energy Efficient Appliance and Devices	Lighting - Smart Saver RLED (Free LED)							1st EM&V	Report								
	Lighting - Specialty Bulbs										2nd EM&V	Report					
	SF Water EE Products							2nd EM&V	Report					3rd EM&V	Report		
HVAC Energy Efficiency	HP Water Heater & Pool Pumps									Report							
	Referral and Non-Referral HVAC Measures								2nd EM&V	Report							
Income-Qualified Energy Efficiency	Weatherization								1st EM&V	Report							
	Refrigerator Replacement													3rd EM&V	Report		
Multi-Family Energy Efficiency	Low Income Neighborhood			2nd EM&V	Report											3rd EM&V	Report
My Home Energy Report	MyHER				3rd EM&V	Report						4th EM&V	Report				
Residential Energy Assessments	Home Energy House Call										3rd EM&V	Report		Report			4th EM&V
Business Energy Reports	BEA							1st EM&V	Report			2nd EM&V	Report				
EnergyWise Business	EnergyWise Business (EE measure)																
Non-Residential Smart Saver Energy Efficiency Custom	Custom Rebate & Custom Assessment				2nd EM&V	Report					3rd EM&V	Report					
Non-Residential Smart Saver Prescriptive	All Prescriptive Technologies	Report							3rd EM&V	Report							
Non-Residential Energy Assessment							1st EM&V	Report									
Small Business Energy Saver	SBES			1st EM&V	Report				2nd EM&V	Report							
Smart Energy in Offices	SEIO							1st EM&V	Report								

Note: Residential Smart Saver AC and HP and Non-Residential Prescriptive lighting measures have completed a additional EM&V report in the past. Future reports combine measures for the respective programs.

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2016 Evaluation Report for the Duke Energy Carolinas PowerShare® Program

Prepared for:

Duke Energy

January 27, 2017

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EXECUTIVE SUMMARY

This document presents Navigant's evaluation of the Duke Energy Carolinas (DEC) PowerShare® Program for Program Year 2016. The PowerShare Program is a demand response (DR) program offered to commercial and industrial customers that is part of the portfolio of demand side management and energy efficiency (DSM/EE) programs offered by Duke Energy. PowerShare offers participating companies and agencies a financial incentive to reduce their electricity consumption when called upon by Duke Energy.

The DEC program offers customers four options to choose between:

- **Mandatory Curtailment:** In exchange for a monthly availability payment and event performance payments, participants must reduce load during each Mandatory Curtailment Period (MCP) to a contracted firm level.
- **Voluntary Curtailment:** In exchange for an event performance payment, participants may reduce load to a pre-nominated level during Voluntary Curtailment Periods (VCPs).
- **Generator Curtailment:** In exchange for a monthly availability payment and event performance payments, participants must transfer load from a Duke Energy source to a private generation source during Generator Curtailment Periods (GCPs).
- **CallOption Curtailment:** In exchange for a monthly availability payment and event performance payments, participants must reduce load during Emergency or Economic Curtailment periods to a contracted firm level. There are currently no DEC customers enrolled in the CallOption PowerShare option and so this option is not addressed in this report.

No Voluntary curtailment events were called in the period of analysis.

Evaluation Objectives

The research objectives of this evaluation are as follows:

1. Validate Duke Energy's DR baseline approach and calculations, as well as the monthly and seasonal capability calculations.
2. Audit the hourly kW DR event load shed for participating customers by replicating the Schneider Electric Energy Profiler Online™ (EPO) methods used to calculate the energy (kWh) and demand (kW) impacts that are used to determine settlement payments.

To complete the first objective, Navigant conducted a detailed audit of the SAS code used by Duke Energy to determine participant baselines and monthly and seasonal capability. To complete the second objective, Navigant replicated the EPO energy and demand calculations used by Duke Energy to determine settlement payments.

Key Findings

This section presents Navigant's key evaluation findings for the two principal evaluation objectives:



Duke Energy Baseline SAS Code Audit

Code performing correctly. Navigant performed a detailed audit of the SAS code used by Duke Energy to calculate settlement baselines, as well as monthly and seasonal capabilities, and found that the code was performing correctly. Navigant's approach to reviewing the SAS code was to document the flow of the datasets with high-level annotations along with making notes of the datasets utilized in each SAS script. These notes provide Duke Energy with a basis for improving the flow of the code and help identify datasets that can be deleted after each step to improve data management.

Opportunities for improved functionality. Navigant identified several opportunities to improve the functionality of the SAS code along with organizational suggestions that may reduce the potential for errors. Additionally, there is unnecessary code that has been used to explore alternative baseline calculations that can be removed from the code. Navigant's detailed recommendations provide actionable revisions to the SAS code that will simplify and consolidate the analysis. Follow-up discussions with Duke Energy indicate the unnecessary code, which is represented as comments, is being reviewed and either eliminated or simplified.

Verification and Validation of Settlement Energy and Demand Calculations

Settlement calculations verified as correct. EPO is used by Duke Energy to determine the energy (kWh) and capacity (kW) values that are the basis for calculating monthly settlement amounts. Navigant replicated the calculations for all of the participants in the period from June through September of 2016. A comparison of Navigant's replicated calculations with the output of EPO revealed no deviations beyond what could be expected as a result of rounding error, meaning that Duke Energy's estimates are accurate per the settlement algorithms defined by the program literature. A summary of the validation results, by option and credit type, may be found in Table 1 below.

Table 1: Verification of EPO Calculations

Program Option	Credit Type	Customers	Unique Accounts	# of EPO Results Replicated^a	Average % Absolute Error^b
Mandatory Curtailment	Energy	93	168	663	0.00%
Mandatory Curtailment	Capacity	93	168	663	0.01%
Generator Curtailment	Energy	9	12	48	0.00%
Generator Curtailment	Capacity	9	12	48	0.01%

a. The number of calculations reproduced by Navigant for this analysis. For energy there is one credit calculated per participating account per event. For capacity there is one credit calculated per participating account per month. The period of analysis for this evaluation included four months and four curtailment events.

b. The absolute error represents the difference between Navigant's replicated settlement results and the EPO estimates used by Duke Energy. The near-zero error demonstrates that Navigant was able to replicate settlement calculations using the algorithms provided by Duke Energy.

Source: EPO Settlement Data and Navigant analysis



1. INTRODUCTION

This document presents Navigant's evaluation for the Duke Energy Carolinas (DEC) PowerShare Program for Program Year 2016. The PowerShare Program is a demand response program offered to commercial and industrial customers that is part of the portfolio of demand side management and energy efficiency (DSM/EE) programs offered by Duke Energy. PowerShare offers participating customers a financial incentive to reduce their electricity consumption when called upon by Duke Energy.

1.1 Program Overview

The customer contracts for DEC's PowerShare Program commence on the first day of the month and the initial contract term is three years. Customers can sign up for PowerShare at any time during the year if their DSM rider status is either Opted-In or Not Opted-Out (Opt-In then required to join the program). If they are Opted-Out, they must wait until one of the two Opt-In/Opt-Out election windows during the year (November-December or first week in March) is open in order to change their designation to Opt-In.

The DEC program offers customers four options to choose between: Mandatory Curtailment, Voluntary Curtailment, Generator Curtailment, and CallOption. There are currently no DEC customers enrolled in the CallOption PowerShare option; therefore, this option is not addressed in this report. No Voluntary curtailment events were called in the period of analysis. Curtailment options are defined as follows:

- **Mandatory Curtailment:** In exchange for a monthly availability payment and event performance payments, participants must reduce load during each Mandatory Curtailment Period (MCP) to a contracted firm level.
- **Voluntary Curtailment:** In exchange for an event performance payment, participants may reduce load to a pre-nominated level during Voluntary Curtailment Periods (VCPs).
- **Generator Curtailment:** In exchange for a monthly availability payment and event performance payments, participants must transfer load from a Duke Energy source to a private generation source during Generator Curtailment Periods (GCPs).

The PowerShare Program is designed to encourage the participating organizations to reduce their electricity consumption for up to 100 hours each year on system peak days. Duke Energy contracts with Schneider Electric to calculate monthly customer settlements for the PowerShare Program. Schneider Electric is a specialized firm providing services in energy management and automation. The PowerShare settlements are calculated with the use of Schneider Electric's Energy Profiler Online (EPO), a third-party hosted software application designed to assist utilities with energy data analysis. EPO uses participant interval data, Duke Energy-generated participant baselines and a set of program option-specific calculations to determine the event energy (kWh) and monthly capacity (kW) values that determine participant settlement payments.

1.2 Evaluation Objectives

The research objectives of this evaluation are:

1. Validate the detailed DR baseline approach and calculations, as well as the seasonal and monthly capability calculations performed by Duke Energy.



2. Audit the hourly kW DR event load shed for participating customers by replicating the Schneider Electric Energy Profiler Online™ (EPO) methods used to calculate the energy (kWh) and demand (kW) impacts that are used to determine settlement payments.

1.2.1 Validate Detailed DR Baseline Approach and Capability Calculations

To complete the first objective, Navigant conducted a detailed audit of the SAS code used by Duke Energy to determine participant baselines, monthly, and seasonal capabilities.

As established in a series of conversations with Duke Energy in August of 2016, Navigant was tasked with conducting a detailed review of the SAS code used by Duke Energy to determine participant baselines (sometimes referred to as "pro forma") and the manner in which these were used to determine monthly capability.

As specified by Duke Energy, this review focused on two key issues:

- a. Identifying technical flaws in the code (e.g., code that fails to do what the author intends it to do, or else does more than it is intended to do).
- b. Ensuring that the in-line commenting is sufficiently clear and complete that the code is useable by a competent SAS programmer with experience and understanding of demand response programs.

Navigant did not execute the code, however the Navigant analyst performed a detailed assessment of output extracts from each section of the code, and coordinated closely with the Duke Energy SAS code author throughout the review process.

1.2.2 Verify Energy and Demand Calculations Used for Settlement

To complete the second objective, Navigant replicated the energy and demand calculations used by Duke Energy to determine settlement payments and compared these with the energy and demand values reported in the program's operational tracking database for the calculation of settlement payments.

The energy and demand calculations used by Duke Energy to determine settlement payments are generated by the Energy Profiler Online (EPO) tool, a Schneider Electric software product. Schneider Electric's EPO outputs a settlement report for each participant settlement (monthly capacity and event energy settlements). Each report contains the data (including the Duke Energy baseline and the participant actuals) used and the arithmetic applied to calculate the settlement payment.

To fulfill this task, Duke Energy directed Navigant to replicate the settlement arithmetic for the population of Schneider Electric reports for all PowerShare participants from June through September of 2016. The purpose of this replication was effectively to audit the process and ensure that all algorithms were applied as specified in the program literature.

1.3 Program Rules

This sub-section provides some additional detail regarding the program rules, specifically, those rules that define how much DR participants are required to provide, and a summary of the participant credits.



This information is a summary of the DEC PowerShare Program brochure to which interested readers should refer for additional detail.¹ This section does not address the CallOption PowerShare option because, although it is available to DEC customers, there are currently no DEC customers enrolled in that option.

As noted above, there are four PowerShare program options in DEC territory, but one (CallOption) has no participants enrolled, and another (Voluntary) had no events during the summer of 2016. Each of these options is associated with one of two compliance plans:

- Fixed. A "Fixed" compliance plan is a "down by" requirement (i.e., when called participants must reduce demand by X kW).
- Firm. A "Firm" compliance plan is a "down to" requirement (i.e., when called participants must reduce demand to X kW).

The Mandatory, Voluntary and CallOption options operate under the "Firm" compliance plan, whereas the Generator option operates under the "Fixed" compliance plan.

All options require participants to commit to curtailing a minimum of 100kW per event.

Table 2, below, presents some additional detail regarding the program rules for the three PowerShare options in DEC territory with enrolled participants. Note that participants enrolled in the Mandatory option may also enroll for the Voluntary option.

¹ Duke Energy Carolinas, *PowerShare Carolinas* (Program Brochure), Accessed November 2016
<https://www.duke-energy.com/business/products/powershare>



Table 2: Detailed PowerShare Option Rules

	Mandatory	Voluntary	Generator
Eligibility	Available to customers served on rate schedules LGS, I, OPT, MP, and HP.	Available to customers served on rate schedules LGS, I, OPT, and MP.	Available to customers served on rate schedules LGS, I, OPT, and MP.
Notice	30 Minutes	Day ahead	15 Minutes
Curtailment Frequency and Timing	Curtailment may occur at any time, but may last no more than 10 hours per event. A maximum of 100 hours of curtailment may be called per year.	Curtailment may occur at any time, length of curtailment periods and number of curtailment periods are at Duke Energy's discretion, but event-by-event participation is entirely voluntary.	Curtailment may occur at any time, but may last no more than 10 hours per event. A maximum of 100 hours of curtailment may be called per year.
Energy Payment	Event Energy Credits. Energy eligible for credit is calculated as the difference between Forecasted Demand and Firm Demand during the curtailment period times. Participants earn \$0.1 of credit per kWh curtailed.	Event Energy Credits. Energy eligible for credit is calculated as the difference between Forecasted Demand and Firm Demand during the curtailment period times. Energy Credit payments for energy curtailed are market-based. Participants are eligible for payment only when 50% or more of their day-ahead nominated energy is curtailed during a Curtailment Period.	Event Energy Credits. Energy eligible for credit is the amount of energy transferred to the generator during Curtailment Period times and monthly tests. Participants earn \$0.1 of credit per kWh curtailed.
Capacity Payment	Capacity Credits. Capacity eligible for credit (i.e., "Effective Curtailable Demand") is calculated by averaging the actual hourly load less the Firm Demand (the amount participant must curtail to) over the Exposure Period (hours of overall peak demand during which curtailment is most likely). Customer credits are \$3.5/kW of Effective Curtailable Demand per month.	None	Capacity Credits. The capacity eligible for credit is determined based on the average capacity generated during all Curtailment Periods and monthly tests, and is capped at participant Maximum Curtailable Demand. Eligible capacity is calculated monthly, and participants are paid \$3.5/kW.
Penalty	Failure to reduce to Firm Demand levels incurs a penalty of \$2/kWh for every kWh consumed above the Firm Demand level.	None	Failure to reduce by more than 50% of Maximum Curtailable Demand results in an energy charge of \$2/kWh for energy shortfall below 50% of Maximum Curtailable Demand.

Source: Duke Energy

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2. EVALUATION METHODS

This section of the PowerShare evaluation outlines the methods employed by the evaluation team to complete the evaluation.

This section is divided into two sub-sections:

- **Duke Energy Baseline SAS Code Audit.** This sub-section describes Navigant's approach to auditing the SAS code developed by Duke Energy to estimate participant baselines and calculate capabilities.
- **Replication of EPO Calculations.** This sub-section describes the approach and data used to replicate the EPO calculations that deliver the energy and demand used by Duke Energy to determine settlement payments.

2.1 Duke Energy Baseline SAS Code Audit

Navigant's approach to reviewing the SAS code was to document the flow of the datasets with high-level annotations along with making notes of the datasets utilized in each SAS script. The notes taken on the datasets utilized in each script were provided to Duke Energy in an Excel workbook. These technical notes are intended to provide Duke Energy with a basis for improving the flow of the code and to help identify datasets that can be deleted after each step to improve data management. The high-level annotations are included in Navigant's documentation of the SAS code process flow, which may be found in Appendix A of this report.

2.2 Replication of EPO Calculations

This sub-section describes the approach and data used by Navigant to replicate the EPO calculations for energy and demand used by Duke Energy to determine settlement payments.

It is divided in two parts:

- **Input Data.** This part lists the key data and documents used as inputs for this analysis.
- **Description of EPO Calculations.** This part provides the algebraic descriptions of the calculations replicated by Navigant.

2.2.1 Input Data

Navigant used the following key input data and documents to replicate the EPO settlement calculations:

1. EPO settlement results data
2. DEC PowerShare participants' interval consumption data
3. DEC PowerShare Program brochure²

² The DEC PowerShare Program brochure can be found at <https://www.duke-energy.com/business/products/powershare>



4. The Schneider Electric summary of data required to complete settlement algorithms, provided to Navigant by Duke Energy.
5. PowerShare program guidelines, provided to Navigant by Duke Energy.

2.2.2 Description of EPO Calculations

This section summarizes Navigant's replication of the EPO calculations that estimate the energy and demand values used by Duke Energy to determine settlement. There are several key terms that are worth formally defining in order to clarify their use in equations that follow. These terms are:

- **Exposure Period:** Hours of overall peak demand which curtailment is most likely. Actual curtailment events can occur outside of seasonal exposure period.
- **Forecasted Demand:** Estimated hourly demand a customer would normally exhibit in absence of curtailment.
- **Firm Demand:** Portion of demand not subject to interruption (curtailment).
- **Maximum Curtailable Demand:** Maximum amount of load transferred from the utility source to the generator during Curtailment Periods and monthly tests that is eligible for incentives.

Navigant applied the equations in this section to the interval consumption data resulting in the relevant energy or capacity credits. Navigant then compared the calculated credits to the EPO settlement data and verified that the results were essentially identical for each calculation.³

Event Energy Credits (Applies to Mandatory and Voluntary Participants)

$$CE = \sum_h [MAX(F_h - M) - MAX(0, A_h - M)]$$

Where:

- | | | |
|----------------|---|---|
| CE | = | Curtailed energy, |
| F _h | = | Forecasted demand in half-hour h within the curtailment period, |
| M | = | Firm demand, |
| A | = | Actual demand in half-hour h |

And where F_h > A_h, and zero otherwise.⁴

Monthly Capacity Credits (Apply Only to Mandatory Participants)

$$ECD = A_i - M$$

Where:

- | | | |
|----------------|---|--|
| A _i | = | Average demand for month i during the exposure period, |
| M | = | Firm demand, |
| ECD | = | Effective Curtailment Demand |

³ Some small insignificant differences in individual calculations were found due to rounding effects.

⁴ NB Navigant verified only the energy curtailed amounts that contributed to participant energy credit calculation. Verification of energy use during the curtailment period that was subject to penalty payments was not verified.

**Event Energy Credits (Applies Only to Generator Participants)**

$$GE = \sum_h (G_h)$$

Where:

- GE = Generated energy eligible for credit,
 G_h = Energy generated in half hour h

Generated energy above the maximum curtailable demand for any half hour is not eligible.

Monthly Capacity Credits (Applies Only to Generator Participants)

$$AMGC = \sum_{e \in m} (GE_e) / \sum_{e \in m} (H_e)$$

Where:

- AMGC = Average monthly generated capacity,
 Ge_e = Generated energy eligible for credit in event e,
 H_e = Number of half-hour intervals in event e
 $e \in m$ = Events occurring during month m

Events are defined as all generator curtailment events and tests in a given month



3. EVALUATION FINDINGS AND RESULTS

This section describes the findings and results of Navigant's evaluation. It is divided into two sections:

- **Duke Energy Baseline SAS Code Audit.** This section describes Navigant's findings and recommendations based on our audit of the Duke Energy SAS code.
- **PowerShare Impacts and Findings from Navigant's Replication of EPO Calculations.** This section describes Navigant's findings based on our analysis of the program tracking database⁵ and the replication of the EPO calculations that deliver the energy and demand impacts used by Duke Energy to determine settlement payments.

3.1 Duke Energy Baseline SAS Code Audit

Navigant has identified several opportunities to improve the functionality of the SAS code along with making the code more readable for other support staff. The following list of findings and suggestions are intended to improve functionality and consistency:

Methodology and Baseline Calculations

- Navigant has found that Duke Energy is correctly conducting settlement baseline calculations in the daily baseline calculation code in accordance with the intended approach.
- During the review of calculations for seasonal capabilities (separate from daily baseline calculations), Navigant found that the forecast includes the holidays of July 4th and Labor Day, and that those holidays are treated as regular weekdays.⁶ Although the impact of treating two holidays as weekdays rather than weekends would be very minimal, Navigant suggests that Duke Energy consider treating those holidays as weekends in the code.
- Weekday and weekend datasets for calculating DR capabilities are created using the "today()" function. This would cause an error in weekend calculations if the code is run on a weekend since there is a dependency of "today" being a weekday. Navigant understands that Duke Energy calculates the weekend capabilities on Fridays so there are likely no errors, however we recommend that Duke Energy consider updating the capability codes to account for day type in case the estimates are ever calculated on a weekend.

SAS Code Functionality

- The 'main' SAS script for each jurisdiction should be simplified to improve readability and consistency.
 - Recommendation: Move all analysis into sub-routines and update the 'main' scripts to only do the following:
 - Define global macro variables
 - Import external data
 - Call sub-routine SAS scripts

⁵ The "program tracking database" refers to the documentation provided by Duke Energy outlining the reported capacity and energy values used by Duke for settlement payment.

⁶ The seasonal capabilities are estimated for summer (June-September) and winter (January and February).

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- Comments and descriptions should be added to the beginning of each file and section of code to provide simplified documentation of what the code accomplishes.
 - Recommendation: Add at least a one-sentence description at the beginning of each SAS script file and at the beginning of each section of code.
- After each SAS script is run, temporary datasets and macro variables that are not used in subsequent scripts should be deleted to avoid any misuse of data from preceding analysis.
 - Recommendation: Include the "PROC DATASETS" procedure at the end of each script to delete datasets and macro variables that are no longer needed.
- Delete any code that is not being used in the analysis to improve readability and prevent errors.
 - Recommendation: Delete all unnecessary code that has been commented out of each script.

3.2 PowerShare Impacts and Findings from Navigant's Replication of EPO Calculations

This section describes Navigant's findings based on our analysis of the program tracking database and the replication of the EPO calculations that deliver the energy and demand impacts used by Duke Energy to determine settlement payments.

Navigant replicated the EPO calculations for all of the participants in the period from June through September of 2016. A comparison of Navigant's replicated calculations with the output of the EPO revealed no deviations beyond what could be expected as a result of rounding error, meaning that Duke Energy's estimates are accurate. A summary of the validation results, by option and credit type may be found in Table 3, below.

Table 3: Verification of EPO Calculations

Program Option	Credit Type	Customers	Unique Accounts	# of EPO Results Replicated ^a	Average % Absolute Error ^b
Mandatory Curtailment	Energy	93	168	663	0.00%
Mandatory Curtailment	Capacity	93	168	663	0.01%
Generator Curtailment	Energy	9	12	48	0.00%
Generator Curtailment	Capacity	9	12	48	0.01%

- a. The number of calculations reproduced by Navigant for this analysis. For energy there is one credit calculated per participating account per event. For capacity there is one credit calculated per participating account per month. The period of analysis for this evaluation included four months and four curtailment events.
- b. The absolute error represents the difference between Navigant's replicated settlement results and the EPO estimates used by Duke Energy. The near-zero error demonstrates that Navigant was able to replicate settlement calculations using the algorithms provided by Duke Energy.

Source: EPO Settlement Data and Navigant analysis

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This value is calculated according the EPO algorithms described above using Duke Energy's participant baselines and participant interval data. The vast majority of this was delivered by customers enrolled in the Mandatory Curtailment option. The energy reduction achieved for the July 13th event is smaller than the other events because the July 13th event lasted 2.5 hours, while the July 14th event lasted five hours and the events on July 25th and 26th each lasted six hours. The total energy impacts per event for the summer of 2016 by PowerShare option are summarized in Table 4, below.

Table 4: Summary of 2016 Event Impacts (Total Program MWh per Event)

Program Name	July 13 th	July 14 th	July 25 th	July 26 th	Total
Mandatory Curtailment	673	1,405	1,729	1,736	5,543
Generator Curtailment	18	37	44	45	144

Source: EPO Settlement Data and Navigant analysis

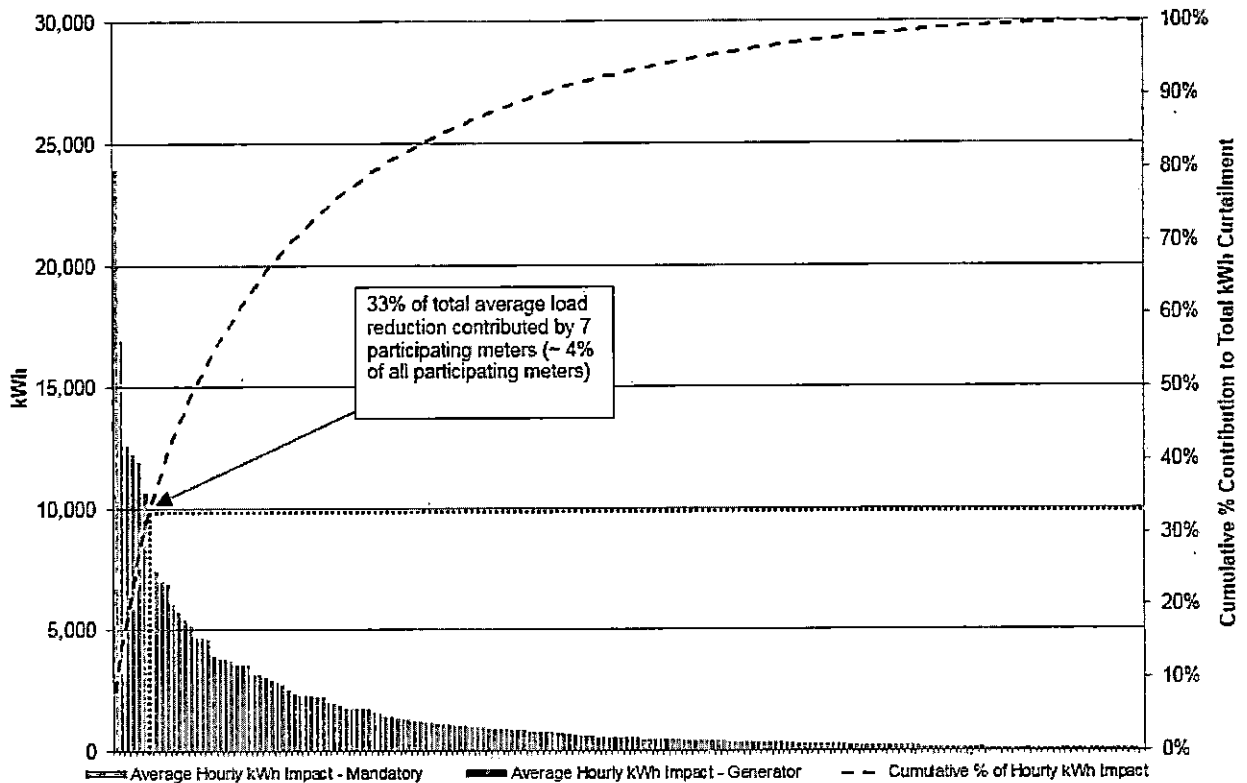
Total program impacts are driven by curtailment for individual meters, with a relatively small percentage having significant impacts. Seven of the 180 meters participating in 2016 accounted for approximately one third of total curtailment. Figure 1 shows each meter's average hourly event energy reduction across the summer. These are sorted in descending order, to highlight the contrast between the largest and smallest contributors in the program.

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Figure 1: Average Event Curtailment by Participant



Source: EPO Settlement Data and Navigant analysis

The PowerShare Program paid out capacity credits to participants for an average monthly capacity of nearly 328 MW during the summer of 2016. This value is calculated according to the EPO algorithms described above using Duke Energy's participant baselines and participant interval data. As is the case for delivered energy, the vast majority of this was delivered by customers enrolled in the Mandatory Curtailment option. The total DR capacity per month for the summer of 2016 by PowerShare option is summarized in Table 5, below.

Table 5: Total Monthly Capacity for 2016 (MW)

Program Name	June	July	August	September	Average
Mandatory Curtailment	329	302	337	312	320
Generator Curtailment	8	7	9	9	8

Source: EPO Settlement Data and Navigant analysis

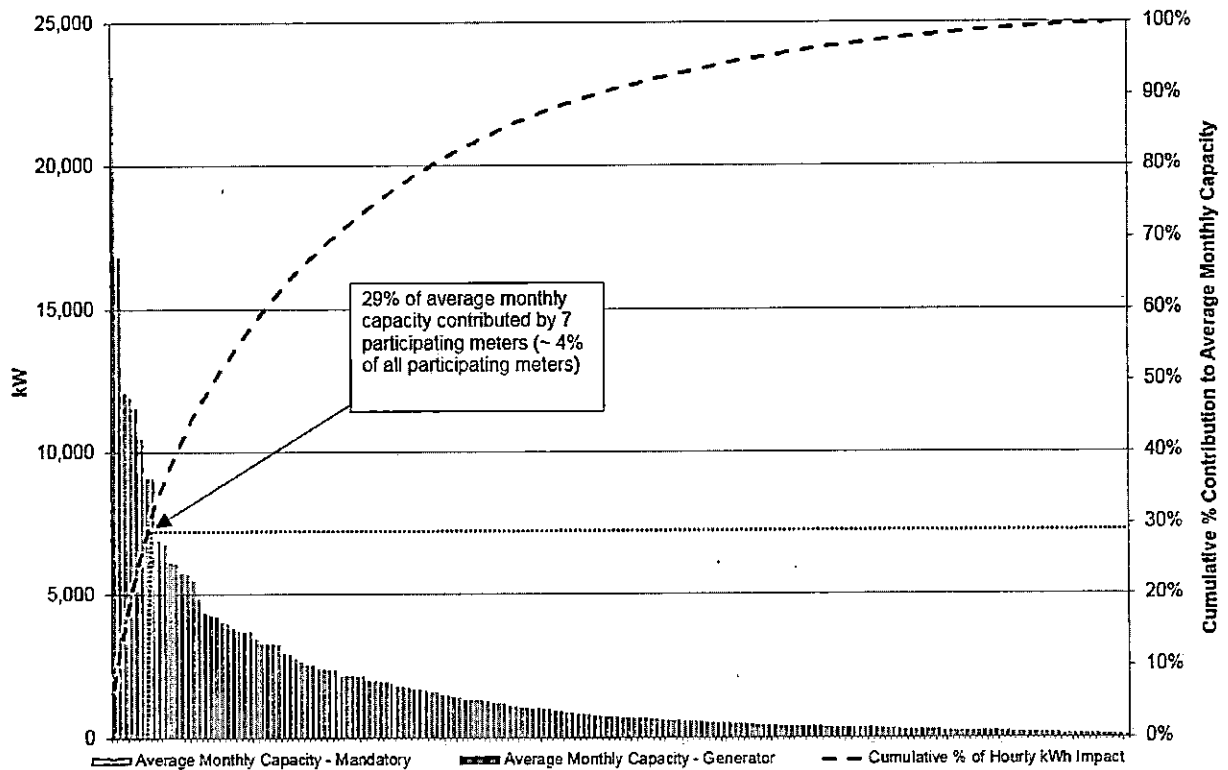
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Similar to average event curtailment, average monthly capacity is driven by a small percentage of meters. The ranking of participants by their average monthly capacity is nearly identical to that of their average event reduction. Figure 2 shows that the top seven meters in terms of average monthly capacity account for 29% of total average monthly capacity. Six of the top seven meters in average monthly capacity are the same as the top seven meters in average event curtailment.

Figure 2: Average Monthly Capacity by Participant

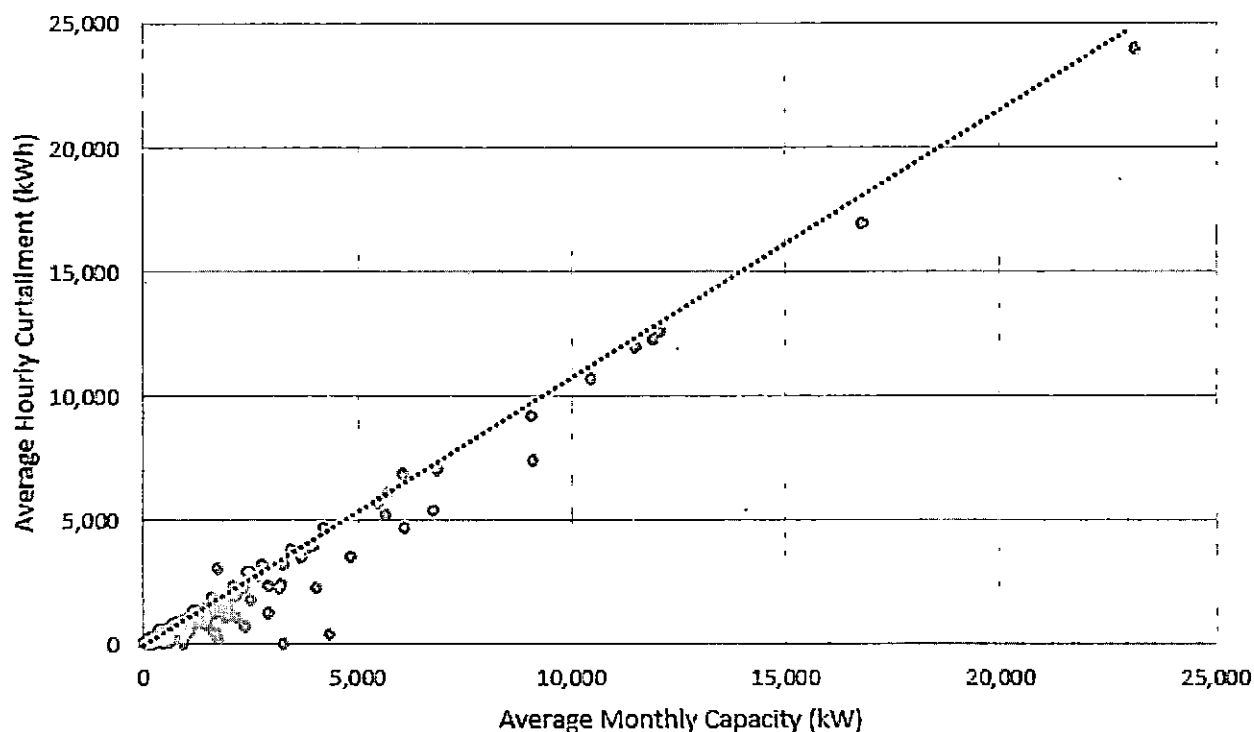


Source: EPO Settlement Data and Navigant analysis

As suggested by the similarity of Figure 1 and Figure 2, most participants' average monthly capacity is nearly equal to their average hourly event curtailment. Figure 3 plots each participant's average monthly capacity compared to average hourly curtailment. The dotted line shows a 1:1 proportion of capacity to curtailment, and illustrates that most participants fall close to this proportion.



Figure 3: Capacity vs. Curtailment by Participant



Source: EPO Settlement Data and Navigant analysis

Program participation⁷ was consistent throughout the summer with an average of approximately 160 customers participating in the Mandatory Curtailment option and 12 customers participating in the Generator Curtailment option. Table 6, below, provides a summary of the number of customers, by option, that participated in each event.

Table 6: Summary of Participation by Event for 2016 (Number of Participants)

Program Name	July 13 th	July 14 th	July 25 th	July 26 th	Average
Mandatory Curtailment	156	161	157	155	157
Generator Curtailment	12	12	12	12	12

Source: EPO Settlement Data and Navigant analysis

⁷ For the purposes of this evaluation report, a meter is defined as having "participated" in an event when only when it delivers some energy reduction during the curtailment period.



4. CONCLUSIONS AND RECOMMENDATIONS

This section presents Navigant's key evaluation findings for the two principal evaluation objectives:

- **Duke Energy Baseline SAS Code Audit.** This sub-section presents the key findings of Navigant's audit of the Duke Energy SAS code used to estimate baseline and capability calculations.
- **Verification and Validation of Settlement Energy and Demand Calculations.** This sub-section presents the key findings of Navigant's efforts to replicate the calculation of the participant-level kWh and kW impacts used to determine settlement payments.

4.1 Duke Energy SAS Code Audit

Navigant's detailed review of Duke Energy's SAS code determined that the settlement baseline and monthly and seasonal capabilities are being calculated correctly per Duke Energy's definitions. Navigant provided a series of recommendations to Duke Energy that are meant to enhance the functionality of the code, and reduce potential for errors. Navigant recommends the following:

Methodology and Baseline Calculation Recommendations

- Update the DR capability code to take into account the day type for each day in the capability period.

SAS Code Functional Recommendations

- Move all analysis into sub-routines and update the 'main' scripts to simplify the flow of analysis
- Add at least a one sentence description at the beginning of each SAS script file and at the beginning of each section of code.
- Include the "PROC DATASETS" procedure at the end of each script to delete datasets and macro variables that are no longer needed.
- Delete all unnecessary code that has been commented out of each script.

4.2 Verification and Validation of Settlement Energy and Demand Calculations

Navigant found no major discrepancies when replicating Duke Energy's settlement calculations per the algorithms defined in Section 2.2. This finding confirms that Duke Energy's procedure for calculating impacts is functioning in accordance with the program definitions.

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APPENDIX A: DUKE BASELINE SAS PROCESS FLOW

The following outline provides a functional description of what the SAS code is doing in the Duke Energy Carolinas region. These notes are intended as documentation that can be referenced without a deep understanding of the nuances of SAS code.

Duke Energy Carolinas Code:

- Set date ranges for analysis
- Import line losses
- Import load data
- Import participation data
- Consolidate IS and PS datasets
- Flag weekend days and holidays in load data
- Flag event days in load data
- Data quality checks
 - Remove non-participants from data
 - Assess missing data by account
 - Identify accounts with insufficient data for forecast
 - Analyze accounts with some missing data (partial days missing vs. whole days)
 - Identify intervals with 0 load
 - Generate PDF report of data quality metrics
- Forecast capability
 - Weekday forecast
 - Select data for pro forma forecast (excludes weekends, event days, and holidays)
 - Prior 480 intervals (10 days) in Southeast (30-minute intervals)
 - Calculate average load by hour and account
 - Generate a list of the next 35 days from today's date for forecast dates
 - Merge KW values with the forecast date list
 - Weekend forecast
 - Select weekend days for forecast
 - Prior 192 intervals (4 days) in Southeast (30-minute intervals)
 - Calculate the average KW by hour and account
 - Generate a list of the next 35 days from today's date for forecast dates
 - Join average KW values to forecast dates when the day is Saturday or Sunday
 - Select the weekdays from the weekday forecast series and join to the weekend forecast
 - Produce 'slinger' (*.LSE) file using the forecast
 - Create hourly forecast dataset to estimate and report capability
 - Join account IDs to hourly forecast data for weekdays
 - Calculate capability based on compliance plan
 - Remove accounts with insufficient data
 - Output summarized capability for parent accounts
 - Summarize capability by program, state, and hour
 - Adjust capability for line losses
 - Count the number of participants by program and state
 - Repeat preceding steps, but using weekend forecast
 - Calculate generator capability with line loss adjustments to the Firm Fixed KW value
 - Summarize generators by state with participant counts and KW
 - Generate PDF reports with participant counts, KW capability, and data deficiency summaries for weekdays and weekends

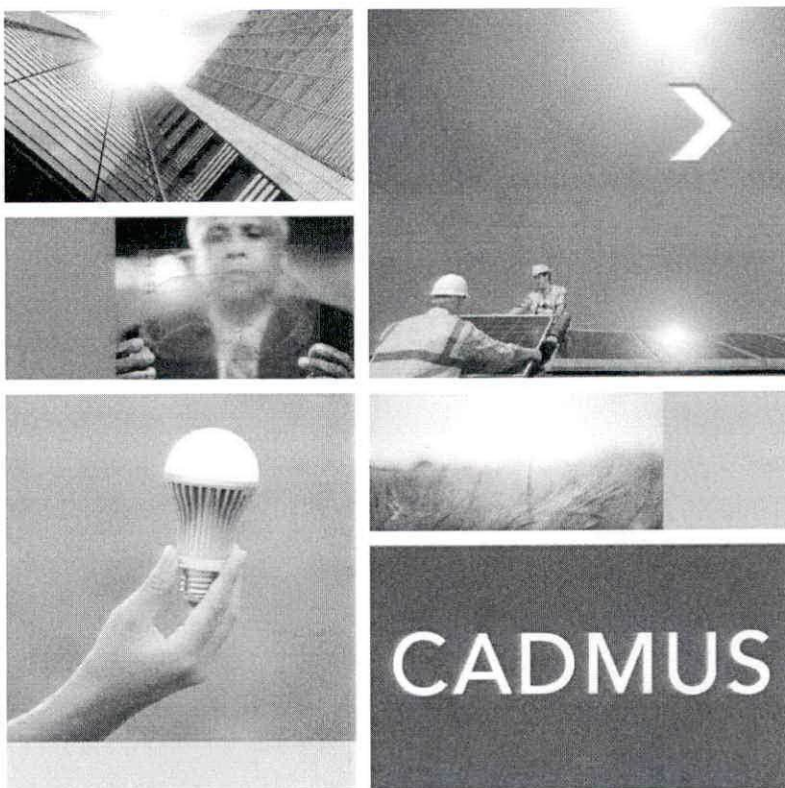
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February 13, 2017

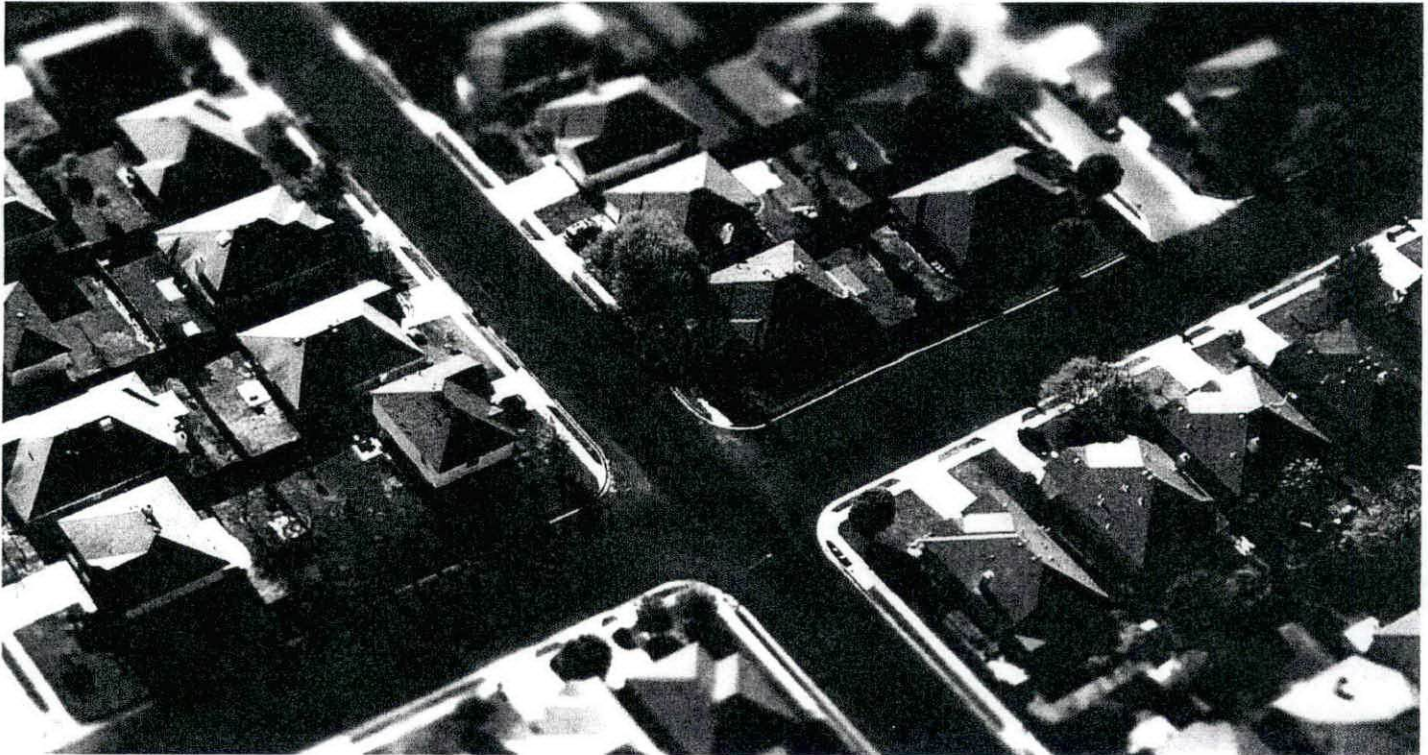
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Reimagine tomorrow.



My Home Energy Report Program Evaluation

Submitted to Duke Energy Carolinas
February 16, 2017

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Duke Carolinas 2016 Power Manager Evaluation

April 13, 2017

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EM&V Report for the Small Business Energy Saver Program

Duke Energy Progress and Duke Energy Carolinas

Prepared for:

Duke Energy



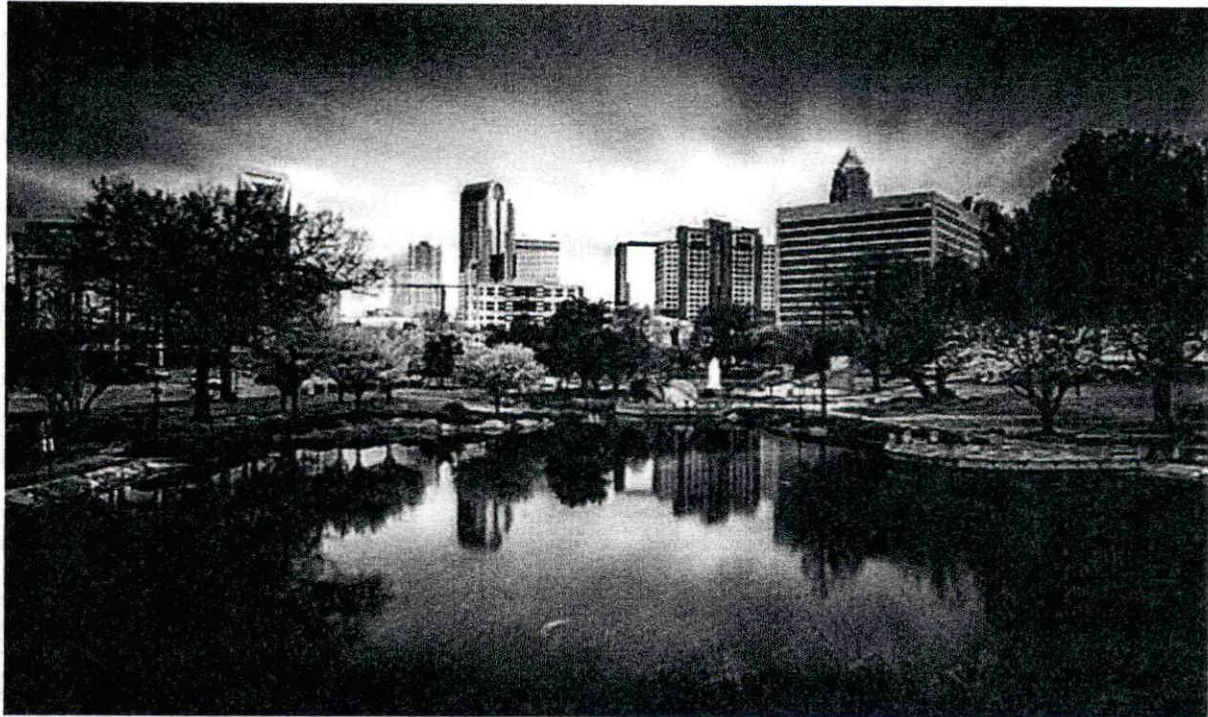
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September 27, 2016
Revised June 6, 2017



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Non-Residential Assessments Program Year 2014-2016 Evaluation Report

Submitted to Duke Energy Carolinas
in partnership with Tetra Tech

June 8, 2017

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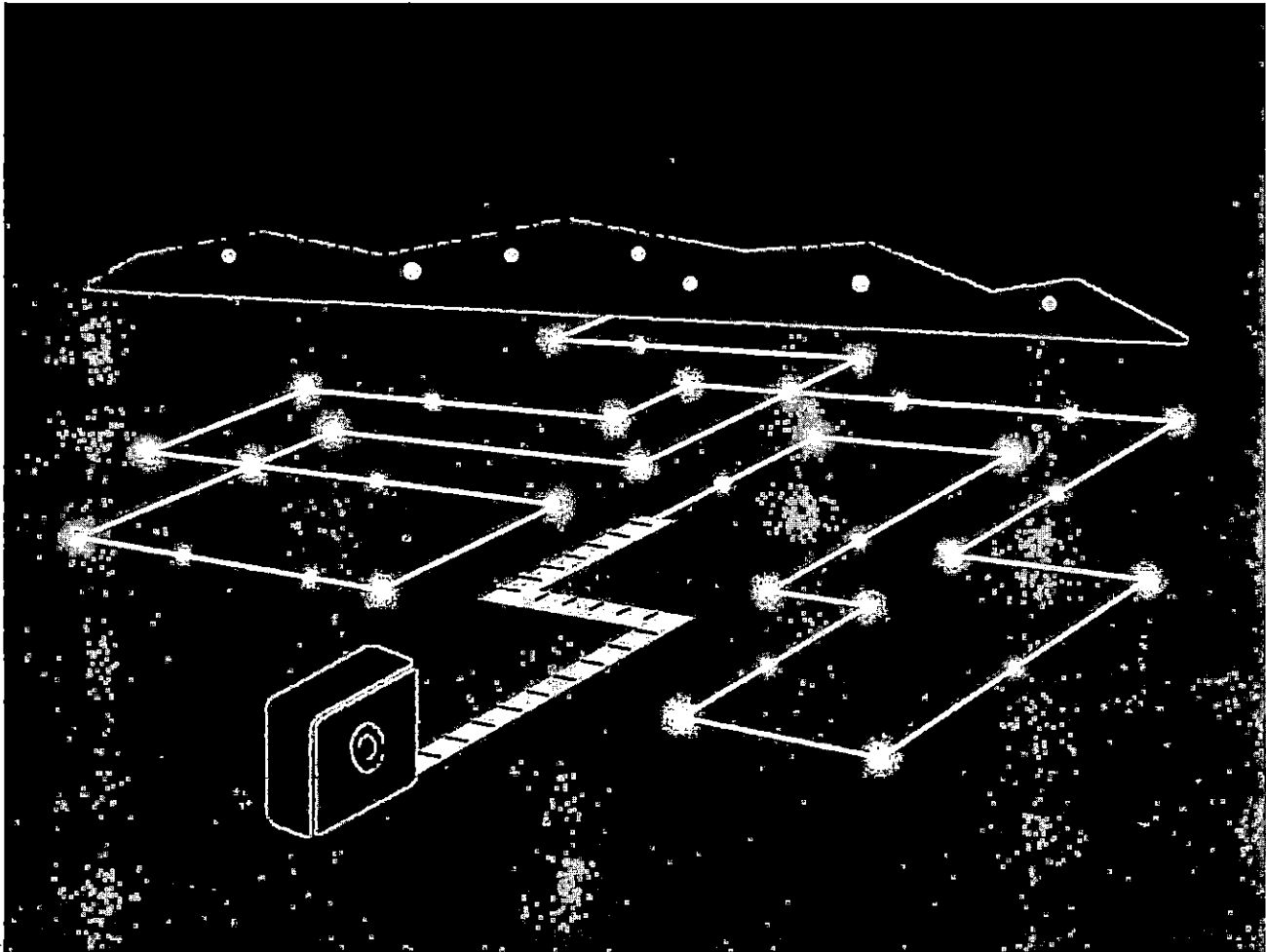


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Duke Energy Carolinas and Progress

EnergyWise for Business Programs
Evaluation Report – Final

June 12, 2017



Opinion Dynamics

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Evaluation Summary

1. Evaluation Summary

1.1 Program Summary

The Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) EnergyWise for Business Program is a demand response (DR) and energy efficiency (EE) program that provides small businesses with the opportunity to participate in DR events, earn incentives, and realize additional energy efficiency (EE) benefits. The program was introduced in 2016 and offers participants either a programmable, two-way WiFi Smart Thermostat or a Load Control Switch. Participants can select one of three levels of DR participation—30% cycling, 50% cycling, and 75% cycling—with varying levels of earned incentives based on the selected cycling strategy. Smart thermostat participants who have a heat pump with electric resistance heat strips are also offered the option of participating in winter DR events and can earn additional incentives per season. Customers who opt for the smart thermostat have the ability to manage their thermostat remotely with presets that help them potentially realize energy savings. Duke Energy contracted with Comverge to implement this program.

The program targets small businesses with a qualifying central air conditioning system and a minimum usage of 1,000 kWh per month during the billing months of May through September. By the end of 2016, the program had enrolled a total of 606 customers and 1,202 devices. The program called three summer but no winter DR events in 2016.

1.2 Evaluation Objectives

The 2016 evaluation included a deemed savings review and an engineering-based gross impact analysis to answer the following key research questions:

1. What were the estimated gross demand response impacts from the program in 2016?
2. What were the estimated gross energy efficiency impacts from the program in 2016?

It should be noted that this evaluation did not include a regression-based modeling approach, which is the industry-standard approach to estimating impacts from DR events. As such, the results of this evaluation should be interpreted as directional. The upcoming evaluation of the 2017 EnergyWise for Business Program will include a regression-based model approach to estimating both DR and EE impacts.

1.3 High-Level Findings

Based on our engineering-based impact analysis, the EnergyWise for Business Program fell short of planned savings in 2016, realizing between one-quarter (DEP) and one-third (DEC) of planned DR savings and just above 40% of planned EE savings.

Table 1-1 presents the results of our DR and EE analyses, including ex ante and ex post values for the number of devices, per device savings, and overall impacts, by jurisdiction. The table also presents the resulting realization rates.

Evaluation Summary

Table 1-1. Summary of Gross Impact Analysis

Estimate	DEC			DEP		
	Ex Ante	Ex Post	Realization Rate	Ex Ante	Ex Post	Realization Rate
Demand Response Impacts						
Average # of Participating Devices ^A	625	442	71%	355	262	74%
Average Per Device kW Savings	3.59	1.54	43%	3.59	1.25	35%
Total Demand Response Savings	2,244	682	30%	1,274	329	26%
Energy Efficiency Impacts						
Number of Enrolled Thermostats ^B	750	692	92%	426	447	105%
Average Per Thermostat kWh Savings	1,450	641	44%	1,450	562	39%
Total Energy Efficiency Savings	1,087,500	443,344	41%	617,700	251,433	41%

^A Ex post values represent the average number of devices (across the three 2016 DR events) that were enrolled during the event and did not opt out. These are the devices that achieved demand reductions during the 2016 events.

^B Ex ante and ex post values represent thermostats enrolled at the end of 2016.

Two factors contributed to the shortfall in savings:

1. **Per-unit savings assumptions:** Our deemed savings review found that ex ante per-unit savings were too high, mostly due to an overestimate of the size (tonnage) of the controlled air conditioning units. Since equipment size is directly correlated with savings, the smaller than expected controlled units significantly affected realized EE and DR savings. On the DR side, other contributors to lower than expected per unit savings were a higher than planned adoption of thermostats (which in 2016 were estimated to achieve lower DR savings than switches) and a slight under-enrollment in the more aggressive cycling strategies for DEP.
2. **Enrollment:** By the end of 2016, the program had almost met its planned number of enrolled devices: Enrollment for DEC was 92% of projections while enrollment for DEP exceeded projections (105%). As a result, enrollment assumptions did not significantly contribute to the shortfall in EE savings. Device enrollment did affect DR impacts, however, as some of the devices were not installed until after the summer DR events. As a result, participation levels in the DR events were just short of three-quarters of planned participation.

1.4 Evaluation Recommendations

Because this evaluation was limited to an engineering-based analysis, there is uncertainty about the program impacts achieved in 2016. However, based on our comparison of planning and verified assumptions, we provide the following recommendations for future program planning.

Adopt More Conservative HVAC Average Tonnage Values

The tonnage values tracked in the program participation database suggest that Duke Energy's current planning values are too high. Pending results from the 2017 evaluation, the program may wish to lower its planning values as smaller units, everything else being equal, will achieve lower savings compared to larger units. As a result, an erroneous tonnage assumption might result in the program not achieving its savings goals.

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Evaluation Summary

Increase Promotion of Higher Cycling Strategies among Program Enrollees

Participants in DEP seemed to shy away from enrolling in the 75% cycling strategy and opted for strategies that result in lower savings. As such, we encourage Duke Energy to put additional emphasis on 75% cycling when recruiting participants, as it will lead to greater savings. Another alternative would be for Duke Energy to adjust its ex ante assumptions regarding cycling strategies. While this would not increase savings, it would provide more realistic planning assumptions and improve realization rates.

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Program Description

2. Program Description

2.1 Program Design

The Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) EnergyWise for Business program is a demand response (DR) and energy efficiency (EE) program that provides small businesses with the opportunity to participate in DR events, earn incentives, and realize additional EE benefits. The program was introduced in 2016 and offers participants either a programmable, two-way WiFi Smart Thermostat or a Load Control Switch. Participants can select one of three levels of DR participation—30% cycling, 50% cycling, and 75% cycling—with varying levels of earned incentives based on the selected cycling strategy. Smart Thermostat participants who have a heat pump with electric resistance heat strips are also offered the option of participating in winter DR events and can earn additional incentives per season. Customers who opt for the smart thermostat have the ability to manage their thermostat remotely with presets that help them potentially realize energy savings. Duke Energy contracted with Comverge to implement this program.

The program targets small businesses with a qualifying central air conditioning system and a minimum usage of 1,000 kWh per month during the billing months of May through September.

The program was first implemented by Comverge in the DEC and DEP territories in 2016. The evaluation period considered in this report is January 1, 2016 to December 31, 2016.

2.2 Program Implementation

Duke Energy contracted with Comverge in 2016 to implement the EnergyWise for Business program. Once a customer enrolls in the program, a representative visits the site to install the devices and to show participants how to program their devices and access the web portal. Events are called on weekdays when average temperature criteria are met and a high system peak is projected. Each time an event is scheduled, participants are notified via email and through the web portal. During the event, the devices display a message that an event is in progress. Participants are able to opt out of events at any time before or during the event.

2.3 Program Participation

Based on the program-tracking database, the program distributed 1,202 devices in 2016, associated with 606 unique customer accounts. Customers overwhelmingly opted for Smart Thermostats (95%) over Load Control Switches (5%). The 30% cycling strategy was the most popular among customers, with 63% of devices enrolled into that cycling level. Only 23% of devices were enrolled in the 50% cycling strategy and 14% in the 75% cycling strategy. Table 2-1 provides the distribution of device types and cycling strategies.

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Program Description

Table 2-1. Counts of Enrolled Devices, Device Jurisdiction, Type, and Cycling Strategy

Jurisdiction and Cycling Strategy	Number of Devices			Percentage of Total Devices in Jurisdiction		
	Thermostat	Switch	Total	Thermostat	Switch	Total
DEC						
30%	393	12	405	54%	2%	56%
50%	169	16	185	23%	2%	25%
75%	130	9	139	18%	1%	19%
Jurisdiction Total	692	37	729	95%	5%	100%
DEP						
30%	289	19	308	61%	4%	65%
50%	113	5	118	24%	1%	25%
75%	45	2	47	10%	<1%	10%
Jurisdiction Total	447	26	473	95%	5%	100%
Overall Total	1,139	63	1,202	95%	5%	100%

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3. Overview of Evaluation Activities

To address the research objectives for this evaluation, Opinion Dynamics performed a range of data collection and analytic activities. These activities are summarized in this section.

3.1 Program Staff Interviews

We conducted an in-depth interview with the Duke Energy EnergyWise for Business program manager. This interview took place in January 2016. The purpose of this interview was to understand the program's current design and implementation, and to determine the priorities for the impact evaluation.

3.2 Program Materials Review

To inform the subsequent analyses, Opinion Dynamics reviewed program materials, including program design and implementation materials, relevant research reports, and most notably the program-tracking database.

3.3 Engineering-Based Impact Analysis to Determine Ex-Post Savings and Realization Rate

To determine program impacts, the evaluation team used a three-step process: (1) we conducted a deemed savings review; (2) we performed an analysis of the program participation database; and (3) we estimated ex post savings and calculated realization rates.

Step 1: Deemed Savings Review. Opinion Dynamics reviewed inputs and algorithms provided by Duke Energy to document existing (ex ante) assumptions and claimed EE and DR savings. We then performed an engineering analysis using various Technical Reference Manuals (TRMs) and secondary sources to develop verified (ex post) per-unit savings estimates for Smart Thermostats and Load Control Switches. As part of this analysis, we looked up cooling equipment characteristics, based on model numbers, for a sample of 54 participants to update program assumptions about equipment efficiency. We then updated the ex ante savings values based on our engineering analysis and the customer data we received. The deemed savings review, including references to all sources used, is presented in Appendix A.

Step 2: Participation Analysis. The evaluation team reviewed program-tracking data to assess program participation during the evaluation period. This effort included:

- A review of the program participation database to determine the total number of devices and participants, the type of devices installed, and the cycling strategies employed, as well as device installation dates.
- A review of thermostat and switch reports to identify opt-outs.

Step 3: Estimation of Ex Post Savings and Realization Rates. To estimate ex post savings, we applied the ex post per-unit savings values from the deemed savings review (Step 1) with participation counts from the participation analysis (Step 2). We then calculated realization rates for both energy and demand impacts by dividing ex post (evaluated) savings by ex ante (claimed) savings.

4. Gross Impact Evaluation

Our gross impact evaluation included three main analytic steps: (1) a deemed savings review, (2) a participation analysis, and (3) estimation of ex post savings analysis and realization rates for the demand response and energy efficiency components of the program. Figure 4-1 depicts this process.

Figure 4-1. Gross Impact Evaluation Approach



The following subsections describe our approach and the results for each of the three steps.

4.1 Deemed Savings Review

The goal of the deemed savings review was to examine existing program savings values and assumptions and to develop new estimates that the program can use going forward. Our review consisted of several activities:

- We reviewed inputs and algorithms provided by Duke Energy. We also reviewed source documents and program filings to determine existing assumptions about per-device DR and EE savings.
- We reviewed the TRMs for Arkansas, Illinois, Indiana, and the Mid-Atlantic, as well as secondary sources to establish an algorithm for EE savings and to inform assumptions for new per-unit savings estimates for Smart Thermostats and Load Control Switches.
- We used tonnage information from the program-tracking database to update default program assumptions.
- We conducted a look-up of 54 equipment model numbers to develop an estimate of the average efficiency (expressed as the Seasonal Energy Efficiency Ratio [SEER]) of participants' cooling equipment.

Based on the results of these activities, we developed new per-device savings values.

Below, we summarize the inputs for estimating both DR and EE impacts and present the results of the analysis. The full deemed savings review is included in Appendix A.

4.1.1 Demand Response Load Impacts

Our evaluation of the 2016 EnergyWise for Business Program did not include a model-based analysis of DR events.¹ However, one of the key determinants of summer DR event savings is the size (tonnage) of the

¹ Note that a full, model-based DR impact analysis will be performed as part of our 2017 program evaluation.

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controlled cooling equipment. Our comparison of program tonnage assumptions with actual tonnage information in the program-tracking database found that the size of participants' cooling equipment is substantially smaller than the program assumption. Everything else being equal, smaller equipment size would lead to smaller per-device DR event savings. To provide updated per device-DR savings, we therefore developed a ratio of actual to assumed equipment size (i.e., average ex post tonnage/average ex ante tonnage). We applied this ratio to the program's ex ante per-device savings assumptions (by device type and cycling strategy), using the following formula:

$$\text{Per-Device kW Event Savings} = \text{Ex Ante kW} * \text{Ex Post Tons/Ex Ante Tons}$$

Table 4-1 provides the ex ante and ex post tonnage assumptions, by device type and jurisdiction, and the resulting tonnage ratios. Tonnage ratios range from 0.36 for equipment controlled by DEP load control switches to 0.46 for equipment controlled by DEC smart thermostats.

Table 4-1. Tonnage Assumptions for Estimating DR Event Impacts

Parameter	Smart Thermostat			Load Control Switch		
	Ex Ante	Ex Post		Ex Ante	Ex Post	
		DEC	DEP		DEC	DEP
Tonnage	9.62	4.41	4.08	9.62	4.02	3.48
Tonnage Ratio		0.46	0.42		0.42	0.36

^AIn instances where tonnage values were missing from the program participation database (n = 65 devices), the average tonnage for that device and jurisdiction value was imputed.

Table 4-2 shows the program's ex ante per-device savings assumptions for thermostats and switches, by cycling strategy, and the ex post values that result from applying the tonnage ratios to the ex ante values. Given the relatively low tonnage ratios, estimated ex post kW savings are less than half of ex ante savings, across both jurisdictions and device types.

Table 4-2. Assumptions for Estimating Per Device DR Event Savings (kW)

Cycling Strategy	Smart Thermostat			Load Control Switch		
	Ex Ante kW	Ex Post kW		Ex Ante	Ex Post kW	
		DEC	DEP		DEC	DEP
30% Cycling	2.02	0.93	0.86	2.50	1.04	0.90
50% Cycling	3.77	1.73	1.60	4.25	1.78	1.54
75% Cycling	6.27	2.88	2.66	6.75	2.82	2.44

4.1.2 Energy Efficiency Impacts

The program's energy efficiency impacts are associated with smart thermostats only. Duke Energy provided tonnage assumptions as well as per device ex ante savings, but did not provide the algorithm used to develop these savings. We compared the ex ante tonnage assumption with actual tonnages from the program tracking databases and calculated per thermostat ex post savings using the following equation, which is common to most TRMs for thermostat measures:

$$\text{kWh savings per thermostat} = \text{Tonnage} * 12/\text{SEER} * \text{EFLHcool} * \text{ESF}$$

Table 4-3 summarizes the ex ante tonnage and per device savings assumptions (provided by Duke Energy) and provides the ex post inputs into the EE savings formula. These inputs include the average equipment

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tonnage, the average equipment efficiency (SEER), Equivalent Full Load Cooling Hours (EFLHcool), and the Energy Savings Factor (ESF). The deemed savings review memo (Appendix A) provides more detail about these inputs, including the sources of information.

Table 4-3. Assumptions for Estimating EE kWh Impacts

Parameter	Ex Ante Value		Ex Post Value	
	DEC	DEP	DEC	DEP
Tonnage	9.62	9.62	4.41	4.08
SEER	Unknown		11.2	11.8
EFLHcool	Unknown		1,355	1,355
ESF	Unknown		10%	10%
Savings per Thermostat (kWh)	1,450	1,450	641	563

Similar to the per device DR impacts, the greater ex ante tonnage assumption was largely responsible for the difference between ex ante and ex post per-thermostat EE savings. While we do not have ex ante values for SEER, EFLHcool, and ESF, nor the algorithm used, we calculate per-thermostat EE savings of 1,397 kWh (DEC) and 1,326 kWh (DEP) when using the ex post energy savings equation and assumptions but substituting in the ex ante tonnage assumptions. These values are very close to the ex ante EE savings value of 1,450 kWh, so differences in assumptions other than tonnage would be minor.

4.2 Participation Analysis

The second step in the gross impact analysis consisted of an analysis of program enrollment and event participation, based on program tracking data and customer opt out reports. Both are described in this section.

4.2.1 Program Enrollment

According to information provided by Duke Energy, anticipated participation in the program was 1,250 devices for DEC and 710 devices for DEP. The program further assumed that 60% of devices would be thermostats and 40% would be load control switches.

Review of the program tracking data showed a total 2016 enrollment of 729 thermostats and switches in the DEC service territory and 473 thermostats and switches in the DEP service territory, just over half of what was anticipated in the program filings. It should be noted that approximately 34% of these devices were installed after the 2016 summer event season, and therefore were not able to participate in these events. The tracking data also showed a different mix of thermostats and switches from what was anticipated, with fewer customers choosing to install switches than projected.

Table 4-4 provides ex ante and ex post enrollment numbers, by device type and jurisdiction Table 4-4. Projected and Actual Program Enrollment.

Table 4-4. Projected and Actual Program Enrollment (Number of Devices)

Jurisdiction	Device Type	Demand Response			Energy Efficiency		
		# Projected	# Achieved	% Achieved	# Projected	# Achieved	% Achieved
DEC	Thermostat	750	692	92%	750	692	92%
	Switch	500	37	7%	0	0	n/a
	Overall	1,250	729	58%	750	692	92%
DEP	Thermostat	426	447	105%	426	447	105%
	Switch	284	26	9%	0	0	n/a
	Overall	710	473	67%	426	447	105%

To develop expected savings from DR events, the program also projected the share of customers that would select the different cycling strategies. The program projected 50% of enrollment in the 30% cycling strategy, 30% of enrollment in the 50% cycling strategy, and 20% of enrollment in the 75% cycling strategy. These projections were fairly accurate for DEC customers, but DEP customers showed a stronger preference for the 30% cycling strategy at the expense of the 75% cycling strategy. Everything else being equal, a lower cycling percentage will generate lower DR savings. To realize expected savings, the program may therefore need to more strongly promote the higher cycling strategies, particularly among DEP customers.

Table 4-5 provides the projected and actual distributions of enrollment in the three cycling strategies.

Table 4-5. Ex Ante and Ex Post Distribution of Cycling Strategies by Jurisdiction

Jurisdiction	Projected ^A	Actual
30% Cycling Strategy		
DEC	50%	55.6%
DEP		65.1%
50% Cycling Strategy		
DEC	30%	25.4%
DEP		24.9%
75% Cycling Strategy		
DEC	20%	19.1%
DEP		9.9%

^ABased on 9/19/2014 PowerPoint presentation, entitled "Small Business Demand Response - Evaluation Gate Presentation"

4.2.2 Participation in Demand Response Events

In 2016, the program called three summer DR events, on July 8th, July 14th, and July 27th. The average peak temperature on these three event days was 96 °F.² There were no winter events called in 2016.

To assess participation in the three summer DR events, Opinion Dynamics reviewed override reports to assess the number of event opt-outs. These data were then merged with the program tracking data to determine opt-out rates by jurisdiction. As shown in Table 4-6, opt-out rates for events were low, and review of the data does not suggest that opt-outs vary as a function of cycling strategy. It is worth noting that as of the third event on July 28th, only 797 devices had been installed (66% of the total enrolled devices in 2016).

² Average peak temperature is based on weather information for Charlotte and Raleigh, NC.

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Thus, about a third of 2016 participants were not able to participate in any of the 2016 DR events as they had not yet had their devices installed.

Table 4-6. Device Participation by Event and Jurisdiction

Event Date & Jurisdiction	Enrolled Devices	Device Opt-Outs	Part. Devices	Device.Part. Rate
7/8/2016				
DEC	424	1	423	99.8%
DEP	235	1	234	99.6%
Total	659	2	657	99.7%
7/14/2016				
DEC	443	16	427	96.4%
DEP	258	8	250	96.9%
Total	701	24	677	96.6%
7/27/2016				
DEC	495	20	475	96.0%
DEP	302	1	301	99.7%
Total	797	21	776	97.4%

4.3 Estimation of Ex Post Savings

The third step in our gross impact evaluation was to estimate program DR and EE savings using the ex post deemed savings values and information from the program participation database developed in the previous steps. Below, we describe the inputs and algorithms used for the DR and EE ex post savings analyses and present the results.

4.3.1 Demand Response Impacts

For each summer DR event, we estimated kW impacts by multiplying the per-device ex post savings (shown in Table 4-2) by the number of participating devices. Since per unit ex post savings estimates vary by jurisdiction, device type, and cycling strategy, we developed 6 different ex post savings values for each jurisdiction and each event (2 device types x 3 cycling strategies). We then summed over these values to estimate the total event savings by jurisdiction.

Table 4-7 provides the number of participating devices per event, average per device savings (i.e., the weighted average across the three cycling strategies), and overall kW savings. Across both DEC and DEP, both participating devices and savings increased with each event, as a result of the program enrolling new customers as the event season progressed. On average, in DEC savings were 682 kW per event and in DEP savings were 329 kW per event, including savings from both thermostats and switches.

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Table 4-7. DR kW Savings by Event

Event Date	DEC		DEP	
	Therm.	Switch	Therm.	Switch
7/8/2016				
Number of Participating Devices	401	22	226	8
Average Per-Device kW Savings	1.52	1.86	1.28	1.18
Total Event kW Savings	609	41	288	9
7/14/2016				
Number of Participating Devices	403	24	242	8
Average Per-Device kW Savings	1.54	1.79	1.29	1.18
Total Event kW Savings	619	43	312	9
7/27/2016				
Number of Participating Devices	450	25	288	13
Average Per-Device kW Savings	1.53	1.83	1.22	1.07
Total Event kW Savings	687	46	352	14
Overall Average				
Number of Participating Devices	418	24	252	10
Weighted Average Per-Device kW Savings	1.53	1.83	1.26	1.13
Total Event kW Savings	638	44	317	11

Error! Reference source not found. shows the average ex post summer DR event impacts, by jurisdiction, relative to the ex ante values taken from program filings. Overall, the program achieved just under one-quarter of its anticipated DR savings. This shortfall is driven by two key factors: (1) the lower than projected size of participating air conditioning units and (2) the lower than expected enrollment at the time of the 2016 summer events.

The lower per-unit savings realization rate for DEP, compared to DEC, results from the relative under-enrollment in the 75% cycling strategy in that jurisdiction as well as a slightly greater tonnage adjustment compared to DEC.

Table 4-8. Program DR Impacts

Estimate	DEC			DEP		
	Ex Ante	Ex Post	Realization Rate	Ex Ante	Ex Post	Realization Rate
Average # of Participating Devices	625	442	71%	355	262	74%
Average Per Device kW Savings ^A	3.59	1.54	43%	3.59	1.25	35%
Total Program Savings	2,244	682	30%	1,274	329	26%

^AEx post kW values represent the weighted average of thermostats and switches.

4.3.2 Energy Efficiency Impacts

To estimate EE savings, we multiplied the per thermostat savings (shown in Table 4-3. Assumptions for Estimating EE kWh Impacts Table 4-3), by the number of enrolled thermostats (shown in Table 2-1). Table 4-9

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summarizes ex ante and ex post thermostat counts and per unit savings values and shows the resulting realization rates.

Table 4-9. Program Energy Efficiency Impacts

Estimate	DEC			DEP		
	Ex Ante	Ex Post	Realization Rate	Ex Ante	Ex Post	Realization Rate
Number of Enrolled Thermostats ^A	750	692	92%	426	447	105%
Average Per Thermostat kWh Savings	1,450	641	44%	1,450	562	39%
Total Energy Efficiency Savings	1,087,500	443,344	41%	617,700	251,433	41%

^A Ex ante and ex post values represent thermostats enrolled at the end of 2016.

Duke Energy achieved just over 40% of its anticipated EE kWh savings. The discrepancy between the ex ante and ex post savings is mainly due to the shortfall in per thermostat savings resulting from the lower than expected size (tonnage) of the controlled air conditioning units.

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5. Conclusions and Recommendations

5.1 Conclusions

Based on our engineering-based impact analysis, the EnergyWise for Business Program fell short of planned savings in 2016, realizing between one-quarter (DEP) and one-third (DEC) of planned DR savings and just above 40% of planned EE savings.

Table 5-1 presents the results of our DR and EE analyses, including ex ante and ex post values for the number of devices, per device savings, and overall impacts, by jurisdiction. The table also presents the resulting realization rates.

Table 5-1. Summary of Gross Impact Analysis

Estimate	DEC			DEP		
	Ex Ante	Ex Post	Realization Rate	Ex Ante	Ex Post	Realization Rate
Demand Response Impacts						
Average # of Participating Devices ^A	625	442	71%	355	262	74%
Average Per Device kW Savings	3.59	1.54	43%	3.59	1.25	35%
Total Demand Response Savings	2,244	682	30%	1,274	329	26%
Energy Efficiency Impacts						
Number of Enrolled Thermostats ^B	750	692	92%	426	447	105%
Average Per Thermostat kWh Savings	1,450	641	44%	1,450	562	39%
Total Energy Efficiency Savings	1,087,500	443,344	41%	617,700	251,433	41%

^A Ex post values represent the average number of devices (across the three 2016 DR events) that were enrolled during the event and did not opt out. These are the devices that achieved demand reductions during the 2016 events.

^B Ex ante and ex post values represent thermostats enrolled at the end of 2016.

Two factors contributed to the shortfall in savings:

1. **Per-unit savings assumptions:** Our deemed savings review found that ex ante per-unit savings were too high, mostly due to an overestimate of the size (tonnage) of the controlled air conditioning units. Since equipment size is directly correlated with savings, the smaller than expected controlled units significantly affected realized EE and DR savings. On the DR side, other contributors to lower than expected per unit savings were a higher than planned adoption of thermostats (which in 2016 were estimated to achieve lower DR savings than switches) and a slight under-enrollment in the more aggressive cycling strategies for DEP.
2. **Enrollment:** By the end of 2016, the program had almost met its planned number of enrolled devices: Enrollment for DEC was 92% of projections while enrollment for DEP exceeded projections (105%). As a result, enrollment assumptions did not significantly contribute to the shortfall in EE savings. Device enrollment did affect DR impacts, however, as some of the devices were not installed until after the summer DR events. As a result, participation levels in the DR events were just short of three-quarters of planned participation.

5.2 Recommendations

Because this evaluation was limited to an engineering-based analysis, there is uncertainty about the program impacts achieved in 2016. However, based on our comparison of planning and verified assumptions, we provide the following recommendations for future program planning.

Adopt More Conservative HVAC Average Tonnage Values

The tonnage values tracked in the program participation database suggest that Duke Energy's current planning values are too high. Pending results from the 2017 evaluation, the program may wish to lower its planning values as smaller units, everything else being equal, will achieve lower savings compared to larger units. As a result, an erroneous tonnage assumption might result in the program not achieving its savings goals.

Increase Promotion of Higher Cycling Strategies among Program Enrollees

Participants in DEP seemed to shy away from enrolling in the 75% cycling strategy and opted for strategies that result in lower savings. As such, we encourage Duke Energy to put additional emphasis on 75% cycling when recruiting participants, as it will lead to greater savings. Another alternative would be for Duke Energy to adjust its ex ante assumptions regarding cycling strategies. While this would not increase savings, it would provide more realistic planning assumptions and improve realization rates.

Summary Form

6. Summary Form

**Duke Energy Carolinas
and Progress EnergyWise
for Business Program**
Completed EMV Fact Sheet

Duke Energy Progress' and Carolinas' EnergyWise for Business Program is a demand response program that provides small businesses with the opportunity to participate in DR events, earn incentives, and realize additional EE benefits. The program offers either a programmable, two-way WiFi Smart Thermostat or a Load Control Switch to customers. Customers can select one of three levels of DR participation: 30% cycling, 50% cycling, and 75% cycling with varying levels of earned incentives based upon the selected cycling strategy. Thermostat participants having a heat pump with electric resistance heat strips are also offered the option of participating in winter DR, and can earn additional incentives per season.

Date	June 12, 2017
Region(s)	Duke Energy Carolinas & Progress
Evaluation Period	1/1/16 through 12/31/16
Total kWh Savings	DEC: 641 kWh DEP: 563 kWh
Coincident kW Impact	DEC: 681 kW DEP: 328 kW
Measure Life	Not evaluated
Net-to-Gross Ratio	Not evaluated
Process Evaluation	No
Previous Evaluation(s)	None

To determine program impacts, the evaluation team used a three-step process: (1) we conducted a deemed savings review; (2) we performed an analysis of the program participation database; and (3) we estimated ex post savings and calculated realization rates.

Step 1: Deemed Savings Review. The evaluation team reviewed the inputs and algorithms used by Duke Energy to estimate ex ante savings. The team adjusted these values based on information from program-tracking data and secondary sources. The full deemed savings review is provided in Appendix A.

Step 2: Participation Analysis. The evaluation team reviewed program-tracking data to assess program participation during the evaluation period. This effort included:

- A review of the program participation database to determine the total number of devices and participants, the type of devices installed, and the cycling strategies employed, as well as device installation dates.
- A review of thermostat and switch log data to determine device operability rates and to identify opt-outs.

Step 3: Estimation of Ex Post Savings and Realization Rates. To estimate ex post savings, we applied the ex post per-unit savings values from the deemed savings review (Step 1) with participation counts from the participation analysis (Step 2). We then calculated realization rates for both energy and demand impacts by dividing ex post (evaluated) savings by ex ante (claimed) savings.

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DSMore Table

7. DSMore Table

The embedded Excel spreadsheets below contains measure-level inputs for Duke Energy Analytics. Per-measure savings values in the spreadsheet are based on the gross and net impact analysis reported above. Measure life estimates have not been updated as part of this evaluation since it was not part of the evaluation scope.

[DSMore Tables provided in separate files]

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Appendix A. Deemed Savings Review

[Deemed Savings Review provided in a separate file]

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*All pages are filed
in the docket
system

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Mar 07 2018

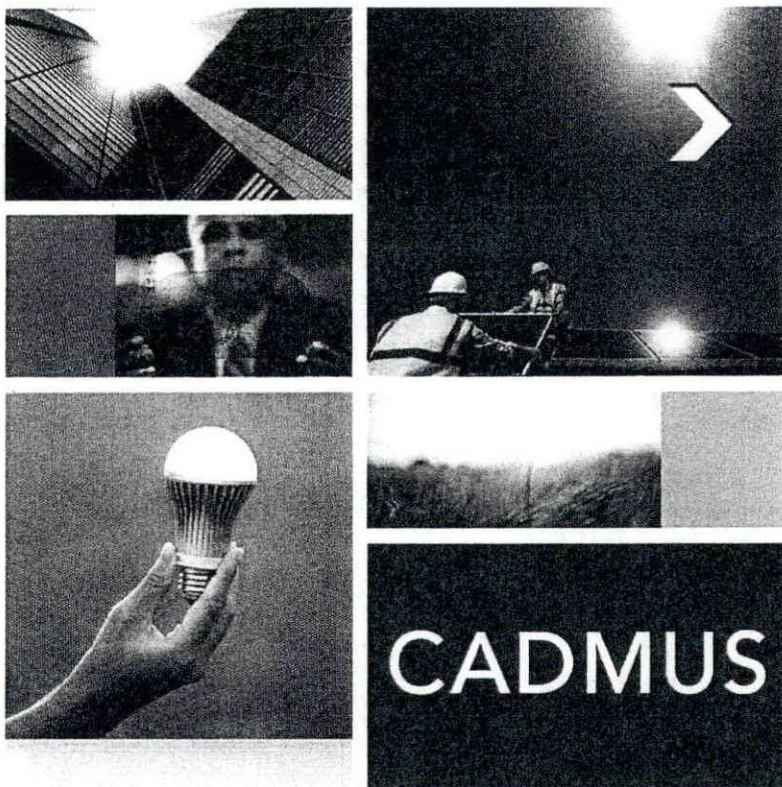
EM&V Report for the Duke Energy Multifamily Energy Efficiency Program

Prepared for:

Duke Energy Progress, Duke Energy Carolinas



October 4, 2016
Revised June 27, 2017



Duke Energy Carolinas Smart \$aver[®] Prescriptive Incentive Program

July 17, 2016

Revised August 4, 2017

Evaluation, Measurement, & Verification Report

The Cadmus Group, Inc.

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research > into > action[®]



Reimagine tomorrow.



Save Energy and Water Kits 2016 Program Year Evaluation Report

Submitted to Duke Energy
in partnership with Research into Action

November 29th, 2017

Principal authors:

Wyley Hodgson, Vikram Sridhar, Patrick Burns, Nexant

Ryan Bliss, Jordan Folks, Anne Weaver, Research into Action

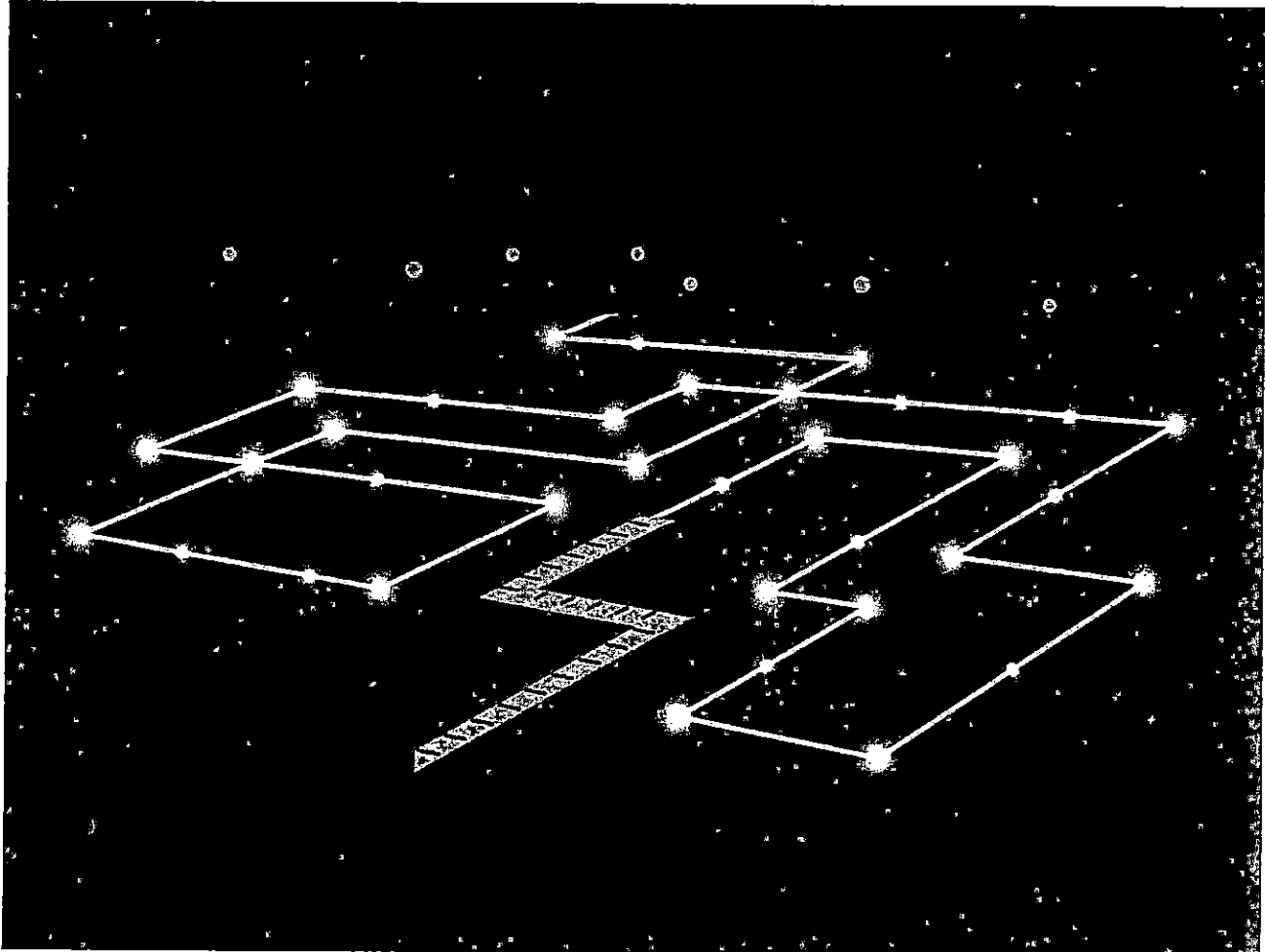


Opinion **Dynamics**

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Duke Energy Carolinas

Energy Efficient Appliances and Devices Program Final Evaluation Report

December 8, 2017

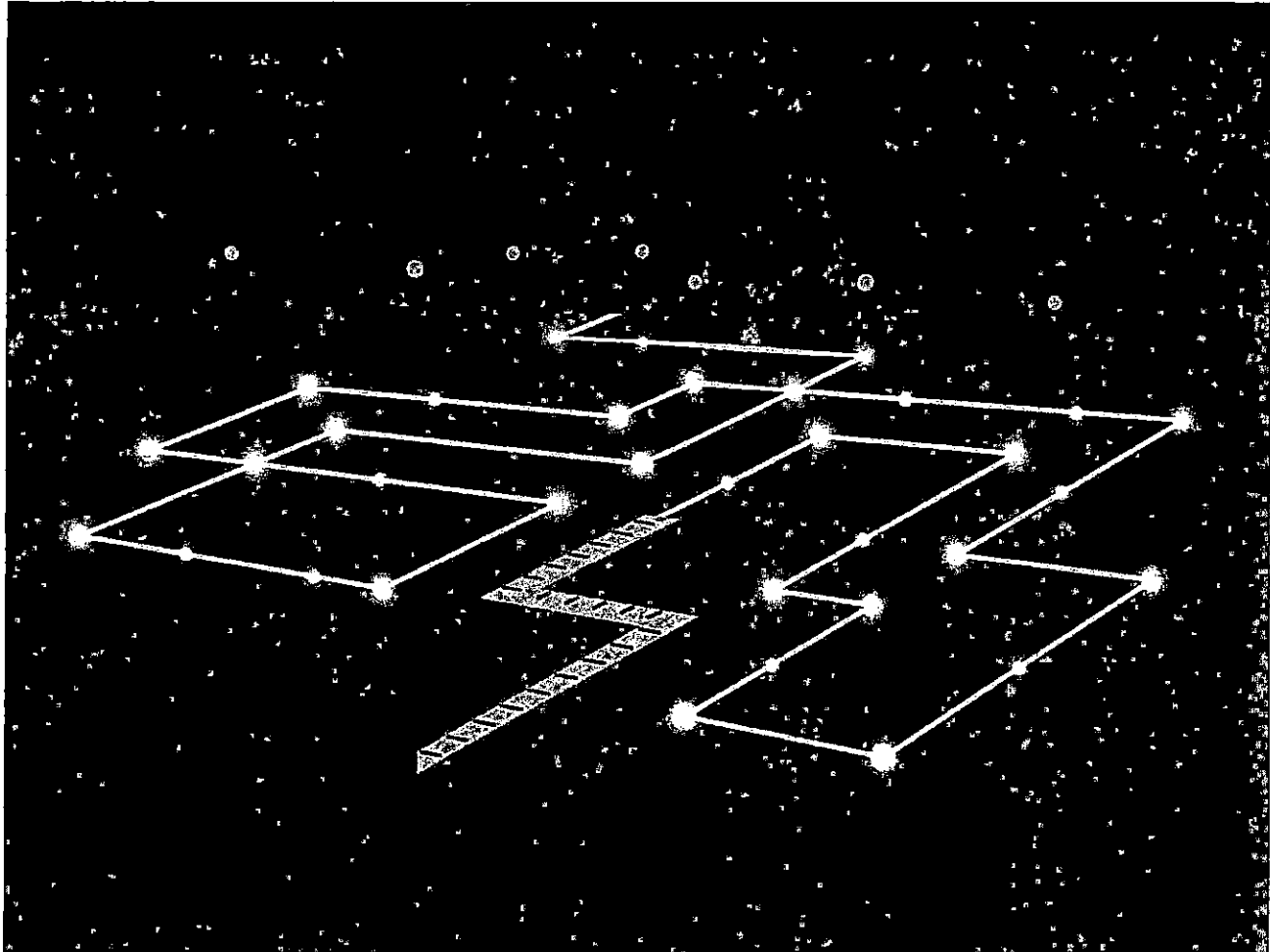


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Duke Energy Carolinas

Smart Energy in Offices Evaluation Report

December 15, 2017



S.C. Coastal Conservation League and Southern Alliance for Clean Energy
Second Data Request
North Carolina Utilities Commission Docket No. E-7, Sub 1164
Public Service Commission of South Carolina Docket No. 2018-72-E
Item No. 2-12
Page 1 of 1

DUKE ENERGY CAROLINAS, LLC

Request:

- 2 -12. Please provide an explanation for why DEC does not make its residential Power Manager program available for customers on Time of Use, Net Metering, or Small Customer Generator tariffs.

Response:

The premise for excluding Time of Use, Net Metering, or Small Customer Generator customers from DEC Power Manager is that these customers, in theory, have taken or will take action to reduce their air conditioning load or remove it from the grid entirely during on-peak periods. Accordingly, allowing them to participate would be promoting free ridership. Time of Use customers likely take action to reduce their air conditioning load during on-peak periods, and Net Metering or Small Generator customers have likely already moved their air conditioning load from the grid.

Miller Exhibit 1, page 1

I, A

Duke Energy Carolinas, LLC
DSM/EE Cost Recovery Rider 10
Docket Number E-7 Sub 1164
Exhibit Summary for Rider EE Exhibits and Factors

Residential Billing Factors

Residential Billing Factor for Rider 10 True-up (EMF) Components

Line			Adjusted
1	Year 2014 EE/DSM True-Up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 1 Line 15	501,324
2	Year 2015 EE/DSM True-Up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 2 Line 15	(1,014,271)
3	Year 2016 EE/DSM True-Up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3 Line 15	(2,560,305)
4	Year 2017 EE/DSM True-Up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 4 Line 15	26,865,491
5	Total True-up (EMF) Revenue Requirement	Sum Lines 1-4	\$ 23,792,240
6	Projected NC Residential Sales (kWh) for rate period	Miller Exhibit 6 pg. 1, Line 1	21,806,637,265
7	EE/DSM Revenue Requirement EMF Residential Rider EE (cents per kWh)	Line 5 / Line 6 * 100	0.1091

Residential Billing Factor for Rider 10 Prospective Components

8	Vintage 2017 Total EE/DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 4, Line 1	8,904,587
9	Vintage 2018 Total EE/DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 5, Line 1	6,294,025
10	Vintage 2019 Total EE/DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 6, Line 11	77,019,869
11	Total Prospective Revenue Requirement	Sum Lines 8-11	\$ 92,218,481
12	Projected NC Residential Sales (kWh) for rate period	Miller Exhibit 6 pg. 1, Line 1	21,806,637,265
13	EE/DSM Revenue Requirement Prospective Residential Rider EE (cents per kWh)	Line 12 / Line 13 * 100	0.4229

Total Revenue Requirements in Rider 10 from Residential Customers

14	Total True-up (EMF) Revenue Requirement	Line 5	\$ 23,792,240
15	Total Prospective Revenue Requirement	Line 12	92,218,481
16	Total EE/DSM Revenue Requirement for Residential Rider EE	Line 15 + Line 16	\$ 116,010,721
17	Total EE/DSM Revenue Requirement for Residential Rider EE (cents per kWh)	Line 7 + Line 14	0.5320

Non-Residential Billing Factors for Rider 10 True-up (EMF) Components

18	Vintage Year 2014 EE True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 1, Line 25	\$ (1,154,814)
19	Projected Year 2014 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 4	18,259,714,025
20	EE Revenue Requirement Year 2014 EMF Non-Residential Rider EE (cents per kWh)	Line 19/Line 20 * 100	(0.0063)
21	Vintage Year 2014 DSM True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 1, Line 35	\$ (39,246)
22	Projected Year 2014 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 5	18,062,882,364
23	DSM Revenue Requirement Year 2014 EMF Non-Residential Rider EE (cents per kWh)	Line 22/Line 23 * 100	(0.0002)
24	Vintage Year 2015 EE True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 2, Line 25	\$ 456,319
25	Projected Year 2015 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 6	18,134,510,475
26	EE Revenue Requirement Year 2015 EMF Non-Residential Rider EE (cents per kWh)	Line 25/Line 26 * 100	0.0025
27	Vintage Year 2015 DSM True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 2, Line 35	\$ (451,445)
28	Projected Year 2015 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 7	17,851,357,712
29	DSM Revenue Requirement Year 2015 EMF Non-Residential Rider EE (cents per kWh)	Line 28/Line 29 * 100	(0.0025)
30	Vintage Year 2016 EE True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3, Line 35	\$ (2,329,721)
31	Projected Year 2016 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 8	17,849,972,518
32	EE Revenue Requirement Year 2016 EMF Non-Residential Rider EE (cents per kWh)	Line 31/Line 32 * 100	(0.0131)
33	Vintage Year 2016 DSM True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3, Line 35	\$ (267,721)
34	Projected Year 2016 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 9	17,559,238,943
35	DSM Revenue Requirement Year 2016 EMF Non-Residential Rider EE (cents per kWh)	Line 34/Line 35 * 100	(0.0015)

Miller Exhibit 1, page 2

36	Vintage Year 2017 EE True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3, Line 35	\$	53,163,097
37	Projected Year 2017 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 8		17,531,615,286
38	EE Revenue Requirement Year 2017 EMF Non-Residential Rider EE (cents per kWh)	Line 37/Line 38 * 100		0.3032
39	Vintage Year 2017 DSM True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3, Line 35	\$	86,311
40	Projected Year 2017 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 9		17,525,161,418
41	DSM Revenue Requirement Year 2017 EMF Non-Residential Rider EE (cents per kWh)	Line 40/Line 41 * 100		0.0005

Non-Residential Billing Factors for Rider 10 Prospective Components

42	Vintage Year 2017 EE Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 4, Line 18	\$	14,570,381
43	Projected Program Year 2017 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 10		17,531,615,286
44	EE Revenue Requirement Vintage 2017 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 42/Line 43 * 100		0.0831
45	Vintage Year 2018 EE Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 5, Line 25	\$	12,285,044
46	Projected Vintage 2018 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 12		16,997,418,314
47	EE Revenue Requirement Vintage 2018 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 45/Line 46 * 100		0.0723
48	Vintage Year 2018 DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 5, Line 25	\$	534,763
49	Projected Vintage 2018 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 12		17,422,191,737
50	DSM Revenue Requirement Vintage 2018 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 48/Line 49 * 100		0.0031
51	Vintage Year 2019 EE Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 6, Line 25	\$	55,797,199
52	Projected Vintage 2019 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 13		16,997,418,314
53	EE Revenue Requirement Vintage 2019 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 51/Line 52 * 100		0.3283
54	Vintage Year 2019 DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 6, Line 25	\$	15,847,512
55	Projected Vintage 2019 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 13		17,422,191,737
56	DSM Revenue Requirement Vintage 2019 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 54/Line 55 * 100		0.0910
	Total EMF Rate			0.2826
	Total Prospective Rate			0.5778

Total Revenue Requirements in Rider 10 from Non-Residential Customers

57	Vintage Year 2014 EE True-up (EMF) Revenue Requirement	Line 18		(1,154,814)
58	Vintage Year 2014 DSM True-up (EMF) Revenue Requirement	Line 21		(39,246)
59	Vintage Year 2015 EE True-up (EMF) Revenue Requirement	Line 24		456,319
60	Vintage Year 2015 DSM True-up (EMF) Revenue Requirement	Line 27		(451,445)
61	Vintage Year 2016 EE True-up (EMF) Revenue Requirement	Line 30		(2,329,721)
62	Vintage Year 2016 DSM True-up (EMF) Revenue Requirement	Line 33		(267,721)
63	Vintage Year 2017 EE True-up (EMF) Revenue Requirement	Line 36		53,163,097
64	Vintage Year 2017 DSM True-up (EMF) Revenue Requirement	Line 39		86,311
65	Vintage Year 2017 EE Prospective Amounts Revenue Requirement	Line 42		14,570,381
66	Vintage Year 2018 EE Prospective Amounts Revenue Requirement	Line 45		12,285,044
67	Vintage Year 2018 DSM Prospective Amounts Revenue Requirement	Line 48		534,763
67	Vintage Year 2019 EE Prospective Amounts Revenue Requirement	Line 51		55,797,199
68	Vintage Year 2019 DSM Prospective Amounts Revenue Requirement	Line 54		15,847,512
	Total Non-Residential Revenue Requirement in Rider 10	Sum (Lines 57-68)	\$	148,497,678

Miller Exhibit 2, page 1

I/A

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
True up Year 1, 2, 3 and 4 for Vintage Year 2014

RESIDENTIAL Energy Efficiency Programs

Line	Reference
1 Residential EE Program Cost	Evans Exhibit 1 pg. 1, Line 10 * NC Alloc. Factor
2 Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 1, Line 10 * NC Alloc. Factor
3 Return on undercollection of Residential EE Program Costs	Miller Exhibit 3 pg. 1
4 Total EE Program Cost and Incentive Components	Line 1 + Line 2 + Line 3
5 Residential DSM Program Cost	Evans Exhibit 1 pg. 1, Line 11 * NC Alloc. Factor
6 Residential DSM Earned Utility Incentive	Evans Exhibit 1 pg. 1, Line 11 * NC Alloc. Factor
7 Return on overcollection of Residential DSM Program Costs	Miller Exhibit 3 pg. 2
8 Total DSM Program Cost and Incentive Components	Line 5 + Line 6 + Line 7
9 Total EE/DSM Program Cost and Incentive Components	Line 4 + Line 8
10 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7
11 Total EE/DSM Program Cost and Incentive Revenue Requirement	Line 9 + Line 10
12 Residential Net Lost Revenues	Evans Exhibit 2 pg. 1
13 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12
14 Total Collected for Vintage Year 2014 (through estimated Rider 9)	Miller Exhibit 4 Line 1
15 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12

E-7 Sub 1031	E-7 Sub 1050	E-7 1073	E-7 Sub 1073	E-7 Sub 1105	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1164	
Rider 5 Original Estimate	Rider 6 Year 2 Lost Revenue Estimate	Rider 7 - True up of Year 1	Rider 7 - Estimate of Year 3 Lost Revenue	Rider 8 - True up of Lost Revenues and EM&V	Rider 8 - Estimate of Year 4 Lost Revenues	Rider 9 True up	Rider 10 True up	Year 2014
\$ 29,754,660		\$ (1,844,170)		\$ 1		\$ (0)	\$ -	\$ 27,910,491
2,242,156		2,715,537		88,645		274	(273)	5,046,339
		53,935		140,851		71,702	(706)	265,782
31,996,816		925,302		229,497		71,976	(979)	33,222,612
13,143,935		(2,535,104)		(0)		-	-	10,608,831
3,240,520		(12,767)		(25,251)		(0)	-	3,202,502
		(69,597)		(136,468)		(64,670)	10,071	(260,664)
16,384,455		(2,617,468)		(161,719)		(64,670)	10,071	13,550,668
48,381,271		(1,692,166)		67,778		7,306	9,091	46,773,280
1,017,953		1,001,442		1,001,402		1,001,402	1,001,402	
49,249,860		(1,694,606)		67,873		7,316	9,104	47,639,547
8,435,982	3,810,949	3,065,327	9,895,892	6,287,758	5,005,380	217,145	207,005	36,925,438
57,685,842	3,810,949	1,370,721	9,895,892	6,355,631	5,005,380	224,462	216,109	84,564,985
								84,063,661
								\$ 501,324

See Miller Exhibit A for rate

NON-RESIDENTIAL Energy Efficiency Programs

Line	Reference
16 Non-Residential EE Program Cost	Evans Exhibit 1 pg. 1, Line 24 * NC Alloc. Factor
17 Non-Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 1, Line 24 * NC Alloc. Factor
18 Return on undercollection of Non-residential EE Program Costs	Miller Exhibit 3 page 3A
19 Total EE Program Cost and Incentive Components	Line 16 + Line 17 + Line 18
20 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7
21 Total Non-Residential EE Program Cost and Incentive Revenue Requirements	Line 19 + Line 20
22 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 1
23 Total Non-Residential EE Revenue Requirement	Line 21 + Line 22
24 Total Collected for Year 2014 (through Estimated Rider 9)	Miller Exhibit 4 Line 7
25 Non-Residential EE Revenue Requirement True-Up Amount	Line 23 - Line 24
26 Projected NC Residential Sales (KWh)	Miller Exhibit 6, pg. 1, Line 4
27 NC Non-Residential EE billing factor (Cents/KWh)	Line 25/Line 26*100

E-7 Sub 1031	E-7 Sub 1050	E-7 1073	E-7 Sub 1073	E-7 Sub 1105	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1164	
Rider 5 Original Estimate	Rider 6 Year 2 Lost Revenue Estimate	Rider 7 - True up of Year 1	Rider 7 - Estimate of Year 3 Lost Revenue	Rider 8 - True up of Lost Revenues & EM&V	Rider 8 - Estimate of Year 4 Lost Revenues	Rider 9 True up	Rider 10 True up	Year 2014
16,206,358		(1,398,648)		-		1	-	14,807,711
5,782,942		2,021,277		35,872		45,754	(121,883)	7,763,962
		94,850		130,948		73,379	(7,112)	292,065
21,989,300		717,479		166,820		119,134	(128,995)	22,863,738
1,017,953		1,001,442		1,001,402		1,001,402	1,001,402	
22,384,074		718,514		167,054		119,301	(129,176)	23,259,766
1,831,641	4,837,353	1,222,389	6,094,150	1,203,734	3,150,271	(853,990)	(1,483,604)	16,001,944
24,215,715	4,837,353	1,940,903	6,094,150	1,370,788	3,150,271	(734,689)	(1,612,780)	39,261,710
								40,416,525
								(1,154,814)
								18,259,714,025
								(0.0063)

DSM Programs

Line	Reference
28 Non-Residential DSM Program Cost	Evans Exhibit 1, pg. 1 Line 25 * NC Alloc. Factor
29 Non-Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 1 Line 25 * NC Alloc. Factor
30 Return on overcollection of Non-residential DSM Program Costs	Miller Exhibit 3 page 4
31 Total Non-Residential DSM Program Cost and Incentive Components	Line 28 + Line 29 + Line 30
32 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7
33 Total Non-Residential DSM Revenue Requirement	Line 31 + Line 32
34 Total Collected for Year 2014 (through Estimated Rider 9)	Miller Exhibit 4 Line 12
35 Non-Residential DSM Revenue Requirement True up Amount	Line 33- Line 34
36 Projected NC Non-Residential Sales (KWh)	Miller Exhibit 6 pg. 2, Line 5
37 NC Non-Residential DSM billing factor	Line 35/Line 36*100

E-7 Sub 1031	E-7 1073	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1164	
Rider 5 Original Estimate	Rider 7 - True up of Year 1	Rider 8 - True up	Rider 9 True up	Rider 10 True up	Year 2014
15,046,160	(2,195,319)	(0)	-	-	12,850,841
3,709,497	200,391	(30,588)	-	-	3,879,300
	(19,939)	(82,394)	(52,597)	(18,476)	(173,406)
18,755,657	(2,014,867)	(112,982)	(52,597)	(18,476)	16,556,735
1,017,953	1,001,442	1,001,402	1,001,402	1,001,402	
19,092,377	(2,017,772)	(113,141)	(52,671)	(18,502)	16,890,292
					16,929,538
					(39,246)
					18,062,882,364
					(0.0002)

** Actual regulatory fee rate in effect in year of collection. May differ from original filed estimates.

Miller Exhibit 2, page 2

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
True Up of Year 1, 2 and 3 of Vintage Year 2015**RESIDENTIAL**
Energy Efficiency Programs

Line

Reference

- 1 Residential EE Program Cost
2 Residential EE Earned Utility Incentive
3 Return on undercollection of Residential EE Program Costs
4 Total EE Program Cost and Incentive Components
5 Residential DSM Program Cost
6 Residential DSM Earned Utility Incentive
7 Return on undercollection of Residential DSM Program Costs
8 Total DSM Program Cost and Incentive Components
9 Total EE/DSM Program Cost and Incentive Components
10 Revenue-related taxes and regulatory fees factor **
11 Total EE/DSM Program Cost and Incentive Revenue Requirement
12 Residential Net Lost Revenues
13 Total Residential EE/DSM Revenue Requirement
14 Total Collected for Vintage Year 2015 (through estimated Rider 9)
15 Total Residential EE/DSM Revenue Requirement

Evans Exhibit 1 pg. 2, Line 10 * NC Alloc. Factor
Evans Exhibit 1 pg. 2, Line 10 * NC Alloc. Factor
Miller Exhibit 3 pg. 5
Line 1 + Line 2 + Line 3
Evans Exhibit 1 pg. 2, Line 11 * NC Alloc. Factor
Evans Exhibit 1 pg. 2, Line 11 * NC Alloc. Factor
Miller Exhibit 3 pg. 6
Line 5 + Line 6 + Line 7
Line 4 + Line 8
Miller Exhibit 2, pg. 7
Line 9 * Line 10
Evans Exhibit 2 pg. 1
Line 11 + Line 12
Miller Exhibit 4 Line 2
Line 11 + Line 12

E-7 Sub 1050	E-7 Sub 1073	E-7 Sub 1105	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1130	E-7 Sub 1164	
Rider 6 Original Estimate	Rider 7 Year 2 Lost Revenues	Rider 8 True up of Year 1	Rider 8 Year 3 Lost Revenues	Rider 9 True up of Lost Revenues & EM&V	Rider 9 Year 4 LR Estimate	Rider 10 True up	Year 2015 Year 1
\$ 30,685,449		\$ (2,726,335)		\$ -		\$ -	\$ 27,959,114
2,374,641		2,431,922		125,671		(0)	4,932,234
		49,064		77,792		35,939	162,795
33,060,090		(245,348)		203,463		85,938	33,054,143
12,532,432		(2,197,589)		(1,252)		(0)	10,334,843
3,275,217		(676,007)		(12,280)		(532)	2,586,398
		(10,786)		23,451		11,838	24,503
15,807,649		(2,824,381)		9,919		11,305	19,004,492
48,867,739		(3,069,780)		213,982		47,244	46,098,635
1,001,417		1,001,402		1,001,402		1,001,402	
48,936,985		(3,074,034)		213,681		47,310	46,128,942
9,169,840	4,071,955	5,563,184	8,090,565	4,391,232	9,431,636	(1,396,510)	35,181,702
58,106,825	4,071,955	2,489,151	8,090,565	4,404,913	3,431,636	(1,289,200)	79,305,645
							80,319,916
							(\$ 1,014,271)

See Miller Exhibit A for rate

NON-RESIDENTIAL
Energy Efficiency Programs

- 16 Non-Residential EE Program Cost
17 Non-Residential EE Earned Utility Incentive
18 Return on undercollection of Non-residential EE Program Costs
19 Total EE Program Cost and Incentive Components
20 Revenue-related taxes and regulatory fees factor
21 Total Non-Residential EE Program Cost and Incentive Revenue Requirements
22 Non-Residential Net Lost Revenues
23 Total Non-Residential EE Revenue Requirement
24 Total Collected for Year 2015 (through estimated Rider 9)
25 Non-Residential EE Revenue Requirement
26 Projected NC Residential Sales (kWh)
27 NC Non-Residential EE billing factor (Cents/kWh)

Evans Exhibit 1 pg. 2, Line 24 * NC Alloc. Factor
Evans Exhibit 1 pg. 2, Line 24 * NC Alloc. Factor
Miller Exhibit 3 page 7
Line 16 + Line 17 + Line 18
Miller Exhibit 2, pg. 7
Line 19 * Line 20
Evans Exhibit 2 pg. 4
Line 21 + Line 22
Miller Exhibit 4 Line 6
Line 23 - Line 24
Miller Exhibit 5, pg. 2, Line 6
Line 25/Line 26*100

E-7 Sub 1050	E-7 Sub 1073	E-7 Sub 1105	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1130	E-7 Sub 1164	
Rider 6 Original Estimate	Rider 7 Year 2 Lost Revenues	Rider 8 True up of Year 1	Rider 8 Year 3 Lost Revenues	Rider 9 True up of Lost Revenues & EM&V	Year 2015 Year 4 LR Estimate	Rider 10 True Up	Year 2015 Year 1
17,548,807		11,904,051		0		-	29,232,958
6,214,226		8,351,028		846,899		(594,998)	9,817,155
		457,891		838,299		448,915	1,744,505
23,563,033		15,712,970		1,685,198		(146,883)	40,814,518
1,001,417		1,001,402		1,001,402		1,001,402	
23,596,422		15,735,000		1,687,561		(146,889)	40,872,094
2,579,480	8,194,003	2,547,914	9,483,428	2,426,543	4,183,188	(5,671,147)	25,667,409
76,119,902	8,194,003	18,282,914	9,483,428	4,114,104	4,183,188	(3,818,036)	66,108,184
							456,319
							18,194,520,475
							0.0025

DSM Programs

- 28 Non-Residential DSM Program Cost
29 Non-Residential DSM Earned Utility Incentive
30 Return on overcollection of Non-residential DSM Program Costs
31 Total Non-Residential DSM Program Cost and Incentive Components
32 Revenue-related taxes and regulatory fees factor
33 Total Non-Residential DSM Revenue Requirement
34 Total Revenue Collected for DSM Programs Year 2015 (through estimated Rider 9)
35 Non-Residential EE Revenue Requirement True-up Amount
36 Projected NC Non-Residential Sales (kWh)
37 NC Non-Residential DSM billing factor

Evans Exhibit 1, pg. 2 Line 25 * NC Alloc. Factor
Evans Exhibit 1, pg. 2 Line 25 * NC Alloc. Factor
Miller Exhibit 3 page 8
Line 28 + Line 29 + Line 30
Miller Exhibit 2, pg. 7
Line 31 * Line 32
Miller Exhibit 4 Line 10
Line 33- Line 34
Miller Exhibit 6 pg. 1, Line 7
Line 35/Line 36*100

E-7 Sub 1050	E-7 Sub 1050	E-7 Sub 1130	E-7 Sub 1164	
Rider 6 Original Estimate	Rider 8 Original True Up	Rider 9 True Up	Rider 10 True Up	Year 2015 Year 1
16,493,468	(2,925,873)	(1,635)		19,565,981
4,310,397	(917,841)	(16,029)	(693)	3,375,833
	(107,297)	(203,063)	(128,531)	(438,897)
20,803,865	(3,951,013)	(220,731)	(129,225)	16,502,917
1,001,417	1,001,402	1,001,402	1,001,402	
20,833,364	(3,956,590)	(221,042)	(129,406)	16,526,366
				16,977,811
				(451,445)
				17,851,857,732
				(0.0025)

** Actual regulatory fee rate in effect in year of collection. May differ from original filed estimates.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Year 4 Lost Revenue and True Up of Year 1 and 2 for Vintage Year 2016

RESIDENTIAL
Energy Efficiency Programs

Line	Reference	E-7 Sub 1079 Rider 7 Original Estimate	E-7 Sub 1105 Rider 8 Year 2 Lost Revenues	E-7 Sub 1150 Rider 9 True up	E-7 Sub 1150 Year 2016 Yr 3 LR Estimate	E-7 Sub 1164 Rider 10 True up	Year 2016 Year 1
1 Residential EE Program Cost	Evans Exhibit 1 pg. 3, Line 10 * NC Alloc. Factor	\$ 31,056,079		\$ 8,965,024		\$ (2)	\$ 40,021,101
2 Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 3, Line 10 * NC Alloc. Factor	2,392,652		4,361,799		(52,098)	6,702,353
3 Return on undercollection of Residential EE Program Costs	Miller Exhibit 3 pg 5			272,476		710,786	983,262
4 Total EE Program Cost and Incentive Components	Line 1 + Line 2 + Line 3	33,448,731		19,539,299		658,686	47,706,716
5 Residential DSM Program Cost	Evans Exhibit 1 pg. 3, Line 11 * NC Alloc. Factor	10,613,018		(1,012,441)		0	9,600,575
6 Residential DSM Earned Utility Incentive	Evans Exhibit 1 pg. 3, Line 11 * NC Alloc. Factor	2,887,418		(129,612)		(27,890)	2,729,916
7 Return on overcollection of Residential DSM Program Costs	Miller Exhibit 3 pg 6			(26,372)		(46,199)	(72,521)
8 Total DSM Program Cost and Incentive Components	Line 5 + Line 6 + Line 7	13,500,434		(1,168,375)		(74,089)	12,257,971
9 Total EE/DSM Program Cost and Incentive Components	Line 4 + Line 8	46,949,165		12,490,924		584,598	59,964,687
10 Revenue-related taxes and regulatory fees factor **	Miller Exhibit 2, pg. 7	1,001,442		1,001,402		1,001,402	
11 Total EE/DSM Program Cost and Incentive Revenue Requirement	Line 9 + Line 10	47,016,866		12,448,952		585,417	60,050,635
12 Residential Net Lost Revenues	Evans Exhibit 2, pg. 4	11,879,767	5,723,916	4,795,559	7,765,923	(3,299,616)	26,858,729
13 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12	58,890,633	5,723,916	17,243,711	7,765,923	(2,714,199)	86,809,384
14 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 2						89,469,689
15 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12						\$ (2,560,305)

See Miller Exhibit A for rate

NON-RESIDENTIAL
Energy Efficiency Programs

Line	Reference	E-7 Sub 1079 Rider 7 Original Estimate	E-7 Sub 1105 Rider 8 Year 2 Lost Revenues	E-7 Sub 1150 Rider 9 True up	E-7 Sub 1150 Year 2016 Yr 3 LR Estimate	E-7 Sub 1164 Rider 10 True up	Year 2016 Year 1
16 Non-Residential EE Program Cost	Evans Exhibit 1 pg. 3, Line 25 * NC Alloc. Factor	96,494,611		19,515,376		1	50,009,988
17 Non-Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 3, Line 25 * NC Alloc. Factor	10,105,721		4,261,607		(353,368)	14,013,960
18 Return on undercollection of Non-residential EE Program Costs	Miller Exhibit 3 page 7			378,293		1,051,375	1,429,668
19 Total EE Program Cost and Incentive Components	Line 16 + Line 17 + Line 18	46,600,332		18,155,276		698,008	65,453,616
20 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1,001,442		1,001,402		1,001,402	
21 Total Non-Residential EE Program Cost and Incentive Revenue Requirements	Line 19 + Line 20	46,667,530		18,190,730		698,987	65,547,246
22 Non-Residential Net Lost Revenues	Evans Exhibit 2, pg. 4	4,745,315	8,309,444	2,524,047	13,975,187	(4,085,026)	24,868,967
23 Total Non-Residential EE Revenue Requirement	Line 21 + Line 22	51,412,845	8,309,444	20,704,776	13,975,187	(3,386,039)	90,415,213
24 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 6						92,745,934
25 Non-Residential EE Revenue Requirement	Line 23 + Line 24						(2,329,721)
26 Projected NC Residential Sales (kWh)	Miller Exhibit 6, pg. 1, Line 8						17,849,972,918
27 NC Non-Residential EE billing factor (Cents/kWh)	Line 25/Line 26*100						(0.0131)

DSM Programs

Line	Reference	E-7 Sub 1079 Rider 7 Original Estimate	E-7 Sub 1150 Rider 9 True up	E-7 Sub 1164 Rider 10 True up	Year 2016 Year 1
28 Non-Residential DSM Program Cost	Evans Exhibit 1, pg. 3 Line 26 * NC Alloc. Factor	12,855,910	(1,261,413)	0	11,594,497
29 Non-Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 3 Line 26 * NC Alloc. Factor	3,497,628	(167,059)	(33,683)	3,296,886
30 Return on undercollection of Non-residential DSM Program Costs	Miller Exhibit 3 page 8		1,759	3,420	5,179
31 Total Non-Residential DSM Program Cost and Incentive Components	Line 28 + Line 29 + Line 30	16,353,538	(1,426,713)	(30,263)	14,896,563
32 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1,001,442	1,001,402	1,001,402	
33 Total Non-Residential DSM Revenue Requirement	Line 31 + Line 32	16,377,120	(1,428,715)	(30,305)	14,918,102
34 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 10				15,185,813
35 Non-Residential EE Revenue Requirement True-up Amount	Line 33 - Line 34				(267,711)
36 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6 pg. 1, Line 9				17,559,238,948
37 NC Non-Residential DSM billing factor	Line 35/Line 36*100				(0.0015)

* Year 4 Projected Lost Revenue is not being requested in this filing because lost revenue through the test period of Docket E7 Sub XXXX was requested as part of base rates.
** Actual regulatory fee rate in effect in year of collection. May differ from original filed estimates.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Year 3 Lost Revenue and True Up of Year 1 and 2 for Vintage Year 2017

RESIDENTIAL Energy Efficiency Programs

Line	Reference	Year 2017 Yr 3 LR Estimate
1 Residential EE Program Cost	Evans Exhibit 1 pg. 4, Line 10 * NC Alloc. Factor	
2 Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 4, Line 10 * NC Alloc. Factor	
3 Return on undercollection of Residential EE Program Costs	Miller Exhibit 3 pg 5	
4 Total EE Program Cost and Incentive Components	Line 1 + Line 2 + Line 3	
5 Residential DSM Program Cost	Evans Exhibit 1 pg. 4, Line 11 * NC Alloc. Factor	
6 Residential DSM Earned Utility Incentive	Evans Exhibit 1 pg. 4, Line 11 * NC Alloc. Factor	
7 Return on undercollection of Residential DSM Program Costs	Miller Exhibit 3 pg 6	
8 Total DSM Program Cost and Incentive Components	Line 5 + Line 6 + Line 7	
9 Total EE/DSM Program Cost and Incentive Components	Line 4 + Line 8	
10 Revenue-related taxes and regulatory fees factor **	Miller Exhibit 2, pg. 7	
11 Total EE/DSM Program Cost and Incentive Revenue Requirement	Line 9 * Line 10	
12 Residential Net Lost Revenues	Evans Exhibit 2 pg. 2	\$ 8,904,587
13 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12	8,904,587
14 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 2	
15 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12	\$ 8,904,587

E-7 Sub 1105 Rider 8 Year 1 Estimate	E-7 Sub 1130 Year 2017 Yr 2 LR Estimate	E-7 Sub 1164 Rider 10 True up	Year 2017 Year 1
\$ 33,488,974		\$ 13,998,885	\$ 47,487,859
4,149,244		4,340,033	8,489,277
		522,611	522,611
37,638,218		18,861,529	56,499,747
10,258,751		(176,455)	10,082,296
2,837,134		89,061	2,926,195
		15,015	15,015
19,095,885		(72,379)	19,023,506
50,734,103		18,783,151	69,517,254
1,001,482		1,001,402	
50,809,291		18,815,493	69,624,784
12,639,119	4,202,002	6,456,128	23,357,250
63,508,411	4,202,002	25,271,622	92,982,034
			65,116,542
			\$ 26,865,491

See Miller Exhibit A for rate

NON-RESIDENTIAL Energy Efficiency Programs

Line	Reference	Year 2017 Yr 3 LR Estimate
16 Non-Residential EE Program Cost	Evans Exhibit 1 pg. 4, Line 25 * NC Alloc. Factor	
17 Non-Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 4, Line 25 * NC Alloc. Factor	
18 Return on undercollection of Non-Residential EE Program Costs	Miller Exhibit 3 page 7	
19 Total EE Program Cost and Incentive Components	Line 16 + Line 17 + Line 18	
20 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	
21 Total Non-Residential EE Program Cost and Incentive Revenue Requirements	Line 19 * Line 20	
22 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 2	14,570,381
23 Total Non-Residential EE Revenue Requirement	Line 21 + Line 22	14,570,381
24 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 6	
25 Non-Residential EE Revenue Requirement	Line 23 - Line 24	14,570,381
26 Projected NC Residential Sales (kWh)	Miller Exhibit 6, pg. 1, Line 8	17,531,615,286
27 NC Non-Residential EE billing factor (Cents/kWh)	Line 25/Line 26 *100	0.0831

E-7 Sub 1105 Rider 8 Year 1 Estimate	E-7 Sub 1130 Year 2017 Yr 2 LR Estimate	E-7 Sub 1164 Rider 10 True up	Year 2017 Year 1
38,791,601		32,155,814	70,947,415
9,947,504		9,073,249	18,420,747
		1,588,165	1,588,165
48,139,105		42,817,241	90,956,346
1,001,482		1,001,402	
48,210,447		42,877,271	91,087,718
6,039,892	9,466,867	2,627,210	18,133,969
54,250,339	9,466,867	45,504,481	109,221,688
			56,058,591
			53,163,097
			17,531,615,286
			0.0832

DSM Programs

Line	Reference	Year 2017 Yr 3 LR Estimate
28 Non-Residential DSM Program Cost	Evans Exhibit 1, pg. 4 Line 26 * NC Alloc. Factor	
29 Non-Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 4 Line 26 * NC Alloc. Factor	
30 Return on undercollection of Non-Residential DSM Program Costs	Miller Exhibit 3 page 8	
31 Total Non-Residential DSM Program Cost and Incentive Components	Line 28 + Line 29 + Line 30	
32 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 13	
33 Total Non-Residential DSM Revenue Requirement	Line 31 * Line 32	
34 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 10	
35 Non-Residential EE Revenue Requirement True-up Amount	Line 33- Line 34	
36 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6 pg. 1, Line 9	
37 NC Non-Residential DSM billing factor	Line 35/Line 36 *100	

E-7 Sub 1105 Rider 8 Year 1 Estimate	E-7 Sub 1164 Rider 10 True Up	Year 2017 Year 1
13,589,385	(1,438,646)	11,951,339
3,703,101	(234,452)	3,468,649
	4,793	4,761
17,093,086	(1,668,937)	15,424,749
1,001,482	1,001,402	
17,118,418	(1,670,676)	15,447,742
		15,361,431
		86,311
		17,525,151,418
		0.0009

** Actual regulatory fee rate in effect in year of collection. May differ from original filed estimates.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Year 2 Lost Revenues for Vintage Year 2018

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Mar 07 2018

RESIDENTIAL

Line

	Reference	2018
1 Residential Net Lost Revenues	Evans Exhibit 2 pg. 3 Line 115	6,294,025
2 Projected NC Residential Sales (kWh)	Miller Exhibit 6 pg 1	\$ 21,806,637,265
3 NC Residential EE Billing Factor (Cents/kWh)	Line 1/Line 2*100	0.0289

NON-RESIDENTIAL

Energy Efficiency Programs

	Reference	2018
4 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 3 Line 131	10,271,966
5 Impact of Revised Forecast from Rider 9	Miller Exhibit 7 pg 1	2,013,078
6 Total Revenue Requirement	Line 4 + Line 5	12,285,044
7 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6 pg 1	16,997,418,314
8 NC Non-Residential EE billing factor (Cents/kWh)	Line 6/Line 7*100	0.0723

Demand Side Management

	Reference	2018
9 Impact of Revised Forecast from Rider 9	Miller Exhibit 7 page 1	534,763
10 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6 pg 1	17,422,191,737
11 NC Non-Residential EE billing factor (Cents/kWh)	Line 9/Line 10*100	0.0031

Miller Exhibit 2, page 6

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Program Costs, Earned Incentive and Lost Revenues for Vintage Year 2019

RESIDENTIAL

Line	Reference	2019
1 Residential EE Program Cost	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	\$ 41,002,874
2 Residential EE Earned Utility Incentive	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	3,801,819
3 Total EE Program Cost and Incentive Components	Line 1 + Line 2, Evans Exhibit 1, Line 10	44,804,694
4 Residential DSM Program Cost	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	10,577,352
5 Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	2,773,086
6 Total DSM Program Cost and Incentive Components	Line 4 + Line 5, Evans Exhibit 1, Line 11	13,350,438
7 Total EE/DSM Program Cost and Incentive Components	Line 3 + Line 6	58,155,132
8 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1.001402
9 Total EE/DSM Program Cost and Incentive Revenue Requirement	Line 7 * Line 8	58,236,665
10 Residential Net Lost Revenues	Evans Exhibit 2 pg. 3 Line 141	18,783,204
11 Total Residential EE Revenue Requirement	Line 9 + Line 10	\$ 77,019,869

See Miller Exhibit 1
for rate

NON-RESIDENTIAL
Energy Efficiency Programs

	Reference	2019
12 Non-Residential EE Program Cost	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	\$ 41,671,833
13 Non-Residential EE Earned Utility Incentive	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	8,464,629
14 Total EE Program Cost and Incentive Components	Line 12 + Line 13, Evans Exhibit 1, Line 25	50,136,461
15 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1.001402
16 Total Non-Residential EE Program Cost and Incentive Revenue Requirements	Line 14 * Line 15	50,206,753
17 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 3 Line 157	5,590,446
18 Total Non-Residential EE Revenue Requirement	Line 16 + Line 17	\$ 55,797,199
19 Projected NC Residential Sales (kWh)	Miller Exhibit 6, pg. 1, Line 12	16,997,418,314
20 NC Non-Residential EE billing factor (Cents/kWh)	Line 18/Line 19*100	0.3283

DSM Programs

		2019
21 Non-Residential DSM Program Cost	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	\$ 12,538,168
22 Non-Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	3,287,157
23 Total Non-Residential DSM Program Cost and Incentive Components	Line 21 + Line 22, Evans Exhibit 1, Line 26	15,825,324
24 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1.001402
25 Total Non-Residential DSM Revenue Requirement	Line 23 * Line 24	15,847,512
26 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6, pg. 1, Line 13	17,422,191,737
27 NC Non-Residential DSM billing factor	Line 25/Line 26*100	0.0910

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Gross Receipts Tax Years 2014 through estimated 2019

	<u>Year</u>		<u>Actual GRT Rate In Effect</u>
	2014	Jan - June	1.034554
		July - Dec	1.001352
Rider 5	2014	Weighted Average	1.017953
	2015	Jan - June	1.001352
		July - Dec	1.001482
Rider 6	2015	Weighted Average	1.001417
Rider 7	2016	Jan - June	1.001482
		July - Dec	1.001402
		Weighted Average	1.001442
Rider 8	2017		1.001402
Rider 9	2018		1.001402
Rider 10	2019		1.001402

Note: the current rate is used as the estimate for 2018 and 2019. This will be subject to true-up based on actual rates in effect.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Residential EE Programs Vintage 2014

I/A

NC Residential EE	Residential EE Program Costs		NC Allocated EE Program Costs	updated with formula for Jan.		EE Program Costs Revenue Collected	(Over)/Under Collection
	Incurred	NC Allocation %		NC Residential Revenue Collected(EEC2)	NC Residential EE Program Collection %		
		Miller Exhibit 5 pg. 1, Line 4					
Beginning Balance - source I	38,254,486	72.9600473%	27,910,491			27,922,190	(11,699)
2017 January		72.9600473%	-	456,980	0.0000000%	-	-
2017 February		72.9600473%	-	894,734	0.0000000%	-	-
2017 March		72.9600473%	-	817,236	0.0000000%	-	-
2017 April		72.9600473%	-	782,342	0.0000000%	-	-
2017 May		72.9600473%	-	725,054	0.0000000%	-	-
2017 June		72.9600473%	-	920,551	0.0000000%	-	-
2017 July		72.9600473%	-	1,138,653	0.0000000%	-	-
2017 August		72.9600473%	-	1,121,938	0.0000000%	-	-
2017 September		72.9600473%	-	974,420	0.0000000%	-	-
2017 October		72.9600473%	-	760,766	0.0000000%	-	-
2017 November		72.9600473%	-	741,359	0.0000000%	-	-
2017 December		72.9600473%	-	1,909,929	0.0000000%	-	-
				11,243,963			(11,699)

Program Cost Allocation Calculation

At the end of 2016, we still had an overcollected balance of (11,699) in program costs. Therefore, we did not give back that overcollection until Rider 9 (filed at the beginning of 2017) and we will pay that in 2018 and true that up in 2019. Interest continues to be calculated on the beginning balance.

NC Residential EE	Cumulative		Monthly		Cumulative		Net Deferred		Monthly A/T		Gross up of		Gross up of Return to	
	(Over)/Under Recovery	Current Income Tax Rate	Deferred Income Tax	Deferred Income Tax	Deferred Income Tax	After Tax Balance	Monthly Return	Return on Deferral	YTD After Tax Interest	Return to Pretax Rate	Return to Pretax Rate	Return to Pretax Rate	Return to Pretax Rate	Return to Pretax Rate
		2017					7.03%				0.766497			
											(1-.233503)			
Beginning Balance - Rider 9	(11,699)				(4,001)	(7,698)								
2017 January	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(45)	0.766497	(59)			
2017 February	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(90)	0.766497	(118)			
2017 March	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(135)	0.766497	(177)			
2017 April	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(180)	0.766497	(235)			
2017 May	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(225)	0.766497	(294)			
2017 June	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(271)	0.766497	(353)			
2017 July	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(316)	0.766497	(412)			
2017 August	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(361)	0.766497	(471)			
2017 September	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(406)	0.766497	(530)			
2017 October	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(451)	0.766497	(588)			
2017 November	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(496)	0.766497	(647)			
2017 December	(11,699)	0.341957	-	(4,001)	(7,698)	0.005858	(45)	(45)	(541)	0.766497	(706)			
									(541)					

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Residential DSM Programs Vintage 2014

NC Residential DSM	Total System NC DSM Program Costs Incurred	NC Residential DSM Allocation %	NC Allocated DSM Residential Program Costs	NC Residential Revenue Collected(EEC2)	NC Residential DSM Program Collection %	DSM Program Costs Revenue Collected	(Over)/Under Collection
Miller Exhibit 5, pg 1 Line 9							
Beginning Balance - from RI	31,183,185	34.0209980%	10,608,831			10,446,933	161,898
2017 January		34.0209980%	-	(7,602)	0.0000000%	-	-
2017 February		34.0209980%	-	(14,885)	0.0000000%	-	-
2017 March		34.0209980%	-	(13,595)	0.0000000%	-	-
2017 April		34.0209980%	-	(13,015)	0.0000000%	-	-
2017 May		34.0209980%	-	(12,062)	0.0000000%	-	-
2017 June		34.0209980%	-	(15,314)	0.0000000%	-	-
2017 July		34.0209980%	-	(18,942)	0.0000000%	-	-
2017 August		34.0209980%	-	(18,664)	0.0000000%	-	-
2017 September		34.0209980%	-	(16,210)	0.0000000%	-	-
2017 October		34.0209980%	-	(12,656)	0.0000000%	-	-
2017 November		34.0209980%	-	(12,333)	0.0000000%	-	-
2017 December		34.0209980%	-	(31,773)	0.0000000%	-	-
				(187,053)			161,898

Program Cost Allocation Calculation

At the end of 2016, we still had an undercollected balance of 161,898 in program costs. Therefore, we did not request that undercollection until Rider 9 (filed at the beginning of 2017) and we will collect that in 2018 and true that up in 2019. Interest continues to be calculated on the beginning balance.

NC Residential DSM	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
2017										
						7.03%			0.766497	
Beginning Balance - from RI	161,898			55,362	184,945					
2017 January	161,898	0.341957	-	55,362	106,536	0.005858	854	854	0.766497	1,114
2017 February	161,898	0.341957	-	55,362	106,536	0.005858	624	1,478	0.766497	1,928
2017 March	161,898	0.341957	-	55,362	106,536	0.005858	624	2,102	0.766497	2,742
2017 April	161,898	0.341957	-	55,362	106,536	0.005858	624	2,726	0.766497	3,557
2017 May	161,898	0.341957	-	55,362	106,536	0.005858	624	3,350	0.766497	4,371
2017 June	161,898	0.341957	-	55,362	106,536	0.005858	624	3,974	0.766497	5,185
2017 July	161,898	0.341957	-	55,362	106,536	0.005858	624	4,599	0.766497	5,999
2017 August	161,898	0.341957	-	55,362	106,536	0.005858	624	5,223	0.766497	6,814
2017 September	161,898	0.341957	-	55,362	106,536	0.005858	624	5,847	0.766497	7,628
2017 October	161,898	0.341957	-	55,362	106,536	0.005858	624	6,471	0.766497	8,442
2017 November	161,898	0.341957	-	55,362	106,536	0.005858	624	7,095	0.766497	9,256
2017 December	161,898	0.341957	-	55,362	106,536	0.005858	624	7,719	0.766497	10,071
							7,719			10,071

Note 2: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Non-Residential EE Programs Vintage 2014

NC Non-Residential EE	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
		2017				7.03%			0.766497	
Beginning Balance	194,128			66,383						
2017 January	171,610	0.341957	(7,700)	58,683	112,927	0.005858	331	331	0.766497	432
2017 February	140,866	0.341957	(10,513)	48,170	92,696	0.005858	602	933	0.766497	1,217
2017 March	110,978	0.341957	(10,220)	37,950	73,029	0.005858	485	1,419	0.766497	1,851
2017 April	77,697	0.341957	(11,381)	26,569	51,128	0.005858	364	1,782	0.766497	2,325
2017 May	47,819	0.341957	(10,217)	16,352	31,467	0.005858	242	2,024	0.766497	2,641
2017 June	11,888	0.341957	(12,287)	4,065	7,823	0.005858	115	2,139	0.766497	2,791
2017 July	(26,729)	0.341957	(13,205)	(9,140)	(17,589)	0.005858	(29)	2,111	0.766497	2,754
2017 August	(64,856)	0.341957	(13,038)	(22,178)	(42,678)	0.005858	(177)	1,934	0.766497	2,523
2017 September	(155,821)	0.341957	(31,106)	(53,284)	(102,537)	0.005858	(425)	1,509	0.766497	1,968
2017 October	(437,522)	0.341957	(96,330)	(149,614)	(287,908)	0.005858	(1,144)	365	0.766497	476
2017 November	(731,828)	0.341957	(100,640)	(250,254)	(481,575)	0.005858	(2,254)	(1,889)	0.766497	(2,464)
2017 December	(1,116,422)	0.341957	(131,515)	(381,768)	(734,654)	0.005858	(3,563)	(5,451)	0.766497	(7,112)
							(5,451)			(7,112)

Vintage 2014

Interest Calculation

2016 - Rider 7	Month	NC Program Costs Incurred	Revenue Collected	Undercollected Balance	Lost Revenues	Revenue Collected	Undercollected Balance	PPI	Revenue Collected	Undercollected Balance	Total Cumulative Under/Over Collected
	January	1,023,047	496,519	526,529							526,529
	February	574,342	1,083,312	(508,970)							17,558
	March	1,493,558	983,067	510,491							528,049
	April	1,372,563	1,033,183	339,380							867,429
	May	986,529	1,046,209	(59,679)							807,750
	June	2,211,591	1,181,217	1,030,374							1,838,124
	July	1,206,428	1,200,188	5,239							1,843,363
	August	486,228	1,169,999	(683,771)							1,159,592
	September	1,899,376	1,205,640	693,736							1,853,328
	October	1,012,502	1,046,136	(33,634)							1,819,694
	November	1,078,830	969,854	108,975							1,928,669
	December	1,463,718	1,411,342	52,376							1,981,045
		14,807,712	12,826,666	1,981,045	3,054,030	2,645,448	408,582	8,199,835	7,102,823	1,097,012	3,486,639

Interest Calculation

2017 - Rider 8	Month	NC Program Costs Incurred	Revenue Collected	Undercollected Balance	Lost Revenues	Revenue Collected	Undercollected Balance	PPI	Revenue Collected	Undercollected Balance	Total Cumulative Under/Over Collected
	Beginning Balance	14,807,712	12,826,666	1,981,045	3,054,030	2,645,448	408,582	8,199,835	7,102,823	1,097,012	3,486,639
	January					480,250	(480,250)		2,856	(2,856)	3,003,534
	February					371,319	(371,319)		2,208	(2,208)	2,630,007
	March					369,316	(369,316)		2,196	(2,196)	2,258,494
	April					363,984	(363,984)		2,165	(2,165)	1,892,346
	May					367,725	(367,725)		2,187	(2,187)	1,522,435
	June					493,670	(493,670)		2,936	(2,936)	1,025,829
	July					467,167	(467,167)		2,778	(2,778)	555,884
	August					468,814	(468,814)		2,788	(2,788)	84,283
	September					439,849	(439,849)		2,616	(2,616)	(358,182)
	October					366,098	(366,098)		2,177	(2,177)	(726,457)
	November					396,930	(396,930)		2,360	(2,360)	(1,125,747)
	December				6,041,087	554,214	5,486,873	35,872	3,295	32,576	4,393,701
	YTD Balance				6,041,087	5,139,334	901,752	35,872	30,562	5,309	
	Cumulative Ending Balance	14,807,712	12,826,666	1,981,045	9,095,117	7,784,782	1,310,334	8,235,706	7,133,385	1,102,321	4,393,701

Interest Calculation

2018 - Rider9	Month	NC Program Costs Incurred	Revenue Collected	Undercollected Balance	Lost Revenues	Revenue Collected	Undercollected Balance	PPI	Revenue Collected	Undercollected Balance	Total Cumulative Over/Under Collected
Beginning Balance		14,807,712	12,826,666	1,981,045	9,095,117	7,784,782	1,310,334	8,235,706	7,133,385	1,102,321	4,393,701
January			43,595	(43,595)		144,181	(144,181)		25,149	(25,149)	4,180,776
February			142,074	(142,074)		469,880	(469,880)		81,960	(81,960)	3,486,861
March			140,530	(140,530)		464,773	(464,773)		81,069	(81,069)	2,800,489
April			136,439	(136,439)		451,243	(451,243)		78,709	(78,709)	2,134,097
May			141,323	(141,323)		467,397	(467,397)		81,527	(81,527)	1,443,849
June			159,723	(159,723)		528,249	(528,249)		92,141	(92,141)	663,737
July			169,432	(169,432)		560,362	(560,362)		97,743	(97,743)	(163,800)
August			178,218	(178,218)		589,419	(589,419)		102,811	(102,811)	(1,034,249)
September			182,406	(182,406)		603,269	(603,269)		105,227	(105,227)	(1,925,151)
October			151,584	(151,584)		501,333	(501,333)		87,446	(87,446)	(2,665,514)
November			142,012	(142,012)		469,676	(469,676)		81,924	(81,924)	(3,359,127)
December			199,580	(199,580)	5,240,160	660,070	4,580,090	45,818	115,134	(69,316)	952,066
YTD Balance		-	1,786,918	(1,786,918)	5,240,160	5,909,854	(669,694)	45,818	1,030,841	(985,023)	
Cumulative Ending Balance		14,807,712	14,613,584	194,128	14,335,277	13,694,636	640,640	8,281,524	8,164,227	117,298	

Interest Calculation

2019 - Rider10	Month	NC Program Costs Incurred	Revenue Collected	Cumulative Undercollected Balance	Lost Revenues	Revenue Collected	Cumulative Undercollected Balance	PPI	Revenue Collected	Cumulative Undercollected Balance	Total Cumulative Under/(Over) Collected Balance
Beginning Balance		14,807,712	14,613,584	194,128	14,335,277	13,694,636	640,640	8,281,524	8,164,227	117,298	952,066
January			22,517	171,610	325,395	193,321	772,714	(23,726)	(14,096)	107,668	1,051,992
February			30,744	140,866	297,791	263,954	806,551	(21,713)	(19,246)	105,200	1,052,617
March			29,887	110,978	252,849	256,596	802,804	(18,437)	(18,710)	105,473	1,019,256
April			33,281	77,697	238,855	285,735	755,924	(17,416)	(20,834)	108,892	942,513
May			29,878	47,819	195,105	256,519	694,510	(14,226)	(18,704)	113,370	855,699
June			35,931	11,888	141,357	308,483	527,384	(10,307)	(22,493)	125,556	664,828
July			38,617	(26,729)	100,272	331,539	296,117	(7,311)	(24,174)	142,419	411,807
August			38,127	(64,856)	73,945	327,340	42,723	(5,392)	(23,868)	160,895	138,761
September			37,961	(102,817)	49,104	325,908	(234,082)	(3,580)	(23,764)	181,078	(155,821)
October			32,504	(135,321)	10,262	279,059	(502,879)	(748)	(20,348)	200,678	(437,522)
November			30,959	(166,280)	(18,268)	265,792	(786,939)	1,332	(19,380)	221,390	(731,828)
December			42,926	(209,206)	-	358,540	(1,155,478)	-	(26,872)	248,262	(1,116,422)
YTD Balance		-	403,334	3,462,786	1,665,667	3,462,786	(121,525)	(121,525)	(252,490)		
Cumulative Ending Balance		14,807,712	15,016,917	(209,206)	16,001,944	17,157,422	(1,155,478)	8,159,999	7,911,737	248,262	(1,116,422)

Reconciliation to Miller Exhibit 2, page 1:

Rider 9 and Rider 10 Interest not yet collected/paid	66,267
2018 Revenues estimated but not yet collected	(104,651)
Total per Exhibit 2, page 1	(1,154,806)

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Non-Residential DSM Programs Vintage 2014

NC Non- Residential DSM	Total System NC DSM Program Costs Incurred	NC Non- Residential DSM Allocation %	NC Allocated DSM Non- Residential Program Costs	Incentives Earned & GRT remitted (Allocated based on WA of Program Costs Incurred)	Total DSM Revenue Requirement	NC Non-Residential DSM Revenue Collected(DS14)	NC Non-Residential DSM Program Collection %	Non-Residential DSM Program Costs Revenue Collected	(Over)/Under Collection
		See Miller Exhibit S pg. 1, Line 10		calculated interest on entire balance due to over- collection in total			100% used due to over-collection of entire vintage		
Beginning Balance - revenue req	31,183,185	41.2108021%	12,850,841	4,213,101	17,063,941	17,524,152	100.0000000%	(17,524,152)	(460,211)
2017 January		41.2108021%	-	-	-	(30,220)	100.0000000%	30,220	30,220
2017 February		41.2108021%	-	-	-	(22,673)	100.0000000%	22,673	22,673
2017 March		41.2108021%	-	-	-	(21,993)	100.0000000%	21,993	21,993
2017 April		41.2108021%	-	-	-	(24,926)	100.0000000%	24,926	24,926
2017 May		41.2108021%	-	-	-	(22,428)	100.0000000%	22,428	22,428
2017 June		41.2108021%	-	-	-	(26,675)	100.0000000%	26,675	26,675
2017 July		41.2108021%	-	-	-	(28,579)	100.0000000%	28,579	28,579
2017 August		41.2108021%	-	-	-	(29,327)	100.0000000%	29,327	29,327
2017 September		41.2108021%	-	-	-	(27,894)	100.0000000%	27,894	27,894
2017 October		41.2108021%	-	-	-	(24,878)	100.0000000%	24,878	24,878
2017 November		41.2108021%	-	-	-	(23,216)	100.0000000%	23,216	23,216
2017 December		41.2108021%	-	-	-	(34,412)	100.0000000%	34,412	34,412
					17,063,941	17,206,931			(142,990)

Program Cost Allocation Methodology
No program cost allocation is needed because
the vintage was overcollected in total and interest
due was calculated on the entire vintage during the entire
vintage period.
Therefore, 100% of all revenues offset the overcollected
balance.

NC Non-Residential DSM	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return 7.03%	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
Beginning Balance - from Rider 9	(460,211)			(157,972)	(302,839)	0.005850				
2017 January	(429,931)	0.341957	10,334	(147,038)	(282,952)	0.005858	(1,716)	(1,716)	0.766497	(2,239)
2017 February	(407,318)	0.341957	7,753	(139,285)	(268,033)	0.005858	(1,614)	(3,330)	0.766497	(4,344)
2017 March	(385,825)	0.341957	7,521	(131,765)	(259,560)	0.005858	(1,528)	(4,858)	0.766497	(6,337)
2017 April	(360,399)	0.341957	8,524	(123,241)	(237,158)	0.005858	(1,437)	(6,295)	0.766497	(8,213)
2017 May	(337,970)	0.341957	7,670	(115,571)	(222,399)	0.005858	(1,346)	(7,641)	0.766497	(9,969)
2017 June	(311,235)	0.341957	9,122	(106,450)	(204,846)	0.005858	(1,251)	(8,893)	0.766497	(11,602)
2017 July	(282,717)	0.341957	9,773	(96,677)	(186,040)	0.005858	(1,145)	(10,038)	0.766497	(13,095)
2017 August	(253,389)	0.341957	10,029	(86,648)	(166,741)	0.005858	(1,033)	(11,071)	0.766497	(14,444)
2017 September	(225,496)	0.341957	9,538	(77,110)	(148,386)	0.005858	(923)	(11,994)	0.766497	(15,648)
2017 October	(200,618)	0.341957	8,507	(68,603)	(132,015)	0.005858	(821)	(12,815)	0.766497	(16,719)
2017 November	(177,401)	0.341957	7,939	(60,664)	(116,738)	0.005858	(729)	(13,544)	0.766497	(17,670)
2017 December	(142,990)	0.341957	11,767	(48,896)	(94,094)	0.005858	(618)	(14,162)	0.766497	(18,476)
							(14,162)			(18,476)

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1154
Estimated Return Calculation - Residential EE Programs Vintage 2015

NC Residential EE	Residential EE Program Costs Incurred	NC Allocation %	NC Allocated EE Program Costs	NC Residential Revenue Collected (EEC2)	NC Residential EE Program Collection %	EE Program Costs Revenue Collected	(Over)/Under Collection
		Miller Exhibit 5 pg. 2, Line 4					
Beginning Balance - source	38,323,008	72.9564706%	27,959,114	45,638,078	58.8054446%	26,837,675	1,121,440
2017 January		72.9564706%	-	397,852	11.1626023%	44,411	(44,411)
2017 February		72.9564706%	-	778,964	11.1626023%	86,953	(86,953)
2017 March		72.9564706%	-	711,494	11.1626023%	79,421	(79,421)
2017 April		72.9564706%	-	681,115	11.1626023%	76,030	(76,030)
2017 May		72.9564706%	-	631,240	11.1626023%	70,463	(70,463)
2017 June		72.9564706%	-	801,441	11.1626023%	89,462	(89,462)
2017 July		72.9564706%	-	991,323	11.1626023%	110,657	(110,657)
2017 August		72.9564706%	-	976,770	11.1626023%	109,033	(109,033)
2017 September		72.9564706%	-	848,339	11.1626023%	94,697	(94,697)
2017 October		72.9564706%	-	662,330	11.1626023%	73,933	(73,933)
2017 November		72.9564706%	-	645,435	11.1626023%	72,047	(72,047)
2017 December		72.9564706%	-	1,662,804	11.1626023%	185,612	(185,612)
			27,959,114	55,427,185		27,930,394	28,721

Program Costs to be Recovered in Rider 8 1,121,440
Revenues to be Collected in Rider 8 10,046,407
% Revenue to be assigned to Program Costs 0.1116

NC Residential EE	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
		2017				7.03%			0.766497	
Beginning Balance - source	1,121,440			383,484						
2017 January	1,077,029	0.341957	(15,187)	368,298	708,732	0.005858	2,076	2,076	0.766497	2,708
2017 February	990,077	0.341957	(29,734)	338,564	651,513	0.005858	3,984	6,060	0.766497	7,907
2017 March	910,655	0.341957	(27,159)	311,405	599,250	0.005858	3,664	9,724	0.766497	12,685
2017 April	834,625	0.341957	(25,999)	285,406	549,219	0.005858	3,364	13,088	0.766497	17,075
2017 May	764,163	0.341957	(24,095)	261,311	502,852	0.005858	3,082	16,170	0.766497	21,096
2017 June	674,701	0.341957	(30,592)	230,719	443,982	0.005858	2,773	18,943	0.766497	24,714
2017 July	564,043	0.341957	(37,840)	192,879	371,165	0.005858	2,388	21,331	0.766497	27,829
2017 August	455,010	0.341957	(37,285)	155,594	299,416	0.005858	1,964	23,295	0.766497	30,392
2017 September	360,314	0.341957	(32,382)	123,212	237,102	0.005858	1,572	24,867	0.766497	32,442
2017 October	286,380	0.341957	(25,282)	97,930	188,451	0.005858	1,247	26,113	0.766497	34,068
2017 November	214,333	0.341957	(24,637)	73,293	141,040	0.005858	965	27,078	0.766497	35,327
2017 December	28,721	0.341957	(63,471)	9,821	18,900	0.005858	468	27,547	0.766497	35,939
							27,547			35,939

Note 1: Revenues collected represent amounts actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Residential DSM Programs Vintage 2015

NC Residential DSM	Total System NC DSM Program Costs Incurred	NC Residential DSM Allocation %	NC Allocated DSM Residential Program Costs	NC Residential Revenue Collected (EEC2)	NC Residential DSM Program Collection %	DSM Program Costs Revenue Collected	(Over)/Under Collection
	Miller Exhibit 5, pg 2 Line 9		See calc. at right				
Beginning Balance - from RI	31,962,633	32.5218612%	10,394,843	12,589,085	79.8848533%	10,056,772	338,071
2017 January		32.5218612%	-	16,049	81.9530406%	13,193	(13,153)
2017 February		32.5218612%	-	31,423	81.9530406%	25,752	(25,752)
2017 March		32.5218612%	-	28,701	81.9530406%	23,522	(23,522)
2017 April		32.5218612%	-	27,476	81.9530406%	22,517	(22,517)
2017 May		32.5218612%	-	25,464	81.9530406%	20,869	(20,869)
2017 June		32.5218612%	-	32,330	81.9530406%	26,495	(26,495)
2017 July		32.5218612%	-	39,990	81.9530406%	32,773	(32,773)
2017 August		32.5218612%	-	39,403	81.9530406%	32,292	(32,292)
2017 September		32.5218612%	-	34,222	81.9530406%	28,046	(28,046)
2017 October		32.5218612%	-	26,718	81.9530406%	21,896	(21,896)
2017 November		32.5218612%	-	26,037	81.9530406%	21,338	(21,338)
2017 December		32.5218612%	-	67,077	81.9530406%	54,972	(54,972)
			10,394,843	12,983,975		10,380,396	14,447

Program Costs to be recovered in Rider 8
Revenue Requirement Requested in Rider 8

338,071
412,518

Percent of Revenue to be applied to total collections

82%

NC Residential DSM	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
	2017				7.03%				0.766497	
Beginning Balance - from RI	338,071			115,606	222,465					
2017 January	324,918	0.341957	(4,498)	111,108	213,810	0.005858	1,278	1,278	0.766497	1,667
2017 February	299,166	0.341957	(8,806)	102,302	196,864	0.005858	1,203	2,481	0.766497	3,237
2017 March	275,644	0.341957	(8,043)	94,258	181,386	0.005858	1,108	3,589	0.766497	4,682
2017 April	253,127	0.341957	(7,700)	86,558	166,568	0.005858	1,019	4,608	0.766497	6,012
2017 May	232,258	0.341957	(7,136)	79,422	152,836	0.005858	936	5,544	0.766497	7,232
2017 June	205,763	0.341957	(9,060)	70,362	135,401	0.005858	844	6,388	0.766497	8,334
2017 July	172,990	0.341957	(11,207)	59,155	113,835	0.005858	730	7,118	0.766497	9,286
2017 August	140,699	0.341957	(11,042)	48,113	92,586	0.005858	605	7,723	0.766497	10,075
2017 September	112,653	0.341957	(9,590)	38,522	74,130	0.005858	488	8,211	0.766497	10,712
2017 October	90,756	0.341957	(7,488)	31,035	59,722	0.005858	392	8,603	0.766497	11,224
2017 November	69,419	0.341957	(7,297)	23,738	45,680	0.005858	309	8,912	0.766497	11,627
2017 December	14,447	0.341957	(18,798)	4,940	9,507	0.005858	162	9,073	0.766497	11,838
							9,073			11,838

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Non- Residential EE Programs Vintage 2015

NC Non- Residential EE	Non-Residential EE Program Costs		NC Allocated EE Program Costs	NC Residential Revenue Collected(EEC15)	NC Non- Residential EE Program Collection %	Non-Residential EE Program Costs Revenue Collected	(Over)/Under Collection
	Incurred	NC Allocation %					
	Miller Exhibit 5, pg 2, Line 4				See calc. at right		
Beginning Balance - source Rider	40,096,318	72.9564706%	29,252,858	25,791,031	66.566216%	17,168,113	12,084,745
2017 January		72.9564706%	-	515,376	43.0115898%	(221,672)	(221,672)
2017 February		72.9564706%	-	1,870,494	43.0115898%	(804,529)	(804,529)
2017 March		72.9564706%	-	1,835,331	43.0115898%	(789,405)	(789,405)
2017 April		72.9564706%	-	2,064,787	43.0115898%	(888,098)	(888,098)
2017 May		72.9564706%	-	1,856,630	43.0115898%	(798,566)	(798,566)
2017 June		72.9564706%	-	2,209,714	43.0115898%	(950,433)	(950,433)
2017 July		72.9564706%	-	2,357,161	43.0115898%	(1,013,852)	(1,013,852)
2017 August		72.9564706%	-	2,372,747	43.0115898%	(1,020,556)	(1,020,556)
2017 September		72.9564706%	-	2,328,313	43.0115898%	(1,001,444)	(1,001,444)
2017 October		72.9564706%	-	2,013,545	43.0115898%	(866,058)	(866,058)
2017 November		72.9564706%	-	1,908,495	43.0115898%	(820,874)	(820,874)
2017 December		72.9564706%	-	2,772,360	43.0115898%	(1,192,436)	(1,192,436)
	-		29,252,858	49,895,986		27,536,038	1,716,821

Program Cost Allocation Calculation	
Non-Res EE Program Costs under collected balance	12,084,745
Non-Res EE Revenue Requirement in Rider 8	28,096,486
 % Revenue related to Program Costs	 43%
Note: Vintage Year 2015 collections in 2017 stem from Rider 8.	

NC Non-Residential EE	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
		2017				7.03%			0.766497	
Beginning Balance from Rider 9	12,084,745			4,132,463	7,952,282					
2017 January	11,863,074	0.341957	(75,802.13)	4,056,661	7,806,413	0.005858	46,160	46,160	0.766497	60,222
2017 February	11,058,544	0.341957	(275,114.44)	3,781,547	7,276,998	0.005858	44,182	90,342	0.766497	117,863
2017 March	10,269,139	0.341957	(269,942.58)	3,511,604	6,757,535	0.005858	41,109	131,451	0.766497	171,496
2017 April	9,381,042	0.341957	(303,691.26)	3,207,913	6,173,129	0.005858	37,876	169,327	0.766497	220,910
2017 May	8,582,475	0.341957	(273,075.28)	2,934,838	5,647,698	0.005858	34,625	203,952	0.766497	266,084
2017 June	7,632,042	0.341957	(325,007.24)	2,609,830	5,022,212	0.005858	31,254	235,206	0.766497	306,858
2017 July	6,618,190	0.341957	(346,693.95)	2,263,136	4,355,054	0.005858	27,468	262,674	0.766497	342,694
2017 August	5,597,633	0.341957	(348,986.40)	1,914,150	3,683,484	0.005858	23,546	286,220	0.766497	373,413
2017 September	4,596,189	0.341957	(342,450.88)	1,571,699	3,024,490	0.005858	19,649	305,869	0.766497	399,047
2017 October	3,730,131	0.341957	(296,154.57)	1,275,545	2,454,587	0.005858	16,049	321,918	0.766497	419,986
2017 November	2,909,257	0.341957	(280,703.66)	994,841	1,914,416	0.005858	12,798	334,715	0.766497	436,682
2017 December	1,716,821	0.341957	(407,761.94)	587,079	1,129,742	0.005858	8,917	343,632	0.766497	448,315
							343,632			448,315

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Non - Residential DSM Programs Vintage 2015

NC Non-Residential DSM	Total System NC DSM Program Costs Incurred	NC Non- Residential DSM Allocation %	NC Allocated DSM Non-Residential Program Costs	Incentives Earned & GRT remitted (Allocated based on WA of Program Costs Incurred)	Total DSM Revenue Requirement	NC Non-Residential DSM Revenue Collected(DSIS)	NC Non-Residential DSM Program Collection %	Non-Residential DSM Program Costs Revenue Collected	(Over)/Under Collection
		See Miller Exhibit 5 pg. 2, Line 10		, calculated interest on entire balance due to over- collection in total			100% used due to over-collection of entire vintage		
Beginning Balance - revenue req	51,958,782	42.4483655%	19,565,981	3,399,898	16,965,879	20,170,831	100.000000%	20,170,831	(3,204,959)
2017 January	-	42.4483655%	-	-	-	(47,737)	100.000000%	(47,737)	47,737
2017 February	-	42.4483655%	-	-	-	(185,758)	100.000000%	(185,758)	185,758
2017 March	-	42.4483655%	-	-	-	(182,828)	100.000000%	(182,828)	182,828
2017 April	-	42.4483655%	-	-	-	(205,754)	100.000000%	(205,754)	205,754
2017 May	-	42.4483655%	-	-	-	(184,460)	100.000000%	(184,460)	184,460
2017 June	-	42.4483655%	-	-	-	(219,617)	100.000000%	(219,617)	219,617
2017 July	-	42.4483655%	-	-	-	(235,112)	100.000000%	(235,112)	235,112
2017 August	-	42.4483655%	-	-	-	(239,081)	100.000000%	(239,081)	239,081
2017 September	-	42.4483655%	-	-	-	(229,504)	100.000000%	(229,504)	229,504
2017 October	-	42.4483655%	-	-	-	(204,689)	100.000000%	(204,689)	204,689
2017 November	-	42.4483655%	-	-	-	(191,309)	100.000000%	(191,309)	191,309
2017 December	-	42.4483655%	-	-	-	(272,919)	100.000000%	(272,919)	272,919
	-	-	-	-	16,965,879	17,772,063	-	-	(806,185)

Program Cost Allocation Methodology
No program cost allocation is needed because the vintage was overcollected in total and interest due was calculated on the entire vintage.

Therefore, 100% of all revenues offset the overcollected balance.

NC Non-Residential DSM	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
		2017 tax rate				7.03%			0.766497	
Beginning Balance - from Rider 1	(3,204,959)			(1,095,956)	(2,108,997)					
2017 January	(9,157,216)	0.341957	16,324	(1,079,632)	(2,077,584)	0.005858	(12,263)	(12,263)	0.766497	(15,999)
2017 February	(2,971,458)	0.341957	63,521	(1,016,113)	(1,955,347)	0.005858	(11,813)	(24,076)	0.766497	(31,411)
2017 March	(2,788,631)	0.341957	62,519	(953,592)	(1,835,039)	0.005858	(11,103)	(35,179)	0.766497	(45,896)
2017 April	(2,582,876)	0.341957	70,359	(883,233)	(1,699,644)	0.005858	(10,354)	(45,539)	0.766497	(59,404)
2017 May	(2,398,416)	0.341957	63,077	(820,155)	(1,578,261)	0.005858	(9,602)	(55,134)	0.766497	(71,930)
2017 June	(2,178,799)	0.341957	75,100	(745,055)	(1,433,743)	0.005858	(8,823)	(63,957)	0.766497	(83,440)
2017 July	(1,943,687)	0.341957	80,898	(664,657)	(1,279,029)	0.005858	(7,945)	(71,908)	0.766497	(93,807)
2017 August	(1,704,605)	0.341957	81,756	(582,902)	(1,121,705)	0.005858	(7,032)	(78,935)	0.766497	(102,982)
2017 September	(1,475,102)	0.341957	78,480	(504,421)	(970,680)	0.005858	(6,128)	(85,064)	0.766497	(110,978)
2017 October	(1,270,413)	0.341957	69,995	(434,426)	(835,986)	0.005858	(5,292)	(90,356)	0.766497	(117,882)
2017 November	(1,079,104)	0.341957	65,419	(369,007)	(710,097)	0.005858	(4,529)	(94,885)	0.766497	(123,790)
2017 December	(806,185)	0.341957	93,327	(275,680)	(530,504)	0.005858	(3,634)	(98,519)	0.766497	(128,531)
							(98,519)			(128,531)

Note 1: Revenues collected represent cash received as of December 31, 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Residential EE Programs Vintage 2016

Miller Exhibit

NC Residential EE	Residential EE Program Costs Incurred	NC Allocation %	NC Allocated EE Program Costs	NC Residential Revenue Collected	NC Residential EE Program Collection %	EE Program Costs Revenue Collected	(Over)/Under Collection
	Miller Exhibit 5 pg. 3, Line 4			see calc. at right			
Beginning Balance - source	54,751,215	73.0962827%	40,021,103	44,821,836	63.0138%	28,243,964	11,777,138
2017 January		73.0962827%	-	-	0.0000%	-	-
2017 February		73.0962827%	-	-	0.0000%	-	-
2017 March		73.0962827%	-	-	0.0000%	-	-
2017 April		73.0962827%	-	-	0.0000%	-	-
2017 May		73.0962827%	-	-	0.0000%	-	-
2017 June		73.0962827%	-	-	0.0000%	-	-
2017 July		73.0962827%	-	-	0.0000%	-	-
2017 August		73.0962827%	-	-	0.0000%	-	-
2017 September		73.0962827%	-	-	0.0000%	-	-
2017 October		73.0962827%	-	-	0.0000%	-	-
2017 November		73.0962827%	-	-	0.0000%	-	-
2017 December		73.0962827%	-	-	0.0000%	-	-
			40,021,103	44,821,836		28,243,964	11,777,138

Note: All revenues collected in Rider 8 were to collect Y2 of lost revenue. Therefore, no revenue received in 2017 would offset the under collected balance of program costs and a return would still be earned.

Although from a 2019 recovery standpoint, we anticipate being over-collected in total, those revenues have not yet been received and therefore interest due could not be accurately calculated.

NC Residential EE	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
		2017 tax rate				7.03%			0.766497	
Beginning Balance - source	11,777,138			4,027,275	7,749,863					
2017 January	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	45,401	0.766497	59,232
2017 February	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	90,803	0.766497	118,464
2017 March	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	136,204	0.766497	177,697
2017 April	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	181,605	0.766497	236,929
2017 May	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	227,006	0.766497	296,161
2017 June	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	272,408	0.766497	355,393
2017 July	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	317,809	0.766497	414,625
2017 August	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	363,210	0.766497	473,857
2017 September	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	408,612	0.766497	533,090
2017 October	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	454,013	0.766497	592,322
2017 November	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	499,414	0.766497	651,554
2017 December	11,777,138	0.341957	-	4,027,275	7,749,863	0.005858	45,401	544,815	0.766497	710,786
							544,815			710,786

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Residential DSM Programs Vintage 2016

NC Residential DSM	Total System NC DSM Program Costs Incurred	NC Residential DSM Allocation %	NC Allocated DSM Residential Program Costs	NC Residential Revenue Collected	NC Residential DSM Program Collection %	DSM Program Costs Revenue Collected	(Over)/Under Collection
	Miller Exhibit 5, pg 3 Line 9			See calc. at right			
Beginning Balance - Source	28,406,298	33.7973480%	9,600,575	13,363,032	77.572582%	10,366,049	(765,474)
2017 January		33.7973480%	-		0.0000000%	-	-
2017 February		33.7973480%	-		0.0000000%	-	-
2017 March		33.7973480%	-		0.0000000%	-	-
2017 April		33.7973480%	-		0.0000000%	-	-
2017 May		33.7973480%	-		0.0000000%	-	-
2017 June		33.7973480%	-		0.0000000%	-	-
2017 July		33.7973480%	-		0.0000000%	-	-
2017 August		33.7973480%	-		0.0000000%	-	-
2017 September		33.7973480%	-		0.0000000%	-	-
2017 October		33.7973480%	-		0.0000000%	-	-
2017 November		33.7973480%	-		0.0000000%	-	-
2017 December		33.7973480%	-		0.0000000%	-	-
	28,406,298		9,600,575	13,363,032		10,366,049	(765,474)

Note: All revenues collected in Rider 8 were to collect Y2 of lost revenue. Therefore, no revenue received in 2017 would offset the over collected balance of program costs and interest would still be earned.

Although from a 2019 recovery standpoint, we anticipate being over-collected in total, those revenues have not yet been received and therefore interest due could not be accurately calculated.

NC Residential DSM	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
	2017					7.03%			0.766497	
Beginning Balance - source	(765,474)			(261,759)	(503,715)					
2017 January	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(2,951)	0.766497	(3,850)
2017 February	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(5,902)	0.766497	(7,700)
2017 March	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(8,853)	0.766497	(11,550)
2017 April	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(11,804)	0.766497	(15,400)
2017 May	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(14,755)	0.766497	(19,249)
2017 June	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(17,706)	0.766497	(23,099)
2017 July	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(20,656)	0.766497	(26,949)
2017 August	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(23,607)	0.766497	(30,799)
2017 September	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(26,558)	0.766497	(34,649)
2017 October	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(29,509)	0.766497	(38,499)
2017 November	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(32,460)	0.766497	(42,349)
2017 December	(765,474)	0.341957	-	(261,759)	(503,715)	0.005858	(2,951)	(35,411)	0.766497	(46,199)
							(35,411)			(46,199)

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Non-Residential EE Programs Vintage 2016

NC Non-Residential EE	Non-Residential EE Program Costs Incurred	NC Allocation % Miller Exhibit 5, pg 3, Line 4	NC Allocated EE Program Costs	Total Revenue Collected	Percent Attributable to Program Costs	NC Residential Revenue Collected	(Over)/Under Collection
Beginning Balance - Source Rider	68,416,594		50,009,987	45,662,897	69.71121%	31,832,160	18,177,827
2017 January		73.0962827%	-				-
2017 February		73.0962827%	-				-
2017 March		73.0962827%	-				-
2017 April		73.0962827%	-				-
2017 May		73.0962827%	-				-
2017 June		73.0962827%	-				-
2017 July		73.0962827%	-				-
2017 August		73.0962827%	-				-
2017 September		73.0962827%	-				-
2017 October		73.0962827%	-				-
2017 November		73.0962827%	-				-
2017 December		73.0962827%	-				-
			50,009,987	45,662,897		31,832,160	18,177,827

Note: All revenues collected in Rider 8 were to collect Y2 of lost revenue. Therefore, no revenue received in 2017 would offset the under collected balance of program costs and a return would still be earned.

Although from a 2019 recovery standpoint, we anticipate being over-collected in total, those revenues have not yet been received and therefore interest due could not be accurately calculated.

NC Non-Residential EE	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
		2017				7.03%			0.766497	
Beginning Balance - Source Rider	18,177,827			6,216,035						
2017 January	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	35,038	35,038	0.766497	45,712
2017 February	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	105,114	0.766497	137,136
2017 March	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	175,190	0.766497	228,560
2017 April	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	245,267	0.766497	319,984
2017 May	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	315,343	0.766497	411,408
2017 June	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	385,419	0.766497	502,832
2017 July	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	455,495	0.766497	594,256
2017 August	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	525,571	0.766497	685,679
2017 September	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	595,647	0.766497	777,103
2017 October	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	665,724	0.766497	868,527
2017 November	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	735,800	0.766497	959,951
2017 December	18,177,827	0.341957	-	6,216,035	11,961,792	0.005858	70,076	805,876	0.766497	1,051,375
							805,876			1,051,375

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Residential EE Programs Vintage 2017

		Residential EE Program Costs Incurred	NC Allocation %	NC Allocated EE Program Costs	NC Residential Revenue Collected	NC Residential EE Program Collection %	EE Program Costs Revenue Collected	(Over)/Under Collection
NC Residential EE		Miller Exhibit 5 pg. 4, Line 4			see calc. at right			
2017	January	3,951,450	72.8087506%	2,877,001	1,996,861	59.7964%	(1,194,051)	1,682,950
2017	February	3,156,018	72.8087506%	2,297,857	3,909,707	59.7964%	(2,337,865)	(40,008)
2017	March	5,539,541	72.8087506%	4,033,271	3,571,065	59.7964%	(2,135,370)	1,897,901
2017	April	5,860,111	72.8087506%	4,266,674	3,418,589	59.7964%	(2,044,194)	2,222,479
2017	May	5,434,589	72.8087506%	3,956,856	3,168,260	59.7964%	(1,894,506)	2,062,350
2017	June	3,881,110	72.8087506%	2,825,788	4,022,519	59.7964%	(2,405,323)	420,465
2017	July	6,137,644	72.8087506%	4,468,742	4,975,556	59.7964%	(2,975,205)	1,493,537
2017	August	6,299,458	72.8087506%	4,586,557	4,902,516	59.7964%	(2,931,529)	1,655,027
2017	September	6,442,152	72.8087506%	4,690,450	4,257,908	59.7964%	(2,546,077)	2,144,374
2017	October	4,072,457	72.8087506%	2,965,105	3,324,307	59.7964%	(1,987,817)	977,288
2017	November	6,023,635	72.8087506%	4,385,733	3,239,508	59.7964%	(1,937,110)	2,448,623
2017	December	8,424,569	72.8087506%	6,133,823	8,345,791	59.7964%	(4,990,485)	1,143,338
		65,222,734		47,487,858	49,132,586			18,108,325

EE Program Costs	47,487,859
EE Revenue Requirement	79,415,877
% Revenue related to Program Costs	59.7964%

		Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
NC Residential EE		2017 tax rate					7.03%			0.766497	
2017	January	1,682,950	0.341957	575,497	575,497	1,107,453	0.005858	3,244	3,244	0.766497	4,232
2017	February	1,642,942	0.341957	(13,681)	561,816	1,081,127	0.005858	6,411	9,655	0.766497	12,596
2017	March	3,540,843	0.341957	649,001	1,210,816	2,330,027	0.005858	9,992	19,646	0.766497	25,632
2017	April	5,763,322	0.341957	759,992	1,970,808	3,792,514	0.005858	17,934	37,580	0.766497	49,029
2017	May	7,825,673	0.341957	705,235	2,676,044	5,149,629	0.005858	26,193	63,773	0.766497	83,201
2017	June	8,246,138	0.341957	143,781	2,819,824	5,426,313	0.005858	30,979	94,752	0.766497	123,617
2017	July	9,739,675	0.341957	510,725	3,330,550	6,409,125	0.005858	34,668	129,420	0.766497	168,846
2017	August	11,394,702	0.341957	565,948	3,896,498	7,498,204	0.005858	40,737	170,157	0.766497	221,993
2017	September	13,539,076	0.341957	733,284	4,629,782	8,909,294	0.005858	48,060	218,217	0.766497	284,694
2017	October	14,516,364	0.341957	334,191	4,963,972	9,552,392	0.005858	54,077	272,295	0.766497	355,246
2017	November	16,964,987	0.341957	837,324	5,801,296	11,163,691	0.005858	60,681	332,975	0.766497	434,412
2017	December	18,108,325	0.341957	390,973	6,192,269	11,916,057	0.005858	67,604	400,580	0.766497	522,611
								400,580			522,611

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Residential DSM Programs Vintage 2017

NC Residential DSM	Total System NC		NC Residential DSM Allocation %	NC Allocated		NC Residential DSM Program Revenue Collected	NC Residential DSM Program Collection %	DSM Program Costs Revenue Collected	(Over)/Under Collection
	DSM Program Costs Incurred	NC Residential DSM Program Costs Incurred		DSM Residential Program Costs	NC Residential DSM Program Costs				
Miller Exhibit 5, pg 4 Line 9									
See calc. at right									
2017	1,633,196	33,807,510.4%		552,143	519,488	77.3907656%		(402,036)	150,107
2017	1,772,850	33,807,510.4%		599,356	1,017,119	77.3907656%		(787,156)	(187,800)
2017	1,805,428	33,807,510.4%		610,370	929,021	77.3907656%		(718,976)	(108,606)
2017	2,139,454	33,807,510.4%		723,296	889,354	77.3907656%		(688,278)	35,018
2017	2,105,003	33,807,510.4%		711,649	824,230	77.3907656%		(637,878)	73,771
2017	2,212,929	33,807,510.4%		746,136	1,046,468	77.3907656%		(809,869)	(61,733)
2017	3,457,756	33,807,510.4%		1,168,981	1,294,402	77.3907656%		(1,001,748)	167,233
2017	3,721,393	33,807,510.4%		1,258,110	1,275,401	77.3907656%		(987,042)	271,068
2017	3,547,993	33,807,510.4%		1,199,488	1,107,704	77.3907656%		(857,261)	342,227
2017	3,114,895	33,807,510.4%		1,053,068	-	77.3907656%		(669,295)	383,773
2017	1,792,385	33,807,510.4%		605,961	842,765	77.3907656%		(652,223)	(46,262)
2017	2,519,371	33,807,510.4%		851,737	2,171,177	77.3907656%		(1,680,290)	(828,554)
2017	29,822,653			10,082,397	12,781,955			(9,892,052)	190,244
								DSM Program Costs	10,082,396
								DSM Revenue Requirement	33,027,777
								% Revenue related to Program Costs	77%

DSM Program Costs	10,082,396
DSM Revenue Requirement	13,027,777
% Revenue related to Program Costs	77%

NC Residential DSM	Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
2017						7.03%			0.766497	
2017	150,107	0.341957	51,330	51,330	98,777	0.005858	289	289	0.766497	377
2017	(37,693)	0.341957	(64,219)	(12,889)	(24,803)	0.005858	217	506	0.766497	660
2017	(466,299)	0.341957	(37,139)	(50,028)	(96,271)	0.005858	(355)	151	0.766497	197
2017	(111,280)	0.341957	11,975	(38,053)	(73,227)	0.005858	(496)	(345)	0.766497	(450)
2017	(37,509)	0.341957	25,227	(12,826)	(24,683)	0.005858	(287)	(632)	0.766497	(824)
2017	(99,242)	0.341957	(21,110)	(33,937)	(65,306)	0.005858	(264)	(896)	0.766497	(1,168)
2017	67,991	0.341957	57,187	23,250	44,741	0.005858	(60)	(956)	0.766497	(1,247)
2017	339,059	0.341957	92,694	115,944	223,116	0.005858	785	(171)	0.766497	(123)
2017	681,287	0.341957	117,027	232,971	448,316	0.005858	1,967	1,796	0.766497	2,343
2017	1,065,059	0.341957	134,234	364,205	700,855	0.005858	3,366	5,162	0.766497	6,734
2017	1,018,798	0.341957	(15,820)	348,385	670,413	0.005858	4,017	9,178	0.766497	11,974
2017	190,244	0.341957	(283,330)	65,055	125,189	0.005858	2,330	11,509	0.766497	15,015
2017							11,509			15,015

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Non- Residential EE Programs Vintage 2017

NC Non- Residential EE		Non-Residential EE Program Costs		NC Allocated EE Program Costs	NC Residential Revenue Collected	NC Non- Residential EE Program Collection %	Non-Residential EE Program Costs Revenue Collected	(Over)/Under Collection
		Incurred	NC Allocation %			Collection %	Collected	
		Miller Exhibit 5, pg 4, Line 4				See calc. at right		
2017	January	7,765,034	72.8087506%	5,653,624	1,788,547	65.9170988%	(1,178,958)	4,474,666
2017	February	8,808,014	72.8087506%	6,413,005	3,571,027	65.9170988%	(2,353,917)	4,059,088
2017	March	9,879,807	72.8087506%	7,193,364	3,539,962	65.9170988%	(2,333,440)	4,859,924
2017	April	23,608,754	72.8087506%	17,189,239	3,940,432	65.9170988%	(2,597,419)	14,591,820
2017	May	7,844,571	72.8087506%	5,711,534	3,588,359	65.9170988%	(2,365,342)	3,346,192
2017	June	7,360,362	72.8087506%	5,358,988	4,246,626	65.9170988%	(2,799,253)	2,559,735
2017	July	5,200,887	72.8087506%	3,786,701	4,554,076	65.9170988%	(3,001,915)	784,786
2017	August	4,726,565	72.8087506%	3,441,353	4,558,676	65.9170988%	(3,004,947)	436,406
2017	September	3,115,532	72.8087506%	2,268,380	4,446,215	65.9170988%	(2,930,816)	(662,436)
2017	October	4,927,656	72.8087506%	3,587,765	3,864,800	65.9170988%	(2,547,564)	1,040,201
2017	November	4,602,929	72.8087506%	3,351,335	3,655,747	65.9170988%	(2,409,763)	941,573
2017	December	9,603,416	72.8087506%	6,992,127	5,173,662	65.9170988%	(3,410,328)	3,581,799
		97,443,527		70,947,415	46,928,129		(30,933,661)	40,013,754

Non-Res EE Program Costs	70,947,415
Non-Res EE Revenue Requirement	107,631,276
% Revenue related to Program Costs	66%

NC Non-Residential EE		Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
		2017					7.03%			0.766497	
2017	January	4,474,666	0.341957	1,530,143.33	1,530,143	2,944,523	0.005858	8,625	8,625	0.766497	11,252
2017	February	8,533,754	0.341957	1,388,033.51	2,918,177	5,615,577	0.005858	25,074	33,699	0.766497	43,965
2017	March	13,393,678	0.341957	1,661,885.03	4,580,062	8,813,616	0.005858	42,266	75,964	0.766497	99,106
2017	April	27,985,498	0.341957	4,989,775.08	9,569,837	18,415,661	0.005858	79,759	155,724	0.766497	203,163
2017	May	31,331,690	0.341957	1,144,253.67	10,714,091	20,617,599	0.005858	114,335	270,058	0.766497	352,328
2017	June	33,891,425	0.341957	875,319.29	11,589,410	22,302,015	0.005858	125,719	395,777	0.766497	516,345
2017	July	34,676,211	0.341957	268,363.16	11,857,773	22,818,438	0.005858	132,165	527,943	0.766497	688,773
2017	August	35,112,617	0.341957	149,232.04	12,007,005	23,105,612	0.005858	134,519	662,462	0.766497	864,272
2017	September	34,450,181	0.341957	(226,524.55)	11,780,481	22,669,700	0.005858	134,084	796,545	0.766497	1,039,202
2017	October	35,490,382	0.341957	355,703.86	12,136,184	23,354,197	0.005858	134,812	931,357	0.766497	1,215,082
2017	November	36,431,954	0.341957	321,977.31	12,458,162	23,973,792	0.005858	138,632	1,069,988	0.766497	1,395,946
2017	December	40,013,754	0.341957	1,224,821.40	13,682,983	26,330,770	0.005858	147,350	1,217,339	0.766497	1,588,185
								1,217,339			1,588,185

Note 1: Amounts represent all revenue actually collected through 2017.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Return Calculation - Non - Residential DSM Programs Vintage 2017

NC Non- Residential DSM		Total System NC DSM Program Costs Incurred	NC Non- Residential DSM Allocation %	NC Allocated DSM Non- Residential Program Costs	NC Non-Residential DSM Revenue Collected	NC Non- Residential DSM Program Collection %	Non-Residential DSM Program Costs Revenue Collected	(Over)/Under Collection
		See Miller Exhibit 5 pg. 4, Line 10						
2017	January	1,633,156	40.0747013%	654,498	548,546	77.3901377%	(424,830)	229,659
2017	February	1,772,850	40.0747013%	710,464	1,153,427	77.3901377%	(892,639)	(182,174)
2017	March	1,805,428	40.0747013%	723,520	1,136,471	77.3901377%	(879,516)	(155,997)
2017	April	2,139,454	40.0747013%	857,380	1,266,921	77.3901377%	(980,472)	(123,092)
2017	May	2,105,003	40.0747013%	843,574	1,156,729	77.3901377%	(895,195)	(51,621)
2017	June	2,212,929	40.0747013%	886,825	1,365,063	77.3901377%	(1,056,424)	(169,599)
2017	July	3,457,756	40.0747013%	1,385,685	1,459,627	77.3901377%	(1,129,608)	256,078
2017	August	3,721,393	40.0747013%	1,491,337	1,471,285	77.3901377%	(1,138,629)	352,708
2017	September	3,547,993	40.0747013%	1,421,848	1,424,894	77.3901377%	(1,102,727)	319,120
2017	October	3,114,895	40.0747013%	1,248,285	1,270,748	77.3901377%	(883,433)	264,852
2017	November	1,792,385	40.0747013%	718,293	1,186,725	77.3901377%	(918,408)	(200,115)
2017	December	2,519,371	40.0747013%	1,009,630	1,920,586	77.3901377%	(1,486,352)	(476,721)
		29,822,653		11,951,339	15,361,431		(11,888,233)	63,106

DSM Program Costs	11,951,339
DSM Revenue Requirement	15,442,974
% Revenue related to Program Costs	77%

NC Non-Residential DSM		Cumulative (Over)/Under Recovery	Current Income Tax Rate	Monthly Deferred Income Tax	Cumulative Deferred Income Tax	Net Deferred After Tax Balance	Monthly Return on Deferral	Monthly A/T Return on Deferral	YTD After Tax Interest	Gross up of Return to Pretax Rate	Gross up of Return to Pretax
		2017 tax rate				7.03%				0.766497	
2017	January	229,669	0.341957	78,537	78,537	151,132	0.005858	443	443	0.766497	578
2017	February	47,494	0.341957	(62,296)	16,241	31,253	0.005858	534	977	0.766497	1,275
2017	March	(108,502)	0.341957	(53,344)	(17,103)	(71,399)	0.005858	(118)	859	0.766497	1,121
2017	April	(231,595)	0.341957	(42,092)	(79,195)	(152,399)	0.005858	(656)	204	0.766497	266
2017	May	(283,216)	0.341957	(17,652)	(96,848)	(186,368)	0.005858	(992)	(789)	0.766497	(1,029)
2017	June	(452,815)	0.341957	(57,996)	(154,843)	(297,972)	0.005858	(1,419)	(2,207)	0.766497	(2,880)
2017	July	(196,737)	0.341957	87,568	(67,276)	(129,461)	0.005858	(1,252)	(3,459)	0.766497	(4,513)
2017	August	155,971	0.341957	120,611	53,335	102,636	0.005858	(79)	(3,538)	0.766497	(4,616)
2017	September	475,091	0.341957	109,125	162,461	312,630	0.005858	1,216	(2,321)	0.766497	(3,029)
2017	October	739,943	0.341957	90,568	253,029	486,914	0.005858	2,342	21	0.766497	27
2017	November	539,827	0.341957	(68,431)	184,598	355,230	0.005858	2,467	2,487	0.766497	3,245
2017	December	63,106	0.341957	(163,018)	21,580	41,527	0.005858	1,162	3,649	0.766497	4,761
								3,649			4,761

Note 1: Amounts represent all revenue actually collected through 2017.

I/A

Duke Energy Carolinas, LLC
DSM/EE Actual Revenues Collected from Years 2014-2017 (By Vintage)
and Estimated 2018 Collections from revised forecast of Rider 9 (by Vintage)
Docket Number E-7, Sub 1164
For Vintage Year 2014-2018 Estimate and True Up Calculations

			Actual 2014 Rider 5	Actual 2015 Rider 6	Actual 2016 Rider 7	Actual 2017 Rider 8	Estimated 2018 Rider 9 ⁽¹⁾	Total
Residential								
Line		Vintage						
1	EE/DSM	Year 2014	58,390,274	3,829,621	10,429,161	11,056,910	357,695	84,063,661
2		Year 2015		58,227,163	4,026,042	10,183,996	7,882,715	80,319,916
3		Year 2016			58,184,868	5,570,022	25,714,799	89,469,689
4		Year 2017				61,914,541	4,202,002	66,116,542
5		Year 2018					79,304,216	79,304,216
6	Total Residential		\$ 58,390,274	\$ 62,056,784	\$ 72,640,070	\$ 88,725,470	\$ 117,461,426	\$ 319,969,808
Non-Residential								
7	EE	Year 2014	22,574,937	5,169,897	8,822,463	3,744,578	104,651	40,416,525
8		Year 2015	-	25,791,031	8,194,784	24,104,955	8,012,414	66,103,184
9		Year 2016			45,662,897	8,632,771	38,450,266	92,745,934
10		Year 2017				46,928,129	9,130,462	56,058,591
11		Year 2018					55,443,530	55,443,530
12	DSM	Year 2014	18,087,702	210,549	(929,247)	(317,221)	(122,245)	16,929,538
13		Year 2015		19,579,477	280,553	(2,398,768)	(483,451)	16,977,811
14		Year 2016			14,637,127	251,004	297,692	15,185,823
15		Year 2017				15,361,431	-	15,361,431
16		Year 2018					14,549,912	14,549,912
17	Total Non-Residential		\$ 40,662,639	\$ 50,750,953	\$ 76,668,577	\$ 96,306,880	\$ 125,383,230	\$ 359,860,936
18	Total Revenue		\$ 99,052,912	\$ 112,807,737	\$ 149,308,648	\$ 185,032,349	\$ 242,844,656	\$ 679,830,743

⁽¹⁾ Rider 9 estimates are based on Miller Exhibit 7, page 1 and page 2

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Duke Energy Carolinas, LLC
 Vintage Year 2014 Allocation for the Period January 1, 2014
 Docket Number E-7, Sub 1164
 Allocation Factors

			MWH		
Line	New Mechanism Sales Allocator at Generator				
1	NC Retail MWH Sales Allocation	Company Records	58,149,791		
2	SC Retail MWH Sales Allocation	Company Records	21,551,077		
3	Total Retail	Line 1 + Line 2	79,700,868		
Allocation 1 to state based on kWh sales					
4	NC Retail	Line 1 / Line 3	72.9600473%		
Demand Allocators			NC	SC	Total
5	Residential	Company Records	5,051,778	1,502,084	6,553,862
6	Non Residential	Company Records	6,119,392	2,175,746	8,295,138
7	Total	Line 5 + Line 6	11,171,170	3,677,830	14,849,000
Allocation 2 to state based on peak demand					
8	NC Retail	Line 7, NC / Line 7 Total	75.2318001%		
Allocation 3 NC res vs non-res Peak Demand to retail system peak					
9	NC Residential	Line 5 NC/ Line 7 Total	34.0209980%		
10	NC Non-residential	Line 6 NC/ Line 7 Total	41.2108021%		

Duke Energy Carolinas, LLC
 Vintage Year 2015 Allocation Factors for the Period January 1, 2015 to December 31, 2015
 Docket Number E-7, Sub 1164
 Allocation Factors

			MWH		
Line New Mechanism Sales Allocator at Generator					
1	NC Retail MWH Sales Allocation	Company Records	59,567,575		
2	SC Retail MWH Sales Allocation	Company Records	22,080,529		
3	Total Retail	Line 1 + Line 2	81,648,104		
Allocation 1 to state based on kWh sales					
4	NC Retail	Line 1 / Line 3	72.9564706%		
Demand Allocators					
			NC	SC	Total
5	Residential	Company Records	4,994,057	1,469,714	6,463,771
6	Non Residential	Company Records	6,518,371	2,373,858	8,892,229
7	Total	Line 5 + Line 6	11,512,428	3,843,572	15,356,000
Allocation 2 to state based on peak demand					
8	NC Retail	Line 7, NC / Line 7 Total	74.9702266%		
Allocation 3 NC res vs non-res Peak Demand to retail system peak					
9	NC Residential	Line 5 NC/ Line 7 Total	32.5218612%		
10	NC Non-residential	Line 6 NC/ Line 7 Total	42.4483655%		

Duke Energy Carolinas, LLC
 Vintage Year 2016 Allocation Factors for the Period January 1, 2016
 Docket Number E-7, Sub 1164
 Allocation Factors

			MWH		
Line	New Mechanism Sales Allocator at Generator				
1	NC Retail MWH Sales Allocation	Company Records	60,762,752		
2	SC Retail MWH Sales Allocation	Company Records	22,364,255		
3	Total Retail	Line 1 + Line 2	83,127,007		
Allocation 1 to state based on kWh sales					
4	NC Retail	Line 1 / Line 3	73.0962827%		
Demand Allocators					
			NC	SC	Total
5	Residential	Company Records	5,403,520	1,714,752	7,118,272
6	Non Residential	Company Records	6,525,765	2,343,963	8,869,728
7	Total	Line 5 + Line 6	11,929,285	4,058,715	15,988,000
Allocation 2 to state based on peak demand					
8	NC Retail	Line 7, NC / Line 7 Total	74.6139917%		
Allocation 3 NC res vs non-res Peak Demand to retail system peak					
9	NC Residential	Line 5 NC/ Line 7 Total	33.7973480%		
10	NC Non-residential	Line 6 NC/ Line 7 Total	40.8166437%		

Duke Energy Carolinas, LLC
 Vintage Year 201 Allocation Factors for the Period January 1, 2017 - December 31, 2019
 Docket Number E-7, Sub 1164
 Allocation Factors

			MWH		
Line	New Mechanism Sales Allocator at Generator				
1	NC Retail MWH Sales Allocation	Company Records	60,219,051		
2	SC Retail MWH Sales Allocation	Company Records	22,489,484		
3	Total Retail	Line 1 + Line 2	82,708,535		
Allocation 1 to state based on kWh sales					
4	NC Retail	Line 1 / Line 3	72.8087506%		
Demand Allocators			NC	SC	Total
5	Residential	Company Records	5,545,784	1,803,958	7,349,742
6	Non Residential	Company Records	6,573,854	2,480,404	9,054,258
7	Total	Line 5 + Line 6	12,119,638	4,284,362	16,404,000
Allocation 2 to state based on peak demand					
8	NC Retail	Line 7, NC / Line 7 Total	73.8822117%		
Allocation 3 NC res vs non-res Peak Demand to retail system peak					
9	NC Residential	Line 5 NC/ Line 7 Total	33.8075104%		
10	NC Non-residential	Line 6 NC/ Line 7 Total	40.0747013%		

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Duke Energy Carolinas, LLC
 DSM/EE Cost Recovery Rider 10
 Docket Number E-7 Sub 1164
 Forecasted 2019 kWh Sales for Rate Period for Vintage Years 2014-2019

Fall 2017 Sales Forecast - kWhs

Forecasted 2019 sales

North Carolina Retail:

Line		
1	Residential	21,806,637,265
2	Non-Residential	34,250,780,653
3	Total Retail	56,057,417,918

NC Opt Out Sales

	Total Usage	Opt-Outs	Net Usage
Vintage 2014 Actual Opt Out			
4 EE	34,250,780,653	15,991,066,628	18,259,714,025
5 DSM	34,250,780,653	16,187,898,289	18,062,882,364
Vintage 2015 Actual Opt Out			
6 EE	34,250,780,653	16,116,270,178	18,134,510,475
7 DSM	34,250,780,653	16,399,422,941	17,851,357,712
Vintage 2016 Actual Opt Out			
8 EE	34,250,780,653	16,400,808,135	17,849,972,518
9 DSM	34,250,780,653	16,691,541,710	17,559,238,943
Vintage 2017 Actual Opt Out			
10 EE	34,250,780,653	16,719,165,367	17,531,615,286
11 DSM	34,250,780,653	16,725,619,235	17,525,161,418
Vintage 2018 Estimated Opt Out			
12 EE	34,250,780,653	17,253,362,339	16,997,418,314
13 DSM	34,250,780,653	16,828,588,916	17,422,191,737
Vintage 2019 Estimated Opt Out			
14 EE	34,250,780,653	17,253,362,339	16,997,418,314
15 DSM	34,250,780,653	16,828,588,916	17,422,191,737

Miller Exhibit 7, page 1

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Duke Energy Carolinas, LLC
DSM/EE Cost Recovery Rider 10
Docket Number E-7 Sub 1164
Revised Exhibit Summary for Rider 9 EE Exhibits and Estimated Revenue

Residential Billing Factors

Residential Billing Factor for Rider 9 True-up (EMF) Components

		Adjusted	As filed	Difference
Line				
1	Year 2014 EE/DSM True-Up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 1 Line 15	357,695	357,695
2	Year 2015 EE/DSM True-Up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 2 Line 15	4,451,079	4,451,079
3	Year 2016 EE/DSM True-Up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 3 Line 15	17,949,476	17,949,476
4	Total True-up (EMF) Revenue Requirement	Sum Lines 1-3	\$ 22,758,250	\$ 22,758,250
5	Projected NC Residential Sales (kWh) for rate period	Miller Exhibit 7 pg. 3, Line 1	21,243,226,519	21,243,226,519
6	EE/DSM Revenue Requirement EMF Residential Rider EE (cents per kWh)	Line 4 / Line 5 * 100	0.1071	0.1071

Residential Billing Factor for Rider 9 Prospective Components

7	Vintage 2015 Total EE/DSM Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 2, Line 15	3,431,636	3,431,636
8	Vintage 2016 Total EE/DSM Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 3, Line 1	7,765,323	7,765,323
9	Vintage 2017 Total EE/DSM Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 4, Line 1	4,202,002	4,202,002
10	Vintage 2018 Total EE/DSM Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 5, Line 11	79,304,216	79,304,216
11	Total Prospective Revenue Requirement	Sum Lines 7-10	\$ 94,703,176	\$ 94,703,176
12	Projected NC Residential Sales (kWh) for rate period	Miller Exhibit 7 pg. 3, Line 1	21,243,226,519	21,243,226,519
13	EE/DSM Revenue Requirement Prospective Residential Rider EE (cents per kWh)	Line 11 / Line 12 * 100	0.4458	0.4458
<u>Total Revenue Requirements in Rider 9 from Residential Customers</u>				
14	Total True-up (EMF) Revenue Requirement	Line 4	\$ 22,758,250	22,758,250
15	Total Prospective Revenue Requirement	Line 11	94,703,176	94,703,176
16	Total EE/DSM Revenue Requirement for Residential Rider EE	Line 14 + Line 15	\$ 117,461,426	\$ 117,461,426
17	Total EE/DSM Revenue Requirement for Residential Rider EE (cents per kWh)	Line 6 + Line 13	0.5529	0.5529

Non-Residential Billing Factors for Rider 9 True-up (EMF) Components

18	Vintage Year 2014 EE True-up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 1, Line 25	\$ 104,651	118,573	(13,922.17)
19	Projected Year 2014 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 4	20,930,100,094	21,655,074,211	
20	EE Revenue Requirement Year 2014 EMF Non-Residential Rider EE (cents per kWh)	Line 25/Line 26 * 100	0.0005	0.0005	
21	Vintage Year 2014 DSM True-up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 1, Line 35	\$ (122,245)	(136,250)	14,004.77
22	Projected Year 2014 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 5	20,374,180,987	21,099,155,104	
23	DSM Revenue Requirement Year 2014 EMF Non-Residential Rider EE (cents per kWh)	Line 28/Line 29 * 100	(0.0006)	(0.0006)	
24	Vintage Year 2015 EE True-up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 2, Line 25	\$ 3,965,118	4,112,049	(146,931.24)
25	Projected Year 2015 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 6	20,544,651,200	21,269,625,317	
26	EE Revenue Requirement Year 2015 EMF Non-Residential Rider EE (cents per kWh)	Line 30/Line 31 * 100	0.0193	0.0193	
27	Vintage Year 2015 DSM True-up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 2, Line 35	\$ (483,451)	(501,279)	17,828.32
28	Projected Year 2015 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 7	20,143,794,641	20,868,768,758	
29	DSM Revenue Requirement Year 2015 EMF Non-Residential Rider EE (cents per kWh)	Line 34/Line 35 * 100	(0.0024)	(0.0024)	
30	Vintage Year 2016 EE True-up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 3, Line 35	\$ 25,532,272	26,454,724	(922,451.79)
31	Projected Year 2016 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 8	20,247,638,573	20,972,612,690	
32	EE Revenue Requirement Year 2016 EMF Non-Residential Rider EE (cents per kWh)	Line 34/Line 35 * 100	0.1261	0.1261	
33	Vintage Year 2016 DSM True-up (EMF) Revenue Requirement	R9 Miller Exhibit 2 pg. 3, Line 35	\$ 297,692	311,281	(13,589.00)
34	Projected Year 2016 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 9	19,846,124,458	20,571,098,575	
35	DSM Revenue Requirement Year 2016 EMF Non-Residential Rider EE (cents per kWh)	Line 34/Line 35 * 100	0.0015	0.0015	

Non-Residential Billing Factors for Rider 9 Prospective Components

Miller Exhibit 7, page 2

36	Vintage Year 2015 EE Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 2, Line 25	\$	4,047,296	4,183,188	(135,891.89)
37	Projected Program Year 2015 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 6		20,544,651,200	21,269,625,317	
38	EE Revenue Requirement Vintage 2015 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 40/Line 41 * 100		0.0197	0.0197	
39	Vintage Year 2016 EE Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 3, Line 4	\$	12,917,993	13,375,187	(457,193.62)
40	Projected Program Year 2016 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 8		20,247,638,573	20,972,612,690	
41	EE Revenue Requirement Vintage 2016 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 43/Line 44 * 100		0.0638	0.0638	
42	Vintage Year 2017 EE Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 4, Line 18	\$	9,130,462	9,466,867	(336,404.81)
43	Projected Program Year 2017 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 10		20,022,943,371	20,747,917,488	
44	EE Revenue Requirement Vintage 2017 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 46/Line 47 * 100		0.0456	0.0456	
45	Vintage Year 2018 EE Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 5, Line 25	\$	55,443,530	57,456,609	(2,013,078.37)
46	Projected Vintage 2018 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 12		20,022,943,371	20,747,917,488	
47	EE Revenue Requirement Vintage 2018 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 49/Line 50 * 100		0.2769	0.2769	
48	Vintage Year 2018 DSM Prospective Amounts Revenue Requirement	R9 Miller Exhibit 2 pg. 5, Line 25	\$	14,549,912	15,084,675	(534,762.98)
49	Projected Vintage 2018 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 7 pg. 3, Line 13		19,822,767,932	20,547,742,049	
50	DSM Revenue Requirement Vintage 2018 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 49/Line 50 * 100		0.0734	0.0734	
	Total EMF Rate			0.1444	0.1444	(4,542,392.77)
	Total Prospective Rate			0.4794	0.4794	

Total Revenue Requirements in Rider 9 from Non-Residential Customers

51	Vintage Year 2014 EE True-up (EMF) Revenue Requirement	Line 18		104,651	118,573	
52	Vintage Year 2014 DSM True-up (EMF) Revenue Requirement	Line 21		(122,245)	(136,250)	
53	Vintage Year 2015 EE True-up (EMF) Revenue Requirement	Line 24		3,965,118	4,112,049	
54	Vintage Year 2015 DSM True-up (EMF) Revenue Requirement	Line 27		(483,451)	(501,279)	
55	Vintage Year 2016 EE True-up (EMF) Revenue Requirement	Line 30		25,532,272	26,454,724	
56	Vintage Year 2016 DSM True-up (EMF) Revenue Requirement	Line 33		297,692	311,281	
57	Vintage Year 2015 EE Prospective Amounts Revenue Requirement	Line 36		4,047,296	4,183,188	
58	Vintage Year 2016 EE Prospective Amounts Revenue Requirement	Line 39		12,917,993	13,375,187	
59	Vintage Year 2017 EE Prospective Amounts Revenue Requirement	Line 42		9,130,462	9,466,867	
60	Vintage Year 2018 EE Prospective Amounts Revenue Requirement	Line 45		55,443,530	57,456,609	
61	Vintage Year 2018 DSM Prospective Amounts Revenue Requirement	Line 48		14,549,912	15,084,675	
	Total Non-Residential Revenue Requirement in Rider 9	Sum (Lines 51-61)	\$	125,383,230	\$ 129,925,623	

Duke Energy Carolinas, LLC
 DSM/EE Cost Recovery Rider 10
 Docket Number E-7 Sub 1164
 Revised Forecasted 2018 kWh Sales for Rate Period for Vintage Years 2014-2018

Fall 2016 Sales Forecast - kWhs		Forecasted 2018 Sales		
North Carolina Retail:				
Line				
1	Residential	21,243,226,519		
2	Non-Residential	35,641,166,806		
3	Total Retail	56,884,393,325		
NC Opt Out Sales		Total Usage	Opt-Outs	Net Usage
Vintage 2014 Actual Opt Out				
4	EE	35,641,166,806	14,711,066,712	20,930,100,094
5	DSM	35,641,166,806	15,266,985,819	20,374,180,987
Vintage 2015 Actual Opt Out				
6	EE	35,641,166,806	15,096,515,606	20,544,651,200
7	DSM	35,641,166,806	15,497,372,165	20,143,794,641
Vintage 2016 Actual Opt Out				
8	EE	35,641,166,806	15,393,528,233	20,247,638,573
9	DSM	35,641,166,806	15,795,042,348	19,846,124,458
Vintage 2017 Estimated Opt Out				
10	EE	35,641,166,806	15,618,223,435	20,022,943,371
11	DSM	35,641,166,806	15,818,398,874	19,822,767,932
Vintage 2018 Estimated Opt Out				
12	EE	35,641,166,806	15,618,223,435	20,022,943,371
13	DSM	35,641,166,806	15,818,398,874	19,822,767,932

Note: In the original Rider 9 filing, lighting kWh was not excluded from non-residential. This revised forecast excludes lighting kWh. Since we are collecting approved rates over a reduced amount of kWh, we will not be collecting the original revenue requirement as approved. The true-up to collect this revenue will be collected in Rider 10 through a revised estimate of revenue collected.

Rider EE (NC)
ENERGY EFFICIENCY RIDERAPPLICABILITY (North Carolina Only)

Service supplied under the Company's rate schedules is subject to approved adjustments for new energy efficiency and demand-side management programs approved by the North Carolina Utilities Commission (NCUC). The Rider Adjustments are not included in the Rate Schedules of the Company and therefore, must be applied to the bill as calculated under the applicable rate.

As of January 1, 2019, cost recovery under Rider EE consists of the four year term program, years 2014-2017, as well as rates under the continuation of that program for years 2018 -2019 as outlined below. This Rider applies to service supplied under all rate schedules, except rate schedules OL, FL, PL, GL and NL for program years 2014-2019.

GENERAL PROVISIONS

This Rider will recover the cost of new energy efficiency and demand-side management programs beginning January 1, 2014, using the method approved by the NCUC as set forth in Docket No. E-7, Sub 1032, Order dated October 29, 2013, as revised by Docket No. E-7, Sub 1130, Order dated August 23, 2017.

TRUE-UP PROVISIONS

Rider amounts will initially be determined based on estimated kW and kWh impacts related to expected customer participation in the programs, and will be true-up as actual customer participation and actual kW and kWh impacts are verified. If a customer participates in any vintage of programs, the customer is subject to the true-ups as discussed in this section for any vintage of programs in which the customer participated.

RIDER EE OPT OUT PROVISION FOR QUALIFYING NON-RESIDENTIAL CUSTOMERS

The Rider EE increment applicable to energy efficiency programs and/or demand-side management programs will not be applied to the energy charge of the applicable rate schedule for customers qualified to opt out of the programs where:

- a. The customer has notified the Company that it has implemented, or has plans for implementing, alternative energy efficiency measures in accordance with quantifiable goals.
- b. Electric service to the customer must be provided under:
 1. An electric service agreement where the establishment is classified as a "manufacturing industry" by the Standard Industrial Classification Manual published by the United States Government and where more than 50% of the electric energy consumption of such establishment is used for its manufacturing processes. Additionally, all other agreements billed to the same entity associated with the manufacturing industry located on the same or contiguous properties are also eligible to opt out.
 2. An electric service agreement for general service as provided for under the Company's rate schedules where the customer's annual energy use is 1,000,000 kilowatt hours or more. Additionally, all other agreements billed to the same entity with lesser annual usage located on the same or contiguous properties are also eligible to opt out.

The following additional provisions apply for qualifying customers who elect to opt out:

For customers who elect to opt out of energy efficiency programs, the following provisions also apply:

- Qualifying customers may opt out of the Company's energy efficiency programs each calendar year only during the annual two-month enrollment period between November 1 and December 31 immediately prior to a new Rider EE becoming effective on January 1. (Qualifying new customers have sixty days after beginning service to opt out).
- Customers may not opt out of individual energy efficiency programs offered by the Company. The choice to opt out applies to the Company's entire portfolio of energy efficiency programs.
- If a customer participates in any vintage of energy efficiency programs, the customer, irrespective of future opt out decisions, remains obligated to pay the remaining portion of the lost revenues for each vintage of energy efficiency programs in which the customer participated.
- Customers who elect to opt out during the two-month annual enrollment period immediately prior to the new Rider EE becoming effective may elect to opt in to the Company's energy efficiency programs during the first 5 business days of March each calendar year. Customers making this election will be back-billed retroactively to the effective date of the new Rider EE.

For customers who elect to opt out of demand-side management programs, the following provisions also apply:

- Qualifying customers may opt out of the Company's demand-side management program during the enrollment period between November 1 and December 31 immediately prior to a new Rider EE becoming effective on January 1 of the applicable year. (Qualifying new customers have sixty days after beginning service to opt out).

Duke Energy Carolinas, LLC

Electricity No. 4
North Carolina Thirteenth Revised Leaf No. 62
Superseding North Carolina Twelfth Revised Leaf No. 62Rider EE (NC)
ENERGY EFFICIENCY RIDER

- If a customer elects to participate in a demand-side management program, the customer may not subsequently choose to opt out of demand-side management programs for three years.
- Customers who elect to opt out during the two-month annual enrollment period immediately prior to the new Rider EE becoming effective may elect to opt in to the Company's demand-side management program during the first 5 business days of March each calendar year. Customers making this election will be back-billed to the effective date of the new Rider EE.

Any qualifying non-residential customer that has not participated in an energy efficiency or demand-side management program may opt out during any enrollment period, and has no further responsibility to pay Rider EE amounts associated with the customer's opt out election for energy efficiency and/or demand-side management programs.

ENERGY EFFICIENCY RIDER ADJUSTMENTS (EEA) FOR ALL PROGRAM YEARS

The Rider EE amounts applicable to the residential and nonresidential rate schedules for the period January 1, 2019 through December 31, 2019 including utility assessments are as follows:

<u>Residential</u>	Vintage 2014, 2015 ¹ , 2016 ¹ , 2017 ¹	0.1091¢ per kWh
	Vintage 2017 ² , 2018 ² , 2019 ²	0.4229¢ per kWh
	Total Residential Rate	0.5320¢ per kWh
<u>Nonresidential</u>		
	Vintage 2014 ³	
	Energy Efficiency	(0.0063)¢ per kWh
	Demand Side Management	(0.0002)¢ per kWh
	Vintage 2015 ³	
	Energy Efficiency	0.0025¢ per kWh
	Demand Side Management	(0.0025)¢ per kWh
	Vintage 2016 ³	
	Energy Efficiency	(0.0131)¢ per kWh
	Demand Side Management	(0.0015)¢ per kWh
	Vintage 2017 ³	
	Energy Efficiency	0.3863¢ per kWh
	Demand Side Management	0.0005¢ per kWh
	Vintage 2018 ³	
	Energy Efficiency	0.0723¢ per kWh
	Demand Side Management	0.0031¢ per kWh
	Vintage 2019 ³	
	Energy Efficiency	0.3283¢ per kWh
	Demand Side Management	0.0910¢ per kWh
	Total Nonresidential	0.8604¢ per kWh

¹ Includes the true-up of program costs, shared savings and lost revenues from Year 1 of Vintage 2017 and Year 2 of Vintage 2016, and Year 3 of 2015.

² Includes prospective component of Vintage 2017, 2018 and 2019.

³ Not Applicable to Rate Schedules OL, FL, PL, GL, and NL.

Each factor listed under Nonresidential is applicable to nonresidential customers who are not eligible to opt out and to eligible customers who have not opted out. If a nonresidential customer has opted out of a Vintage(s), then the applicable energy efficiency and/or demand-side management charge(s) shown above for the Vintage(s) during which the customer has opted out, will not apply to the bill.

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Mar 07 2018

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of	)	
Application of Duke Energy Carolinas, LLC	)	
for Approval of Demand-Side Management	)	
and Energy Efficiency Cost Recovery Rider	)	APPLICATION OF
Pursuant to N.C. Gen. Stat. § 62-133.9 and	)	DUKE ENERGY CAROLINAS,
Commission Rule R8-69	)	LLC FOR APPROVAL OF
	)	RIDER 10

Duke Energy Carolinas, LLC ("DEC," "Company," or "Applicant"), pursuant to North Carolina General Statutes ("N.C. Gen. Stat.") § 62-133.9 and North Carolina Utilities Commission (the "Commission") Rule R8-69, hereby applies to the Commission for approval of its demand-side management ("DSM") and energy efficiency ("EE") cost recovery rider, Rider EE, for 2019 ("Rider 10"). Rider 10 has been calculated in accordance with the Company's DSM/EE cost recovery mechanism approved by the Commission in Docket No. E-7, Sub 1032, as revised in Docket No. E-7, Sub 1130. The prospective components of Rider 10 include estimates of the revenue requirements for Vintage 2019¹ DSM and EE programs, as well as an estimate of the second year of net lost revenues for Vintage 2018 EE programs, and the third year of net lost revenues for Vintage 2017 EE programs. The Rider 10 Experience Modification Factor ("EMF") includes the following true-ups: a true-up of Vintage 2014 DSM/EE programs, a true-up of Vintage 2015 DSM/EE programs, a true-up of Vintage 2016 DSM/EE programs, and a true-up of Vintage

¹ A vintage year is the twelve-month period in which a specific DSM or EE measure is installed for an individual participant or a group of participants. Each vintage is referred to by the calendar year of its respective rate period (e.g., Vintage 2019).

2017 DSM/EE programs.

In support of this Application, DEC respectfully shows the Commission the following:

1. The Applicant's general offices are located at 550 South Tryon Street, Charlotte, North Carolina, and its mailing address is:

Duke Energy Carolinas, LLC
P. O. Box 1006
Charlotte, North Carolina 28201-1006

2. The names and addresses of Applicant's attorneys are:

Kendrick Fentress, Associate General Counsel
Duke Energy Carolinas, LLC
P.O Box 1551/NCRH 20
Raleigh, North Carolina 27602
(919) 546-6733
kendrick.fentress@duke-energy.com

Molly McIntosh Jagannathan
Troutman Sanders LLP
One Wells Fargo, Suite 3400
301 South College Street
Charlotte, North Carolina 28202
(704) 998-4074
molly.jagannathan@troutman.com

3. N.C. Gen. Stat. § 62-133.9(d) authorizes the Commission to approve an annual rider to the rates of electric public utilities to recover all reasonable and prudent costs incurred for the adoption and implementation of new DSM/EE programs. Recoverable costs include, but are not limited to, all capital costs, including cost of capital and depreciation expense, administrative costs, implementation costs, incentive payments to program participants, and operating costs. Such rider shall consist of the utility's forecasted cost during the rate period and an EMF rider to collect the difference between the utility's actual reasonable and

prudent costs incurred during the test period and actual revenues realized during the test period. The Commission is also authorized to approve incentives for adopting and implementing new DSM/EE programs, including appropriate rewards based on capitalization of a percentage of avoided costs achieved by DSM/EE measures.

4. The Company's cost recovery mechanism is described in the Agreement and Stipulation of Settlement DEC reached with the Public Staff, the North Carolina Sustainable Energy Association, Environmental Defense Fund, Southern Alliance for Clean Energy, the South Carolina Coastal Conservation League, Natural Resources Defense Council, and the Sierra Club filed with the Commission on August 19, 2013 (the "Stipulation"). The Commission approved the cost recovery mechanism as described in the Stipulation, as well as DEC's portfolio of DSM/EE programs, in its *Order Approving DSM/EE Programs and Stipulation of Settlement* issued October 29, 2013 ("Sub 1032 Order"). In addition, the Commission approved certain revisions to the cost recovery mechanism in its *Order Approving DSM/EE Rider, Revising DSM/EE Mechanism, and Requiring Filing of Proposed Customer Notice* issued August 23, 2017 in Docket No. E-7, Sub 1130. The approved cost recovery mechanism is designed to allow DEC to collect revenue equal to its incurred program costs for a rate period plus a Portfolio Performance Incentive based on shared savings achieved by DEC's DSM/EE programs, and to recover net lost revenues for EE programs only.

5. Rule R8-69(b) provides that the Commission will each year conduct a proceeding for each electric public utility to establish an annual DSM/EE rider to recover DSM/EE related costs.

6. Pursuant to the provisions of N.C. Gen. Stat. § 62-133.9 and Rule R8-69, DEC requests the establishment of Rider 10 to recover: (1) a prospective component consisting of the estimated revenue requirements associated with Vintage 2019 of DEC's current portfolio of DSM/EE programs, the second year of net lost revenues for Vintage 2018 of DEC's EE programs, and the third year of net lost revenues for Vintage 2017 of DEC's EE programs; and (2) an EMF component truing up Vintage 2014, Vintage 2015, Vintage 2016 and Vintage 2017 of DEC's DSM/EE programs.

7. Pursuant to the provisions of N.C. Gen. Stat. § 62-133.9 and Rule R8-69, the Company requests Commission approval of the following annual billing factors (all shown on a cents per kilowatt hour ("¢/kWh") basis, including gross receipts tax and regulatory fee):

Residential Billing Factors	¢/kWh
Residential Billing Factor for Rider 10 Prospective Components	0.4229
Residential Billing Factor for Rider 10 EMF Components	0.1091

Non-Residential Billing Factors for Rider 10 Prospective Components	¢/kWh
Vintage 2017 EE participant	0.0831
Vintage 2018 EE participant	0.0723
Vintage 2018 DSM participant	0.0031
Vintage 2019 EE participant	0.3283
Vintage 2019 DSM participant	0.0910

Non-Residential Billing Factors for Rider 10 EMF Components	¢/kWh
Vintage 2014 EE participant	(0.0063)
Vintage 2014 DSM participant	(0.0002)
Vintage 2015 EE participant	0.0025
Vintage 2015 DSM participant	(0.0025)
Vintage 2016 EE participant	(0.0131)
Vintage 2016 DSM participant	(0.0015)
Vintage 2017 EE participant	0.3032
Vintage 2017 DSM participant	0.0005

Consistent with the Commission's *Order on Motions for Reconsideration* issued on June 3, 2010 in Docket No. E-7, Sub 938 and the Sub 1032 Order, Rider 10 will be in effect for the twelve-month period January 1, 2019 through December 31, 2019. Also in accordance with these Orders, the test period for the Vintage 2017 EMF component is the period January 1, 2017 through December 31, 2017; the test period for the Vintage 2016 EMF component is the period January 1, 2016 through December 31, 2016; the test period for the Vintage 2015 EMF component is the period January 1, 2015 through December 31, 2015; the test period for the Vintage 2014 EMF component is the period January 1, 2014 through December 31, 2014.

8. The Company has attached hereto, as required by Rule R8-69, the direct testimony and exhibits of witnesses Carolyn T. Miller and Robert P. Evans in support of the requested change in rates.

WHEREFORE, the Company respectfully prays:

That consistent with this Application, the Commission approve the changes to

its rates as set forth in paragraph 7 above.

Respectfully submitted, this the 7th day of March 2018.

By: Molly M. Jagannathan
Kendrick Fentress
Associate General Counsel
Duke Energy Corporation
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ATTORNEYS FOR DUKE ENERGY CAROLINAS,
LLC

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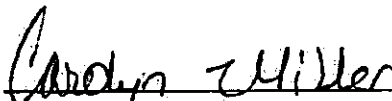
Mar 07 2018

VERIFICATION

STATE OF NORTH CAROLINA)
)
COUNTY OF MECKLENBURG) DOCKET NO. E-7, SUB 1164

Carolyn T. Miller, being first duly sworn, deposes and says:

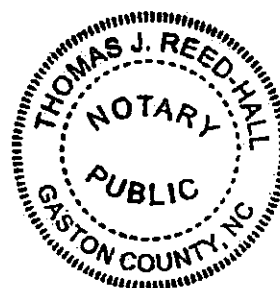
That she is MANAGER, RATES AND REGULATORY STRATEGY for Duke Energy Carolinas, LLC, applicant in the above-titled action; that she has read the foregoing Application and knows the contents thereof; that the same is true except as to those matters stated on information and belief; and as to those matters, she believes them to be true.


Carolyn T. Miller

Sworn to and subscribed before me
this the 5 day of March, 2018.


Notary Public

My Commission Expires: 7-30-22





I/A

CHRISTOPHER NEME, PRINCIPAL

EDUCATION

M.P.P., University of Michigan, 1986
B.A., Political Science, University of Michigan, 1985

EXPERIENCE

2010-present: Principal (and Co-Founder), Energy Futures Group, Hinesburg, VT
1999-2010: Director of Planning & Evaluation, Vermont Energy Investment Corp., Burlington, VT
1993-1999: Senior Analyst, Vermont Energy Investment Corp., Burlington, VT
1992-1993: Energy Consultant, Lawrence Berkeley National Laboratory, Gaborone, Botswana
1986-1991: Senior Policy Analyst, Center for Clean Air Policy, Washington, DC

PROFESSIONAL SUMMARY

Chris specializes in analysis of markets for energy efficiency, renewable energy and strategic electrification measures and the design and evaluation of programs and policies to promote them. During his 25+ years in the clean energy industry, Mr. Neme has worked for energy regulators, utilities, government agencies and advocacy organizations in nearly 30 states, 5 Canadian provinces and several European countries. He has defended expert witness testimony before regulatory commissions in ten different jurisdictions; he has also testified before several state legislatures.

SELECTED PROJECTS

- **Green Mountain Power (Vermont).** Support development and implementation of GMP's plan for reducing customers' direct consumption of fossil fuels. Also developed 10-year forecast different levels of promotion of residential heat pumps and electric vehicles. (2016 to present)
- **Ontario Energy Board:** Serve on gas DSM Evaluation Committee, advisory committee on gas efficiency potential study and advisory committee on carbon price forecast. (2015-present)
- **Alberta Energy Efficiency Alliance.** Drafting white paper on key ways in which consideration of "efficiency as a resource" could be institutionalized. Paper followed presentations to government agencies and others on behalf of the Pembina Institute. (2017 to present)
- **Green Energy Coalition (Ontario).** Represent coalition of environmental groups in regulatory proceedings, utility negotiations and stakeholder meetings on DSM policies (including integrated resource planning on pipeline expansions) and utility proposed DSM Plans. (1993 to present)
- **New Jersey Board of Public Utilities.** Serve on management team responsible for statewide delivery of New Jersey Clean Energy Programs. Lead strategic planning; support regulatory filings, cost-effectiveness analysis & evaluation work. (2015 to present)
- **Natural Resources Defense Council (Illinois, Michigan and Ohio).** Critically review multi-year DSM plans and IRPs of Illinois, Michigan and Ohio utilities. Draft and defend regulatory testimony. Represent NRDC in stakeholder-utility processes governing development of efficiency policy manuals, annual TRM updates, annual NTG updates, etc. (2010 to present)
- **Toronto Atmospheric Fund.** Helped draft an assessment of efficiency potential from retrofitting of cold climate heat pumps into electrically heated multi-family buildings (2017).



CHRISTOPHER NEME, PRINCIPAL

- ***E4TheFuture.*** One of five authors of a new 2017 National Standard Practice Manual for cost-effectiveness analysis of energy efficiency and other distributed resources. (2016-present)
- ***Regulatory Assistance Project - U.S.*** Provide guidance on efficiency policy and programs. Lead author on strategic reports on achieving 30% electricity savings in 10 years, using efficiency to defer T&D system investments, & bidding efficiency into capacity markets. (2010 to present)
- ***Regulatory Assistance Project - Europe.*** Provide support on efficiency policies in the UK, Germany, and other countries. Reviewed EU policies on Energy Savings Obligations, EM&V protocols, and related issues. Drafted policy brief on efficiency feed-in-tariffs. (2009 to present)
- ***Northeast Energy Efficiency Partnerships.*** Helped manage Regional EM&V forum project estimating savings for emerging technologies, including field study of cold climate heat pumps. Led assessment of best practices on use of efficiency to defer T&D investment. (2009 to 2015)
- ***Ontario Power Authority.*** Managed jurisdictional scans on leveraging building efficiency labeling requirements and non-energy benefits. Led staff workshop on efficiency as an alternative to T&D investment. (2012-2015)
- ***Vermont Public Interest Research Group.*** Conducted comparative analysis of the economic and environmental impacts of fuel-switching from oil/propane heating to either natural gas or efficient, cold climate electric heat pumps. Filed regulatory testimony on findings. (2014-2015)
- ***National Association of Regulatory Utility Commissioners (NARUC).*** Assessed alternatives to first year savings goals to better promote longer-lived savings. (2013)
- ***California Investor-Owned Utility.*** Senior advisor on EFG project to compare the cost of saved energy across ~10 leading U.S. utility portfolios. The research sought to determine if there are discernable differences in the cost of saved energy related to utility spending in specific non-incentive categories, including administration, marketing, and EM&V. (2013)
- ***New York State Energy Research and Development Authority (NYSERDA).*** Led residential & renewables portions of several statewide efficiency potential studies. (2001 to 2010)
- ***DC Department of the Environment (Washington DC).*** Part of VEIC team administering the DC Sustainable Energy Utility (SEU). Helped characterize the DC efficiency market and supported the design of efficiency programs that the SEU will be implementing. (2011 to 2012)
- ***Ohio Public Utilities Commission.*** Senior Advisor to a project to develop a web-based Technical Reference Manual (TRM). The TRM includes deemed savings assumptions, deemed calculated savings algorithms and custom savings protocols. It was designed to serve as the basis for all electric and gas efficiency program savings claims in the state. (2009 to 2010)
- ***Vermont Electric Power Company.*** Led residential portion of efficiency potential study to assess alternatives to new transmission line. Testified before Public Service Board. (2001-2003)
- ***Efficiency Vermont.*** Served on Sr. Management team. Supported initial project start-up. Oversaw residential planning, input to regulators on evaluation, input to regional EM&V forum, development of M&V plan and other aspects of bidding efficiency into New England's Forward Capacity Market (FCM), and development and updating of nation's first TRM. (2000 to 2010)



EVALUATION OF DUKE ENERGY'S HELPING HOME FUND

October 15, 2017



EXECUTIVE SUMMARY

Between 2015 and 2017, Duke Energy worked with the North Carolina Community Action Association (NCCAA) and Lockheed Martin to administer the Helping Home Fund, a program helping low-income customers improve their health and safety and manage their energy costs.

Duke Energy was the funding sponsor, with Duke Energy Carolinas and Duke Energy Progress providing a total of \$20 million to support appliance replacement, health and safety measures, weatherization, and heating/cooling replacement and repair in participating homes. NCCAA was chosen as the program administrator and contracted with Lockheed Martin to assist with implementation.

In all, the Helping Home Fund reached 3,516 homes with an average of \$5,151 in performed work per home. The Helping Home Fund was designed to leverage additional funding as well, including the State Weatherization Assistance Program (NCWAP), which consists of U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP) and Low Income Home Energy Assistance Program (LIHEAP) funds, the PNC Home Beautification Fund, and funds from the North Carolina Housing Finance Agency (NCHFA). Without the Helping Home Fund, more than 40 percent of the participating homes would have been deferred due to funding limitations and program guidelines in the NCWAP. During the time period that the Helping Home Fund was operating, the program spent \$20 million. Leveraged funding included:

- NCWAP: \$17 million
- PNC Home Beautification: \$250,000
- NCHFA: \$234,000

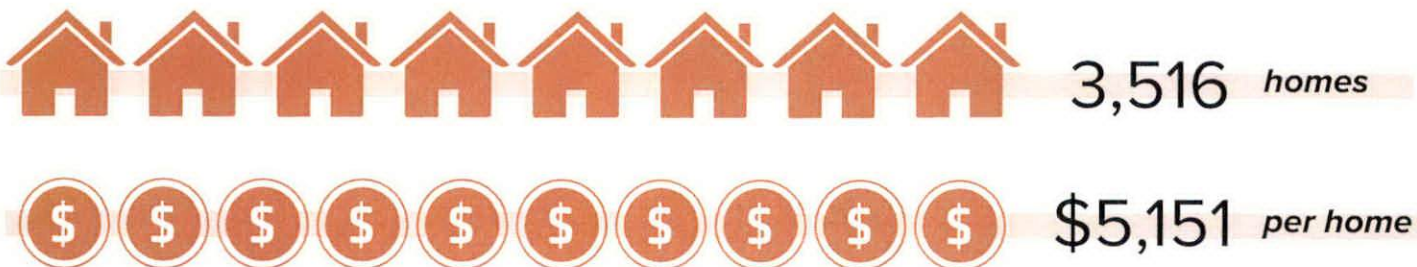
Funds were also leveraged from other private funding sources, such as the City of Raleigh and City of Charlotte Urgent Repair Programs, but we were unable to obtain data on their funding levels.

Duke Energy had an interest in understanding the full impact of the program, including leveraging opportunities, and economic and non-energy impacts, such as health, safety and comfort. A number of approaches were taken for this effort. First, the team developed two surveys that were distributed to participating homeowners and service providers. The surveys gauged views of the Helping Home Fund and how people thought the program impacted the lives of families and the larger community. Second, a review of prior research evaluated the monetized values of potential energy and non-energy benefits associated with the program.

Results from the surveys demonstrated that both homeowners and service providers had a very favorable view of the Helping Home Fund. Homeowners noted that they felt safer, more comfortable and healthier in their homes, and reported financial savings that would allow them to pay for other necessities. Service providers applauded the program for its flexibility, staff and communication. Furthermore, the literature review of other low-income weatherization programs revealed that homeowners experienced a variety of non-energy benefits. Conservative estimates in the literature found monetized values for these benefits to be between \$4,500 and \$10,000 per home.

With the success of the program and the merger between Duke Energy and Piedmont Natural Gas, an additional \$2.5 million will be used for a similar program to provide assistance to even more income-qualified families in North Carolina.

The Helping Home Fund reached 3,516 homes with an average of \$5,151 in performed work per home.



INTRODUCTION

As a result of the Duke Energy North Carolina rate cases in 2013, Duke Energy allocated \$20 million (\$10 million from Duke Energy Carolinas [DEC] and \$10 million from Duke Energy Progress [DEP]) to assist low-income customers. For both utilities, the \$10 million was allocated in the following ways: \$3 million was used for health and safety measures and appliance replacement (for DEP, some of these funds also went toward weatherization; DEC has a separate weatherization program), and \$7 million was used for heating/cooling system replacement and repair. The actual breakdown of the funds at the time of this report can be seen in **Table 1**.

The program provided income-qualified customers with repairs and energy efficiency upgrades at no cost.

This program, known as the Helping Home Fund, ran from January 2015 to May 2017. The goal of the funding was to assist low-income customers. Duke Energy saw an opportunity to provide assistance that did not currently exist by providing health and safety repairs, new energy-efficient appliances, and heating systems to help homeowners manage energy costs and increase their disposable income. To meet this

goal, the Helping Home Fund worked primarily through weatherization service providers as well as other non-profit agencies that serve families at or below 200 percent of federal poverty guidelines. The program provided income-qualified customers with repairs and energy efficiency upgrades at no cost.

The Helping Home Fund was funded by Duke Energy and administered by the North Carolina Community Action Association (NCCAA). NCCAA partnered with Lockheed Martin, who provided the database for data tracking and reporting, and quality assurance (QA) and quality control (QC). The Helping Home Fund was designed to leverage the State Weatherization Assistance Program (NCWAP) and other public/private funding sources. The funds were allocated to local North Carolina weatherization service providers and several non-profit agencies who completed the projects and were reimbursed once the work was completed. The program was allowed to use 10 percent of the funding for administrative purposes, with 5 percent going to the administrator and 5 percent to the service providers.

The monies were transmitted in total to the NCCAA to manage and deposited at PNC Bank. As a result, PNC Bank suggested that the NCCAA apply for a grant from their foundation, which ultimately provided another \$250,000 for Helping Home Fund recipients for external beautification or maintenance, such as painting, roof repairs or landscaping.

TABLE 1 • HELPING HOME FUND BREAKDOWN

	DEC	DEP	TOTAL
APPLIANCE REPLACEMENT	\$950,343	\$620,399	\$1,570,742
HEALTH & SAFETY	\$1,765,387	\$873,998	\$2,639,385
HEATING/COOLING REPLACEMENT/REPAIR	\$6,395,779	\$6,388,239	\$12,784,018
WEATHERIZATION TIER 1		\$100,217	\$100,217
WEATHERIZATION TIER 2		\$1,018,932	\$1,018,932
PROJECT TOTAL	\$9,111,509	\$9,001,785	\$18,113,294
AVERAGE PER HOUSE			\$5,151
ADMINISTRATION	\$928,344	\$928,344	\$1,856,688
OVERALL TOTAL	\$10,039,853	\$9,930,129	\$19,969,982

INTRODUCTION

Because of federal regulations, the NCWAP has a limited amount of funding it can use per house for health, safety and energy measures. If repair monies were not available from either federal or local sources, the home would be deferred. The Helping Home Fund filled this gap, allowing the NCWAP to serve customers who would have otherwise been deferred by service providers by providing the funding to make the needed repairs. Furthermore, North Carolina weatherization agencies' energy efficiency improvements waitlist had been experiencing lengthy delays, and customers were not getting work scheduled or completed. The funding provided additional services to customers and helped to leverage federal and state funds for maximum customer benefit and impact.

The Helping Home Fund focused on four main components:

- 01 • Health and safety
- 02 • Appliance replacement
- 03 • Weatherization (in DEP territory only)
- 04 • Heating/cooling system replacement and repair

In DEC territory, homes already had access to weatherization through the existing energy efficiency Weatherization Program.

LM Captures is Lockheed Martin's tracking and reporting system that service providers used to enter the individual home data for the program. The database required comprehensive data input for customer, home and project details to determine eligibility and track program expenditures and measure level detail by project type. All program activities, including QA/QC and reimbursement request/fulfillment, were also reported.

Funds for health and safety were originally capped at \$800 per home, but due to customer needs learned throughout the program, the limit was later raised

to \$3,000. Health and safety measures included bath fans, vapor barriers, roof repairs, electrical/plumbing repairs, ingress/egress repairs, range repair and replacement, and water heater repair and replacement. Appliance replacement also started with an allotment of \$800 per home, but this amount was increased to \$2,000. This work included replacing inefficient appliances with ENERGY STAR® refrigerators, clothes washers, clothes dryers and room air conditioners.

Weatherization services were broken down into two tiers.

TIER 1

Tier 1 weatherization was for homes using < 7 kilowatt-hours (kWh) per square foot, < \$0.23 per square foot oil/liquid propane (LP) gas heat, or < \$0.38 per square foot oil/LP gas heat and water heating. Up to \$600 was allotted for the following measures:

- ✓ Heating system tune-up and cleaning
- ✓ Heating system repair
- ✓ Water heater wrap and pipe wrap for electric water heaters
- ✓ Cleaning or replacement of electric dryer vents
- ✓ ENERGY STAR-certified compact fluorescent lamps (CFLs)
- ✓ Low-flow showerheads and aerators
- ✓ Weatherstripping doors and windows
- ✓ Energy education

INTRODUCTION

TIER 2

Tier 2 weatherization was provided to homes using ≥ 7 kWh per square foot, $\geq \$0.23$ per square foot oil/LP gas heat, or $\geq \$0.38$ per square foot oil/LP gas heat and water heating. Here, up to \$4,000 was provided for the following:

-  Tier 1 services
-  Attic insulation
-  Air sealing
-  Duct sealing/repair
-  Wall insulation
-  Crawl space insulation
-  Floor insulation

Since heating/cooling systems account for the majority of an energy bill, 70 percent of the monies were allocated to improve customers' heating systems. The intent was to decrease customers' energy use, thereby providing them with more disposable income. Existing electric furnaces, electric baseboards, and oil or propane systems were replaced with high efficiency heat pumps (minimum 14 Seasonal Energy Efficiency Ratio [SEER] and 8.2 Heating Seasonal Performance Factor [HSPF]). In addition, many homes were found to have elderly residents with wood stoves, and new heating systems and ductwork were installed in these situations as well.

A maximum of \$10,000 could be used for heating/cooling system replacement and repair (\$6,000 max for heating/cooling and an additional \$4,000 to upgrade electrical and/or install new ductwork). Consistent with Tier 2 weatherization, heating/cooling system replacement and repair required energy usage per year to meet the following requirements:

- ≥ 7 kWh per square foot,
- $\geq \$0.23$ per square foot oil/LP gas heat, or
- $\geq \$0.38$ per square foot oil/LP gas heat and water heating.

High efficiency mini splits were allowed when a home did not have a centrally ducted system or the duct repairs exceeded an estimated threshold. Funds could also be used to upgrade the electrical system or repair/replace duct systems. All of the ductwork had to be insulated and sealed with mastic. Homes also had to have been weatherized as part of the installation of a new heating/cooling system, requiring proper sizing of the system.

STUDY DESCRIPTION AND METHOD

As the Helping Home Fund was nearing completion, Duke Energy had an interest in understanding the impacts of non-energy benefits among program participants and implementation service providers. Non-energy benefits can include a wide variety of improvements, such as those to economics, health, safety, quality of life and comfort. Studying and documenting these benefits helps determine the true cost-effectiveness of home energy programs and interventions.

In performing the analysis, the first step was to narrow down the array of potential non-energy benefits to specific ones to evaluate within the Helping Home Fund. The team selected health,

safety, comfort, improved disposable income, and economic sustainability/community impact.

To measure these impacts, two surveys were developed (see Appendix I). One survey went to participating homeowners, and a second survey was administered to the service providers that implemented the program measures and coordinated the work. To supplement the survey results and further characterize the outcomes of the Helping Home Fund, the team conducted a literature review to monetize the non-energy benefits. The results of this component of the program can be found later in the report.

NON-ENERGY BENEFITS



HEALTH

Health included measures such as the number of doctor's visits, decreased asthma symptoms and other homeowner health effects.



SAFETY

Safety included homeowners' accessibility or ability to move about their homes, as well as electrical and durability issues.



COMFORT

Comfort addressed whether occupants felt that their homes were more comfortable.



DISPOSABLE INCOME

Disposable income looked at whether the Helping Home Fund provided homeowners with additional income to spend on other necessities.



ECONOMIC SUSTAINABILITY

Economic sustainability/community impact included effects on service provider employment and home deferrals, among others.

PROGRAM SUMMARY

The Helping Home Fund served 3,516 homes with an average of two projects each (e.g., appliance replacement, heating/cooling system replacement/repair, health and safety measures). Homeowner incomes had to be below 200 percent of federal poverty guidelines to participate. The homes were assessed by local service providers serving low-

income customers to determine what measures were most appropriate. The work was then completed by either service provider-based crews or subcontractors.

The homes were reported and tracked on a project level. Table 2 shows the average dollars spent per project category.

TABLE 2 • AVERAGE DOLLARS SPENT PER PROJECT

	APPLIANCES	HEALTH & SAFETY	HEATING/COOLING REPLACEMENT/REPAIR	WEATHERIZATION TIER 1	WEATHERIZATION TIER 2	TOTAL
TOTAL SPENT	\$1,570,742	\$2,639,385	\$12,784,018	\$100,217	\$1,018,932	\$18,113,294
NUMBER OF PROJECTS	1,676	2,731	1,878	323	488	7,096
PROJECT TOTAL	\$937	\$966	\$6,807	\$310	\$2,088	\$2,553

Through the heating/cooling system replacements and repairs, more than 1,300 homes went from non-functioning to functioning heating systems (Table 3).

TABLE 3 • PRE-RETROFIT HEATING BREAKDOWN OF HOMES RECEIVING HEATING REPLACEMENT

EXISTING FUEL TYPE	NUMBER FUNCTIONING	NUMBER NON-FUNCTIONING	TOTAL
WOOD	7	26	33
ELECTRICITY	410	1,060	1,470
KEROSENE	9	9	18
NATURAL GAS	1	14	15
OIL/LP	107	222	329
NO HEAT	0	13	13
TOTAL	534	1,344	1,878

Note. All heating types converted to heat pumps with a SEER of 14 or greater.

The majority of homes (92 percent) were single-family detached and mobile homes. The remaining were multifamily units and townhomes or condominiums (Table 4).

TABLE 4 • BREAKDOWN OF HOMES SERVED BY THE HELPING HOME FUND

	SINGLE-FAMILY DETACHED	MOBILE HOME	MULTIFAMILY (5+ UNITS)	MULTIFAMILY (2-4 UNITS)	TOWNHOME/ CONDO	TOTAL
NUMBER OF HOMES	2,362	858	196	67	33	3,516

PROGRAM SUMMARY

The subset of customers that responded to the homeowner survey provided information regarding the number of children, elderly, and individuals with disabilities or respiratory illness (Table 5). With these varying degrees of vulnerability, it can be difficult for occupants to stay in their homes. The Helping Home Fund was able to provide services to populations that may not have otherwise been reached.

TABLE 5 • HELPING HOME FUND SURVEY RESPONSE

OCCUPANT CATEGORY	NUMBER OF OCCUPANTS
UNDER THE AGE OF 18	112
OVER THE AGE OF 60	275
IDENTIFY AS DISABLED	237
IDENTIFY AS HAVING A RESPIRATORY ILLNESS	171

Note. Included data from 317 survey respondents.

The Helping Home Fund spending on each participating home ranged from \$114.32 to \$19,825.31, with an average of \$5,151. Additional funding sources were used on these homes as well, including the NCWAP, PNC Home Beautification and the NCHFA (Table 6). NCWAP funds were used

"We are no longer cold during the winter and hot in the summer."

for heating/cooling systems and weatherization, while PNC Home Beautification focused on exterior improvement, such as landscaping, painting and roofing. NCHFA funds were used for heating/cooling systems, weatherization and structural repairs. Therefore, although a house received an average of \$5,151 through the Helping Home Fund, additional work may have been performed thanks to these other funding sources.

TABLE 6 • HELPING HOME FUND LEVERAGED FUNDS (2015-2017)

SOURCE	AMOUNT LEVERAGED
NCWAP (INCLUDES DOE WAP AND LIHEAP)	\$17,321,491
PNC HOME BEAUTIFICATION	\$250,000
NCHFA	\$234,000

Note. Unable to obtain data for amount leveraged from other private funding.

To ensure that measures were installed correctly and funding was properly documented, randomly selected QC inspections were performed on completed jobs. At least 10 percent of homes with health and safety projects, appliance replacement or weatherization measures received QC, along with at least 25 percent of homes with heating/cooling system replacements and repairs.

QC inspectors conducted monitoring visits to evaluate effectiveness, safety, workmanship and compliance with program guidelines. They also addressed educational opportunities with local providers and customers during the on-site verification process. The process included a paper file review as well as an on-site visit with representation from a service provider. All measures installed with Duke Energy funds were verified to be present and compliant with work orders and materials invoiced. The quality of the workmanship was also evaluated, and QC inspection results were documented and discussed.

All QC documentation, on-site inspection details, reports and actions were uploaded into LM Captures. QC return visits were minimal, and all issues were addressed.

SURVEYS

The surveys sought to gauge the non-energy benefits and impacts of the Helping Home Fund. The full surveys, as well as responses from homeowners and service providers, can be found in Appendices I-III.

Homeowner Survey

The homeowner survey was designed to understand how the Helping Home Fund affected program occupants. Homeowners were randomly selected, and outbound calls were conducted by Duke Energy's call center for approximately one month. A total of 901 homeowners were contacted, with 317 completing the survey (a 35 percent completion rate).

The homeowners overall had a highly positive view of the Helping Home fund. Ninety-two percent of respondents reported feeling safer in their homes, and 81 percent said they have better home accessibility (e.g., getting into and out of the home). Additionally, 91 percent said the improvements from

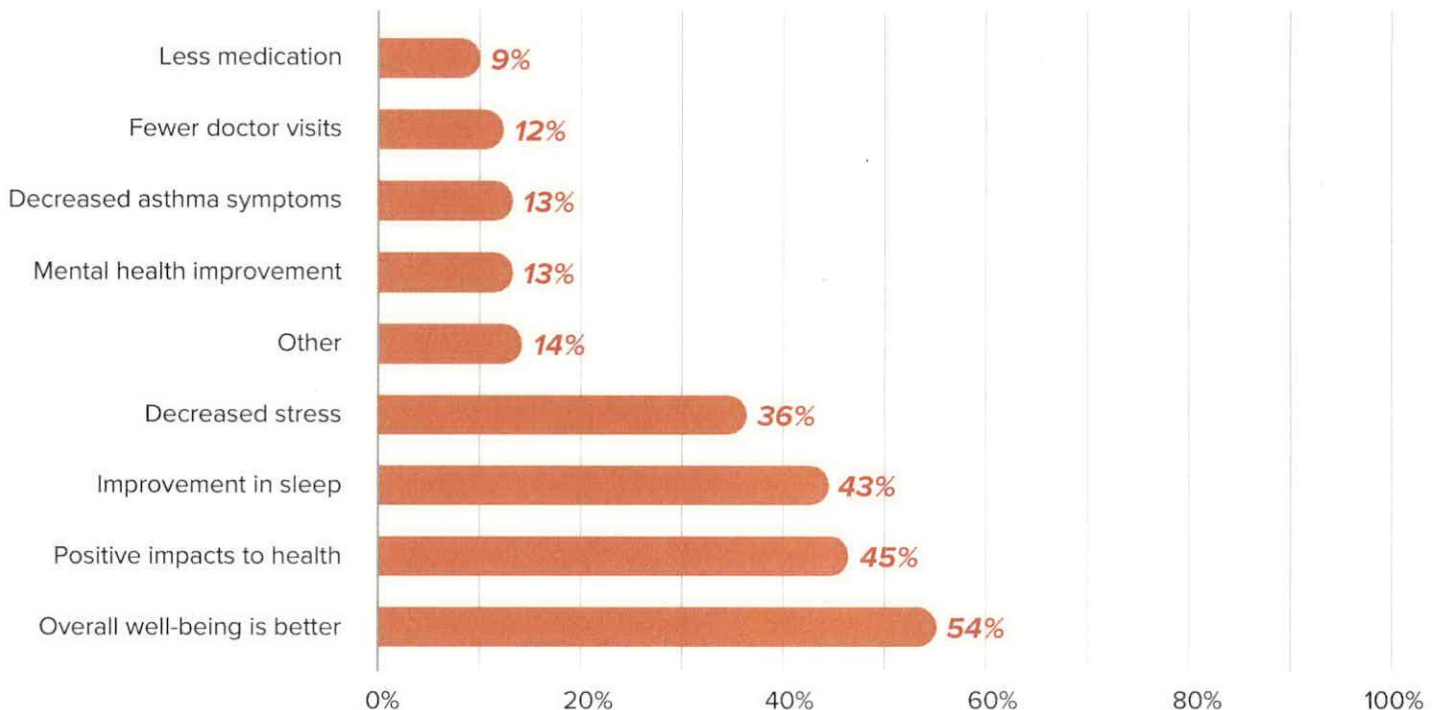
the Helping Home Fund made it possible for them to stay in their current location, and 96 percent responded that their lives have been made easier in some form. "They did a good job and it really helped me a long way," said one homeowner. "They put windows in my home so it feels warmer and I truly appreciate everything that you all did."

"My light bill has been a lot lower, so that helps me have extra money. My water bill has been lower too. It has been a lot better than in years past."

Forty-nine percent of respondents indicated that the Helping Home Fund upgrades definitely allowed them to have more money available to pay for other necessities, while an additional 29 percent said they somewhat did.

FIGURE 1 • HOMEOWNER SURVEY RESPONSES

Survey question: Have you (or any family members) noticed any positive health impacts due to the upgrades to your home? Check all that apply.



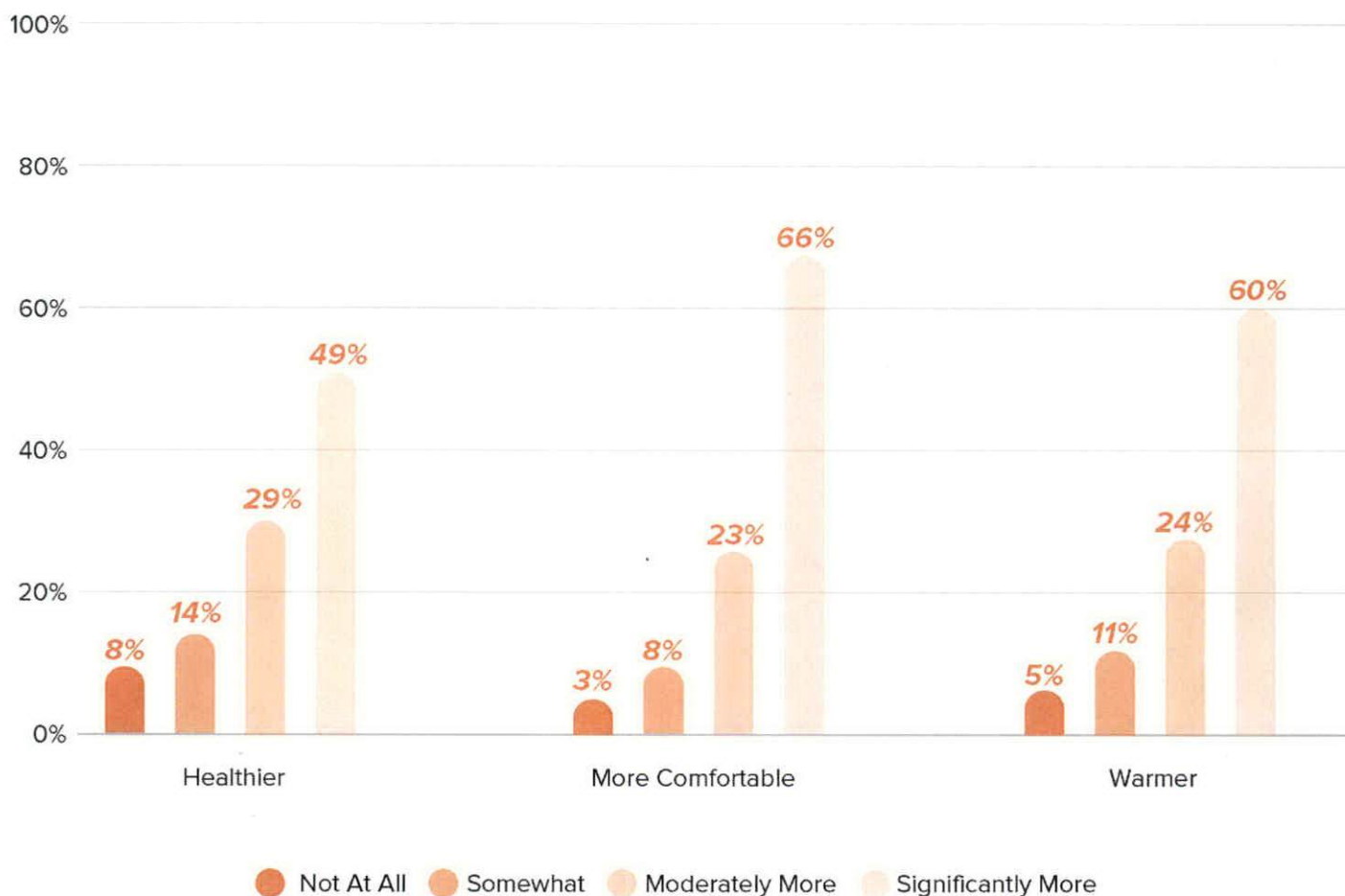
SURVEYS

Homeowners reported a number of positive health impacts for themselves and their families, including better overall well-being, sleep improvement and decreased stress (Figure 1). “If it wasn’t for Duke I

could still be in the hospital. Heat affects me very bad with my medical condition so to feel cooling has made a world of difference. I am now able to keep my body temperature down,” reported one homeowner. Likewise, homeowners said they generally feel healthier, more comfortable and warmer as a result of

FIGURE 2 • HOMEOWNER SURVEY RESPONSES

Survey question: Are you healthier / more comfortable / warmer in your home because of the improvements made?



SURVEYS

Service Provider Survey

The service provider survey was developed to assess the effects of the Helping Home Fund on participating service providers, their crews and subcontractors, and the homeowners they served. Twenty-four participating service providers were sent the survey via email, and all responded. The service providers had a very positive view of the Helping Home Fund. They applauded the staff, communication, benefits to homeowners, flexibility and reimbursement process. According to one service provider, “Overall, (the) Helping Home Fund has been both impactful for the community and rewarding for our agency to serve others in need. We would love to be considered for future opportunities.”

In particular, service providers praised the Helping Home Fund for its effect on low-income homeowners: Every provider responded that the program had a positive influence. They reported that an average of 44 percent of the homes they worked on through the Helping Home Fund would have otherwise been deferred.

Fifty-four percent of respondents felt there was a strong positive influence of the Helping Home Fund on the local community. In terms of service provider hiring, 46 percent of service providers indicated that the program affected staff employment, 4 percent said it somewhat did, and 50 percent said it did not.

The most commonly completed measures by service provider-based (i.e., agency-based) crews included insulation and air sealing, duct sealing and structural repairs to roofs, stairs, railings and windows (Table 7). Subcontractors also performed substantial work. Service providers reported that during 2015 and 2016, subcontractors were hired to help complete over 90 percent of jobs, which included electrical work, heating/cooling system repair or replacement, and plumbing (Table 7). All service providers noted that the quality of the contractor crews was either good or excellent, and most (83 percent) did not have difficulty finding contractors to work on homes. When there was difficulty, it was typically regarding electrical contractors.

“It has allowed us to serve more people in our counties that would not have gotten any service this fiscal year.”

The service providers reported receiving funding from a variety of sources in addition to the Helping Home Fund. As noted earlier, more than \$17 million was leveraged from the NCWAP, NCHFA and PNC Home Beautification, as well as other undisclosed funding sources. Service providers noted some variability and uncertainty in funding over the last five years. One

TABLE 7 • SERVICE PROVIDER SURVEY RESPONSES

Survey question: What measures did you install with an agency-based crew? What measures did you install using subcontractors? Check all that apply.

MEASURE	NUMBER OF SERVICE PROVIDERS USING AGENCY-BASED CREWS	NUMBER OF SERVICE PROVIDERS USING SUBCONTRACTORS
PLUMBING	2	19
ELECTRICAL	2	23
HEATING/COOLING REPAIR/REPLACEMENT	2	22
INSULATION/AIR SEALING	13	13
DUCT SEALING	13	11
STRUCTURAL REPAIRS	11	13

SURVEYS

service provider stated, “With the support of (the) Helping Home Fund, we were able to expand service delivery to Duke Energy Progress customers. Our agency’s primary funding source was limited for FY 2017; therefore, Helping Home Funds were leveraged

and resulted in more customers receiving home improvements to support energy use reduction and for some improved health conditions. In addition, the opportunity to complete appliance replacement might not have happened without Helping Home Funds.”

MONETIZING NON-ENERGY IMPACTS

To get a better understanding of the monetization of non-energy impacts of the Helping Home Fund, we examined prior studies and program analyses. We relied heavily on a study conducted by Tonn, Rose, Hawkins, and Conlon (2014), which monetized non-energy benefits from the DOE WAP. This study was relevant for a number of reasons, including its focus on low-income housing and the overlap in non-energy measures being explored. It also used a robust sample size, attributing results to more than 80,000 homes.

Tonn et al. (2014) used a variety of approaches to monetize the non-energy impacts. The researchers evaluated pre- and post-weatherization survey data, relied on objective cost data from existing databases where available, and then performed monetization exercises to calculate the lifetime benefit over 10 years. The researchers categorized their results into three tiers based on the reliability of the outcomes. Tier 1 estimates were the most reliable, followed by Tiers 2 and 3. Tonn et al. also considered the value of lives saved in their analyses.

We also included data from a literature review from Schweitzer and Tonn (2003). The researchers reviewed approximately 25 articles; some were reports that presented primary research from

previous weatherization programs, and others used a meta-analytic approach to examine multiple studies. This effort led to a large set of non-energy benefits, many of which were not addressed by Tonn et al. (2014). Using the available data from the prior literature, Schweitzer and Tonn selected a point estimate for individual non-energy benefits to represent an average value that could be applied to nationwide weatherization programs. In this case, monetized values were calculated using a lifetime benefit over 20 years.

Tables 8 through 12 contain the relevant non-energy benefit monetization estimates from Tonn et al. (2014) and Schweitzer and Tonn (2003). We took certain steps to err on the side of caution with the data to avoid overestimating the monetized values. For Tonn et al., we de-rated their Tier 2 estimates (by 50 percent) and Tier 3 estimates (by 75 percent). We also did not take into account the value of lives saved. For Schweitzer and Tonn, when calculating the monetized value of all non-energy impacts, we only took into account the environmental benefit associated with natural gas, the lower value, and not electricity. All estimates were converted to 2017 dollars using historical consumer price index data.

MONETIZING NON-ENERGY IMPACTS

TABLE 8 • MONETIZATION OF ECONOMIC AND SOCIAL BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
INCREASED PROPERTY VALUE		\$244.80
DIRECT AND INDIRECT EMPLOYMENT		\$1,089.36
AVOIDED UNEMPLOYMENT BENEFITS		\$159.12
NATIONAL SECURITY		\$436.56
REDUCED MOBILITY		\$378.08
LOST RENTAL		\$1.36
IMPROVED WORKPLACE PRODUCTIVITY (SLEEP)	\$512.17	
IMPROVED HOUSEHOLD PRODUCTIVITY (SLEEP)	\$375.44	
FEWER MISSED DAYS AT WORKS	\$227.62	
WATER/SEWER SAVINGS		\$368.56
REDUCED NEED FOR SHORT-TERM LOANS	\$39.99	
REDUCES TRANSACTION COSTS		\$50.32
TOTAL	\$1,155.22	\$2,728.16

TABLE 9 • MONETIZATION OF HEALTH AND SAFETY BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
CO POISONING*	\$4.19	
FEWER FIRES	\$50.04	\$92.48
FEWER ILLNESSES		\$74.80
THERMAL STRESS (COLD)	\$194.28	
THERMAL STRESS (HEAT)	\$95.79	
ASTHMA RELATED	\$2,270.09	
REDUCED NEED FOR FOOD ASSISTANCE	\$940.16	
INCREASED ABILITY TO AFFORD PRESCRIPTIONS	\$1,090.01	
REDUCED LOW-BIRTH WEIGHT BABIES FROM HEAT-OR-EAT COMPROMISE	\$55.96	
TOTAL	\$4,700.52	\$167.28

MONETIZING NON-ENERGY IMPACTS

TABLE 10 • MONETIZATION OF UTILITY SERVICE BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
CARRYING COST OF ARREARAGES		\$77.53
BAD DEBT WRITE-OFF		\$121.04
FEWER SHUTOFFS AND RECONNECTIONS FOR DELINQUENCY		\$10.88
AVOIDED RATE SUBSIDIES		\$28.56
INSURANCE SAVINGS		\$1.36
REDUCED GAS SERVICE EMERGENCY CALLS		\$137.36
FEWER NOTICES AND CUSTOMER CALLS		\$8.16
TRANSMISSION AND DISTRIBUTION LOSS REDUCTION		\$65.28
AVOIDED SHUTOFFS AND RECONNECTIONS		\$23.12
TOTAL	\$0	\$473.29

TABLE 11 • MONETIZATION OF ENVIRONMENTAL BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
AIR EMISSIONS - ELECTRICITY		\$1,324.64
AIR EMISSIONS - NATURAL GAS		\$435.20
OTHER BENEFITS		\$745.64
TOTAL	\$0	\$2,505.48

TABLE 12 • MONETIZATION OF ALL NON-ENERGY BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
ALL	\$5,856	\$4,550

Note. The total monetized value from Schweitzer and Tonn (2003) excludes air emissions associated with electricity.

MONETIZING NON-ENERGY IMPACTS

The two studies reveal that weatherization and other energy efficiency upgrades can produce a wealth of non-energy benefits with values in the thousands of dollars. At the same time, it is worth noting the lack of overlap in the impacts that Tonn et al. (2014) and Schweitzer and Tonn (2003) examined. Therefore, the overall value of non-energy benefits may be even higher than those reported here.

Given the similarities in the housing stock, occupants and measures installed in the Tonn et al. (2014) and Schweitzer and Tonn (2003) studies when compared to the Helping Home Fund, it is possible to assume that participants in the Helping Home Fund received a similar level of non-energy benefits. Even with our conservative estimates, the non-energy benefits associated with the Helping Home Fund, then, could approach an average of \$10,000 per home (the sum of the total non-energy benefits from the two studies). Indeed, the homeowner survey results confirm that those participating in the program did receive non-energy benefits, from health improvements to enhanced comfort and increased ability to stay in their homes. These benefits can be

particularly important for occupants who are children, elderly, or have disabilities, respiratory illness or asthma.

The Helping Home Fund was not designed to reduce overall energy use but rather to provide other benefits to low-income customers, such as improved health, comfort and safety. For example, approximately 35 percent of the homes had non-functioning heating systems and the program was able to provide new systems to these customers. The program also provided new washers, dryers and room air conditioning units, since other programs typically did not address this. However, because the program highly leveraged the NCWAP, we can assume that these customers would also receive energy benefits. Based on the literature review, DOE WAP achieves average lifetime energy savings of \$4,890 per home (Tonn, Carroll et al. 2014).

Table 13 summarizes the average costs and benefits for participating homes based on total invested funds and estimated benefits from the literature review.

TABLE 13 • SUMMARY OF COSTS AND BENEFITS FOR HELPING HOME FUND

	AVERAGE PRESENT VALUE PER HOME	PRESENT VALUE FOR TOTAL HOMES
ENERGY BENEFITS (COST SAVINGS) ¹	\$5,115.33	\$17,985,500
NON-ENERGY BENEFITS ²	\$10,312.83	\$36,259,910
ECONOMIC AND SOCIAL	\$3,883.38	\$13,653,964
HEALTH AND SAFETY ³	\$4,775.32	\$16,790,025
UTILITY SERVICE	\$473.29	\$1,664,088
ENVIRONMENTAL ⁴	\$1,180.84	\$4,151,833
TOTAL BENEFITS	\$15,428.16	\$54,245,410
TOTAL COSTS	\$10,124.37	\$35,597,294
HELPING HOME FUNDS	\$5,151.68	\$18,113,294
LEVERAGED FUNDS	\$4,972.69	\$17,484,000

1. Value based on Tonn, Carroll et al. (2014)

2. Value (and subcategories below) based on summed benefits of Tonn et al. (2014) and Schweitzer and Tonn (2003)

3. Uses the lower monetized estimate of fewer fires, from Tonn et al. (2014)

4. Excludes air emissions associated with electricity from Schweitzer and Tonn (2003)

CHALLENGES AND LESSONS LEARNED

- ✓ The NCCAA was the appropriate choice for administering these funds, forming a valuable relationship with Duke Energy. The NCCAA provided access to a network of service providers who were already intricately involved in low-income communities across the state. These service providers were able to quickly access homeowners who met the requirements for participation in the Helping Home Fund. The NCCAA also saw value in being involved with individual agencies throughout the implementation of the program, getting to know their particular challenges and strengths. With this experience and data, the NCCAA is able to provide recommendations to the NCWAP to improve overall performance.
- ✓ The NCCAA collaborated with Lockheed Martin to assist with the administrative duties of the program. Lockheed Martin is a strong partner, providing invaluable recommendations for program implementation, QC and data documentation. In addition, Lockheed Martin oversaw key communication and training with service providers that kept the program running smoothly. The ability to adapt and be flexible with service providers, who had varying degrees of experience with implementing programs, was essential.
- ✓ Funding levels for individual measures (health and safety - \$800 and appliances - \$800) were initially too low, resulting in huge requests for exceptions. As a result of these requests, funding for health and safety was increased to \$3,000 per home and appliances to \$2,000 per home in 2016.
- ✓ Funding allocation for administrative costs (5 percent) was insufficient for some of the service providers; however, this could not be changed due to the regulatory filing.
- ✓ Delays in obtaining contracts and funding between the service providers and the NCWAP caused issues with completing projects in a timely manner.
- ✓ While the data collection process was thorough, some data was not collected during this initial spending cycle but was later learned through the customer surveys. In the future, the Helping Home Fund may consider including the following in data collection:
 - **Number of occupants by age group (to capture number of elderly/children)**
 - **Number of occupants with asthma or disabilities**
 - **Tracking of leveraged funds per home**
 - **Tracking of when measures are installed**
 - **Pre-retrofit survey of homeowners**
- ✓ Now that the service providers have been oriented and trained to the program, it should be less costly for them to support the program.
- ✓ Based on some of the homeowner surveys, it was determined that they did not realize Duke Energy had funded some of their repairs. While a brochure was developed and available for the agencies to provide homeowners, its use may have dwindled over time. There is an opportunity for better marketing of the program to both homeowners and local communities.
- ✓ There were mixed reviews of LM Captures, which is understandable when working with a network of providers with varying degrees of experience with technology and availability of local resources. Role-based dashboard reports provided updates for status and planning. The NCCAA and Lockheed Martin worked closely with service providers to provide one-on-one customer service and support during program launch.

CHALLENGES AND LESSONS LEARNED

and throughout the program. Feedback from service providers has resulted in ongoing updates to LM Captures, including easily identified required fields, less data entry on the home page, additional options in drop-down selections and revisions to heating/cooling data entry fields.



Programs such as the Helping Home Fund are not designed to pass energy efficiency tests. Therefore, the utility only receives funds in special cases, such as during rate cases or mergers. However, evaluating non-energy benefits in addition to traditional energy benefits can help determine the true cost-effectiveness of these programs, and allow the utility to capture the benefits such a program can offer.



Weatherization service providers are limited in the funds they can spend on health and safety measures, causing many homes to be deferred each year. Working closely with service providers ensured that they used the Helping Home Fund monies in the anticipated manner. This funding source, along with others such as the NCHFA's

Single Family Rehab program, works well with WAP so that homes can be retrofit, and homeowners benefit from access to multiple programs that can address different needs. As one example, the Macon County Housing Department "was able to use the monies from the Helping Home Fund in conjunction with other programs such as the Urgent Repair Program, LIHEAP Heating and Air Repair and Replacement Program (HARRP), Single Family Rehab Program and the Weatherization Program."



Leveraging other programs, while a benefit, was also a challenge for some service providers. It took time for providers to learn how to effectively use different funding sources on the same homes. To help them get up to speed, the Helping Home Fund used multiple methods to train service providers, including webinars, on-site training and ongoing mentoring. Overall, they found that one-on-one training was more effective than group training. The QC field visits were an additional training opportunity for service providers.

NEXT STEPS

The Helping Home Fund recently received an additional \$2.5 million when Duke Energy merged with Piedmont Natural Gas. This money will go toward a similar program and will be used in the following ways: \$800 for heating/cooling repair and/or maintenance, \$3,000 for health and safety, and \$2,000 for appliance replacement (refrigerators, washers, dryers, room air conditioners and dehumidifiers). Duke Energy decided to reduce the

allocation toward heating/cooling systems due to the limited funding, and to allow the funds to be available over a 12-18 month period.

With the success of the Helping Home Fund, the team is sharing its experience with stakeholders around the country so that others may learn from it and build upon it.

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ABBREVIATIONS AND ACRONYMS

DEC	Duke Energy Carolinas
DEP	Duke Energy Progress
DOE	Department of Energy
HHF	Helping Home Fund
HSPF	Heating Seasonal Performance Factor
LIHEAP	Low Income Home Energy Assistance Program
LM Captures	Database developed and maintained by Lockheed Martin
kWh	Kilowatt-hours
LP	Liquid Propane
NCCAA	North Carolina Community Action Association
NCHFA	North Carolina Housing Finance Agency
NCWAP	North Carolina (State) Weatherization Assistance Program
PNC Home Beautification	Fund offered by PNC bank
QA	Quality Assurance
QC	Quality Control
SEER	Seasonal Energy Efficiency Ratio
WAP	Weatherization Assistance Program

APPENDIX I • SURVEYS

HOMEOWNER SURVEY

Intro Section: (Provide context and explain the value of participating in the survey)

Hello, my name is _____ and I am calling on behalf Duke Energy. I'm calling today because your household participated in a program to receive free home improvements through the XXX Weatherization Agency. As part of this program, a contractor would have come into your home and installed free energy saving products and made home improvements. We would like to take just a few minutes to ask you a few questions.

Are you the person in your household who is most familiar with the improvements that were made to your home?

- ☐ Yes ☐ Don't know
☐ No ☐ Refused

We're speaking with customers who have participated in the program to complete a short survey to learn about their experience and satisfaction with the program. This is not a sales call, and all of your responses will be kept confidential.

Homeowner questions

1. How many children under the age of 18 currently live in the home?
2. How many people over the age of 60 currently live in the home?
3. How many residents in your household identify as disabled?
4. How many residents in your household identify as having a respiratory illness (e.g., asthma)?
5. Can you recall any of the weatherization improvements that were specifically made to your home?
6. Are you aware that the Duke Energy Helping Home Funds were used in your home?
7. If yes, do you know which improvements were paid for by HHF?

- 8-10. Are you healthier / more comfortable / warmer in your home because of the improvements made?
☐ Not at all ☐ Moderately more
☐ Somewhat ☐ Significantly more
11. Have the upgrades to your home allowed you to have more money available to pay for other necessities?
☐ Definitely ☐ Somewhat ☐ No
12. Have you (or any family members) noticed any positive health impacts due to the upgrades to your home? Check all that apply.
☐ Positive impacts to health, Less doc visits, overall well-being is better, mental health improvement, improvement in sleep, decreased stress, less medication, decreased asthma symptoms, Other (fill in the blank)
13. Have the improvements made on your house made it possible for you to remain at home (as opposed to needing to move to another location)?
☐ Yes ☐ No
14. Has your life been made easier through these upgrades?
☐ Yes ☐ No
15. Do you have better accessibility or access to your home because of these upgrades (e.g., ability to get in and out of your home)?
☐ Yes ☐ No
16. Do you feel safer in your home (e.g., from injury due to durability issues)?
☐ Yes ☐ No ☐ Somewhat
(If yes or somewhat, please describe)
17. Any other comments regarding Duke Energy's Helping Home Fund you would like to share?

That is all the questions I have today. Thank you so much for your time and have a great day.

APPENDIX I • SURVEYS

Service Provider Survey

Duke Energy launched the Helping Home Fund in North Carolina in January 2015. This fund was designed to assist low-income customers with managing their energy costs while also addressing health and safety. As the first round of funding comes to a close, we are reaching out to participating Weatherization Agencies to hear your feedback. We want to learn about your experience with the program, as well as gather data on how the program impacted local communities. We sincerely appreciate you taking the time to provide responses to the following questions.

Service provider questions

1. Contact Info:
 - ☐ Name
 - ☐ Agency
2. Has the Helping Home Fund had a positive impact on the low-income homeowners that you serve?
 - ☐ Yes, Somewhat, No
3. Have you noticed any positive effects on the local community (beyond the occupants of the homes) from your participation in the Helping Home Program?
 - ☐ Yes, Somewhat, No
4. What % of homes were you able to work on that would have been deferred because of the Helping Home Fund?
5. Did the Helping Home Program have an impact on how many staff your agency employed during the program years?
 - ☐ Yes, Somewhat, No
6. What types of funding does your agency receive on an annual basis? Check all that apply.
 - ☐ LIHEAP
 - ☐ NCHFA
 - ☐ DOE Weatherization
 - ☐ Utility Funds
 - ☐ PNC Beautification Funding
 - ☐ Private Funds
 - ☐ Other (_____)
7. Has that funding varied over the last five years? If yes, please explain to what degree it has varied.
8. What measures did you install with an agency-based crew?
 - ☐ Plumbing
 - ☐ Electrical
 - ☐ HVAC Repair or Replacement
 - ☐ Insulation/Air Sealing
 - ☐ Duct Sealing
 - ☐ Structural Repairs (Roof, Stairs, Railing, Windows)
9. Did the Helping Home Fund impact your ability to retain an agency-based work crew?
 - ☐ Yes, Somewhat, No
10. What measures did you install using subcontractors?
 - ☐ Plumbing
 - ☐ Electrical
 - ☐ HVAC Repair or Replacement
 - ☐ Insulation/Air Sealing
 - ☐ Duct Sealing
 - ☐ Structural Repairs (Roof, Stairs, Railing, Windows)
11. How was the overall quality of contractor crews?
 - ☐ Excellent / Good / Fair / Poor (If fair or poor, please explain what was lacking)
12. Did your agency have difficulty finding local contractors to work on homes?
 - ☐ Yes, Somewhat, No
13. If yes, any suggestions of what could help remedy this situation?
14. If yes, how did this affect what work was completed?

APPENDIX I • SURVEYS

15. If yes, what type of contractors did you have having trouble finding?
 - Plumbing
 - Electrical
 - HVAC Repair or Replacement
 - Insulation/Air Sealing
 - Duct Sealing
 - Structural Repairs (Roof, Stairs, Railing, Windows)
16. What percentage of jobs did you hire subcontractors to help you complete the work in 2015 and 2016?
17. If the Helping Home Fund was to be continued as a program, what improvements / changes would you suggest?
18. What worked well about the program?
19. Were there any houses or families that stood out with regard to the impact you observed from participation in the program?
20. Is there anything you want to tell us about your experience with this program?
21. Can we contact you with additional questions?
If yes, Name, email address, phone number.

APPENDIX II • HOMEOWNER RESPONSES

I really like the program. Years before I didn't know about different things to make my home efficient. I have told people about it too. I feel like Duke Energy really tried to help people. Thank you so much.

I am so amazed by all Blue Ridge took care of for me with my new ac, the insulation, the moisture barrier the sensor for carbon monoxide and the replacing of my duct work. I am also happy to learn that Duke Energy had a hand in this too. Kudos to Duke Energy. Keep doing what you all doing. I have a testimony about everything that was done for me. I am so grateful. Mr. Dale and his crew were amazing. They did an outstanding job. They gave me a sense of everything going to be alright. The inspector was also great and offered his number to if anything should go wrong with my unit to call him. They did everything they said and much much more. This program is great for older disabled people like me. Anytime you need live customer data or feedback, please call me because I have nothing but good things to say about Blue Ridge and Duke Energy.

I just want to say everybody was nice and good to me. I thank you all. I love my new ac unit. I didn't know Duke Energy was responsible for doing that. I don't have to worry about that being done anymore. This is a good thing to have and I am thankful.

It was very helpful and nice to know assistance is out there for people who may be in a struggle. This is wonderful program also for older customers or those with health issues. I was more concerned with the efficiency of my home and the insulation has been great since added. I'm not worried about how often my units cycles on and off.

Everybody was so kind that came out. Very polite and were courteous to take off their shoes and not track dirt into the home. They also cleaned up after

themselves. Very thoughtful. I am thankful for the good Lord to make something like this available to me. The agency also helped replace the faucets and I got light bulbs. I am very thankful for this program. I'm not sure if anything can be done or if someone can direct me, but I am in need of windows. The windows I have now are terrible. I'm using duct tape and plastic to close them shut. I would just love if someone could help guide me to a agency or a program that can help me with my windows.

I thank God for the program. Really overwhelmed with joy and happiness that there was such a program available to help me.

Appreciate this program so much. Helped me because I would have had to find another job to have to done some of the things that were done, especially the new heat pump that was installed. I was blessed with this program and to be able to qualify. I am thankful. It didn't push me into anymore debt and although I am on a fixed income at 73 yrs. old I can still pay my bills and not scraping to make ends meet.

It's the best thing that happened to me, I couldn't afford to have these structure repairs done.... wonderful thing to happen to me it's highly blessing that fell on me!!! the best thing that could have happened for me! So grateful and thankful

All of them were very nice people. I am definitely appreciative of having an electrical heating system in my house. I feel safer now since I don't have to mess with the kerosene heating and worrying about it tipping over or not changing the filter or the possibility o hit burning down more house.

APPENDIX II • HOMEOWNER RESPONSES

Where the back porch was they built steps with a handrail... I was very appreciative, I needed the work done and had no idea how I was going to do it, I was so happy to qualify for the program.... it was a blessing.... I said my prayers and this happened... I really appreciate it....

I am so grateful.....when the contractors came out to my house - I cried.... I was so thankful..... I just want to thank everyone at duke energy from the bottom of my heart!! I don't have to worry about spinning my air unit by hand....it would freeze up and we would have to cut it off by the breakers.... old a/c unit finally stopped running... I had everyone in my family send a letter to the agency thanking them for everything....I send them Christmas cards, send them thank you notes.....

I thought my light bill would come down....but it hasn't.... put insulation in the roof, I appreciate all of the improvements that were done..... thankful for the help.... did a lot of work....

I appreciate the program and I would recommend it to anyone. You guys did such a wonderful job, from the bottom of my heart.

I'm so grateful...I. would like to say thank you from the bottom of my heart... it was getting to the crisis mode where I thought I would have to move..

They put insulation in attic, fixed heat ducts so heat would go down... it's a good thing to help people, it's a good fund if people don't have the income to put stuff in...it's good.

The contractors that were used were excellent, the approach, communication, they were a great group.

I would like to say thank you for the program, its been a life saver...

I think this is a great program. It helped me and my family. I hope more funding becomes available to help other families.

I must say that everyone who came out I was well pleased with. They were all kind mannered and promised to be here and was here at the time given. I am very happy with all things done and happy for my new ac unit. The guy who installed my new system explained everything to me very well.

The crew was great. I hope Duke will be about to continue this service. It has a lot of benefits to the community and I appreciate being able to have had the opportunity. I was out of work during the time my new system was installed so I am thankful. This program is one of the Best programs Duke offers and is an excellent service.

I am surprised that they were able to install my new heat and cool unit in my home because I have an old mill house so I am very grateful that they managed to install it. They did a great job. Everyone was nice and cleaned up after themselves. The inspectors were nice too. I wish I had money to contribute to this fund to help others in need because it is hard when you need improvements and don't have the money or means to pay for it. I am thankful Duke has a program like this and the weatherization agencies.

APPENDIX II • HOMEOWNER RESPONSES

I just think is Godsend. It is such a wonderful program for senior citizens, someone who is disabled that cannot afford to help themselves.

I'm on equalized payment and my bill went from 193 to 120 dollars per month... that extra savings can pay for another bill... I was flabbergasted when I qualified for the program, my heat pump was replaced, washing machine is great, (this machine wrings out clothes so less drying) replaced every light bulb... they were fabulous, couldn't believe it... I work at a non-profit organization, it was unreal, it I hadn't been worked there i wouldn't have known about the program.

Power bill has gone from 500 to 200 dollars per month. We were using space heaters to heat the home & a window unit to cool the home. I'm 100% satisfied that they helped me as much as they did!

My mother doesn't have to worry about buying oil this winter or using a space heater, which is dangerous. Many people do not know about this program and its because of the line of work I am in to why I found out. This has been a life saver. I do not live with my mother but my brother and I were there when everything was being done and I don't know what we would have done without this program because financially we don't have the money to have made these sort of upgrades. My mother is elderly and it gives her now a sense of being safer, warmer and saving money. She can also stay in her own home and not in a living facility. This program saved our lives and we thank you so much.

Having the new windows make me feel safer. Overall I feel better and I am grateful and thank you all.

It was just wonderful and I thank and appreciate it. It's fantastic that Duke can set aside funds to help people like myself that is on a fixed income and elderly. I am a widower and I can't thank you all enough for my new air conditioning system. I am very appreciative of everything and Duke.

The program has done a lot for a lot of people in the neighborhood. I hope that the program continues and help others. My light bill is very very good. I really enjoy the way it is. I hope they decide to do more of this program, especially for senior people who can't afford it. It really came in handy.

It's a great program to help people. I always worked and made it on my own and I have been very independent and then had a lot of medical issues. I have been in a pretty bad shape, and my stuff went out, so I was glad for that program.

I think is a great program for people who really need it. Sometimes is hard to make meets end, so anything that you can do to lower the electric bill, so I think you should do more of these programs.

I really want to thank you for having the program. It helped very much. I am in a lot of medications, so this helped me a lot. I have told people that Duke Energy helped me a lot and that's why I feel better. My bill also decreased and is very nice now.

The whole process was painless. I couldn't have asked for a better set of people. Mark and David were exception. They were great. Neat and courteous. I was so appreciative I cooked them a little something to say thanks.

APPENDIX II • HOMEOWNER RESPONSES

I never knew that Duke Energy was involved. The people that worked on the house they were some of the best people ever. The people that were hired were great people.

I think the program is amazing, for citizens who pay taxes like myself. These improvements allow me to tell others about this program. It's great. I am truly blessed.

They did so much!!! I think it's a real good program who need assistance.. when winter comes I'll really get the benefits.... appreciate the program, a really good program.... the people who administrated the program did a great job! They let me know all of the information.

I just think the program is wonderful. They did so much for us. Me and my sister live here and we are getting out there in age, fixed income, and we couldn't have done any of this without you guys. We don't have to worry about things breaking down. We know that we will be able to stay here for a long time. It is just wonderful!

They all did a fantastic job with the upgrades. After they finished my evaluation my refrigerator went out 4 days later, and it wasn't included.... thank the lord for that program and I was eligible for it. it's a great thing you do for people who can't afford those things, i don't know what i would have done... all the guys were very nice and friendly and everything I'm glad to be a duke energy customer.

Thanks a lot, if it weren't for the upgrades I don't know what me and my mom would do, keep

the program going... most definitely... if you can help anybody else like you've helped us, please continue. It was amazing for us!! It was an amazing experience.. the people that did the work were very considerate of me and my home...

I think Duke Energy is good, everything is great, all the upgrades, I couldn't ask for anything any better thanks to duke power, what would we do without them.

Door is a lot more secure, windows are more secure.... previously on windy days you could actually hear the wind blowing inside, it was so bad the wind would move the blinds... there was a lack of sealing previously... I'm glad to know Duke Energy was behind a lot of it.... this place really needed it (public housing).

I think it is a good program for people that are on social security and can't afford big bills. Everyone who came out was really nice and I thank Duke Energy for helping me.

The little boys that the installed the equipment were really nice, they did a good job.. Ms. Cannon wanted to make sure everyone got involved with the installation got an A+ After my a/c was installed I told my girls "I believe I've went to heaven when I woke up."

It has made a world of difference... wasn't aware Duke Energy HHF was involved.. couldn't believe I was eligible for all this equipment... I want to thank Duke Energy for being a company that has helped a consumer, feels very very good!! Absolutely remarkable...

APPENDIX II • HOMEOWNER RESPONSES

Don't have to use plug in heat, feel safer now.... not worried about fires as much, fire/gas alerts system make customer feel safer... Duke Energy has done a wonderful job to help the seniors, a lot of customers can't afford a heating/cooling system, we didn't have the money to put in heating/cooling system. The people who installed the system did a good job, cleaned up before they left.... appreciate washer/dryer, appreciate that..... customer really appreciates everything to the highest..... they removed a lot of stuff from the bottom of the house and they had it all removed... can't complain about any of the services.

Feel safer in home because old heaters were bought from Walmart and they weren't as safe. The HHF has been a blessing, it has made our lives so much easier... Hopefully others can benefit from this program... our electric bills have been cut in 1/2...

I appreciate everything that was done. I appreciate it so much that I wrote thank you letters to everyone with Community Action Opportunities. I am very thankful. I used to burn oil and I didn't have to spend the money this year. They also upgraded my wiring to get the new heat pump in. They took good care in what they did and with me.

I am glad that Duke Energy had the funds to help and assist the disabled. It helped me tremendously. It has helped my bill a lot. It has decreased my bill for about \$100 or so.

I am just glad that it was available and we qualified for it, for our HVAC. It was really expensive for us because of kerosene.

I am so thankful for everything that was done for me. Everyone who came out from each of the companies were very professional. Even the Inspectors were nice and not snobs. They assured me that all the electrical work was done correctly. They even installed a smoke and gas detector alarm.

I appreciate the new appliances, because they are more energy efficient. I know down the line they will help me with the electric bill. I greatly appreciate it.

Customer says he and his mother are on disability and it was blessing, and they really appreciated what Duke has done for them.

My personal opinion, I think this program is a blessing. I think that DE is one of the most wonderful companies to help people who are disabled. My husband passed away last year from cancer and this program helped me so much. I am so thankful.

I am greatly thankful for Duke Energy and this type of program. I was in shocked that I could apply and actually got accepted. They replaced my washer and dryer and my ac unit. They also gave me a refrigerator. My house was hot and moldy previous to the improvements and had deteriorated and had critters. I feel healthier overall. If it wasn't for Duke I could still be in the hospital. Heat affects me very bad with my medical condition so to feel cooling has made a world of difference. I am now able to keep my body temperature down. This is a mobile home so it isn't very efficient to begin with. Thank Duke and the weatherization Action Pathways for everything.

Everyone that was sent out was professional from start to finish. From the first inspector to the final inspection inspector. This was very convenient and mindful and everyone was friendly. Definitely keep

APPENDIX II • HOMEOWNER RESPONSES

this type of system around. I hope it can extend across the nation to others in need. I recommend it. Sad to hear that our fearless leader is trying to take programs away like this but I am grateful that it is available. Thank you so much for taking the time out to call to ask about my experience.

I would tell anyone that has the opportunity to do this to please do it immediately. Be careful who you said yes to, but if you know if it is a program that Duke Energy is responsible for, then they will take care of you.

I can breathe a lot better. You all did such a good job. Thank you all for doing this. I am so pleased. Everyone was so nice and the entire thing was enjoyable.

Keep program up. Elderly people need it. After you work all your life then to end up on a fixed income it's hard when things need to be fixed. Sometimes you have to choose to do without meds or maybe food depending on how bad it gets. I thank you all for doing this and keep it up.

Thankful for heat pump and thankful overall for everything that was done and is coming out to her home. During the winter customer feels a lot warmer and during the summer hot months she is a lot cooler. She has noticed breathing better although she doesn't have an issue breather. The quality of the air is better. In the past she has used fans but now feels better overall during the hot days.

If it wasn't for Duke Energy I don't know where I would have been this winter. With previously having to use a wood burner for heat which caused my sons breathing issues I am thank you to Duke for installing a new heat and cool system. I am tickled to death and so pleased of all the work that was done. I am so happy that Duke cares about people who need help and from the bottom of my heart I am thankful.

I was not aware Duke Energy money was used towards the improvements in my home so knowing this is great and I appreciate you all so much. I also like the tips you send out on think that can be done in the home to save money like hanging the clothes to dry instead of using the dryer.

I sure appreciate the things that were done because it helped to better the household. To have a better heating and cooling unit helped a greater deal. They also did the cracks and the bathrooms which was good too.

I have nothing negative to say about my experience. The air conditioning company (Mr. Richard) was awesome. Make note that Mr. Richard explained that this was one of the biggest jobs they have done. It was starting from scratch. No insulation in the attic, no central heat or cool. They also added vent in bathroom and a main breaker. I am so very grateful and thankful and happy to recommend this is anyone I know. I had to wait 2-3 years for this and I am thankful my home had all these improvements made. Tell the program manager that this was exceptional for Duke and the other workers to do.

They did a good job and it really helped me a long way. They put windows in my home so it feels warmer and I truly appreciate everything that you all did. One person in here asthma is as bad and overall we feel good and is comfortable. Thank you so much.

APPENDIX III • SERVICE PROVIDER RESPONSES

WARM was able to assist so many families with these funds. We are so grateful, and wish there were more funds to continue to help so many more families that are in need.

We worked very hard within a short time frame to spend the original allocation, plus the additional funds we requested and received. In about a two year period, we installed over 175 heating systems, a great many appliances, and health & safety and weatherization measures. In spite of all that was accomplished, the need exists for that much more to be done.

It has been an great program for all our eligible clients.

We look forward to continuing to work with Duke, it has been an outstanding opportunity for our agency as well as the customers that have been touched by this program. It has given us the opportunity to bundle services with other agencies to serve customers and provide additional measures in the home.

This was a great program, but the need is still great (10x).

The program support team was very helpful in assisting us from the start to finish and we were able to leverage the funding to provide needed services to the low-income folks CADA serves.

This was one of the best programs we have administered to assist homeowners with appliances. (2x).

The staff at NCCAA and the Martin group were very helpful and easy to work with. The requests for exceptions were processed quickly as were agency reimbursements. This program was a win-win for all involved.

Overall, HHF has been both impactful for the community and rewarding for our agency to serve others in need. We would love to be considered for future opportunities.

Joel Groce with NCCAA did an outstanding job administering the dollars.

This has been a great program. The Duke HHF staff were great and very knowledgeable. Payments were also processed timely.

The HHF program has helped offset many program expenses and has allowed us to continue working longer through the year until the new contract is completed and/or funding is released.

CONTRIBUTORS

Advanced Energy

Kelsy Green

Maria Mauceri

Matt Murray

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Duke Energy

Casey Fields

Lorrie Maggio

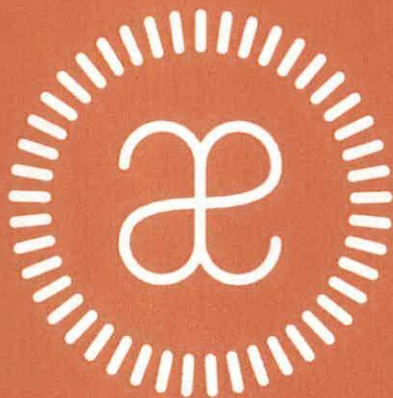
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North Carolina Community Action Association

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Testimonials

██████████ is a Columbus County resident that applied for weatherization due to the high cost of heating and cooling her home. ██████████ qualified for the HVAC replacement program through Duke and was able to get an energy efficient heat pump installed. ██████████ stated, "I don't have to seek assistance anymore with filling my tank to heat my home. I am very pleased with all of my services."



Old Unit



New Energy Efficient Unit



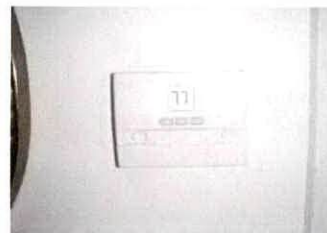
Non-Functioning CO Detector



New CO Detector



Old Thermostat



New Energy Efficient Thermostat

Helping Homes Fund gives Hickory woman her first heating and AC system ...

By KJ HIRAMOTO khiramoto@hickoryrecord.com

Sep 9, 2016



Janet Lutz of Brookford adjusts her thermostat to her new heating and cooling system from Duke Energy's Helping Home Fund.



Janet Lutz of Brookford has already started covering her new refrigerator from Duke Energy's Helping Home Fund with photos of her grandchildren.

HICKORY – The thermostat at Janet Lutz's house in Hickory has remained at exactly 72 degrees Fahrenheit throughout the summer. While Lutz insisted she is comfortable with the temperature setting in spite of some of the hottest and most humid days during previous summer, it was also due in part to her being overwhelmed by the technology.

"I'm scared to touch the buttons," Lutz said jokingly. "But it feels great around the house. ... My sister also told me to keep the fans in the living room going to keep the air flowing."

Before having the thermostat installed in her house, Lutz had never owned a heating and air conditioning system.

"I've always had my wood stove for over 40 years," Lutz said. "I made my boys go out buy a loaf of wood, stack a pile outside, bring some inside the kitchen and we'd heat it with a stove."

Thanks to the collaborative efforts between Duke Energy and Blue Ridge Community Action (BRCA), Lutz's days of making her grandsons gather wood to generate heat around the house is over.

Lutz was among the families selected by BRCA as one of the recipients of Duke Energy's Helping Home Fund.

Helping Home Fund is a program that offers free assistance for income-qualified Duke Energy customers with up to \$10,000 in energy efficiency upgrades. After receiving a complete home energy assessment, they also receive assistance and counseling to help the families save on their future energy bills.

BRCA's role is to administer the home improvements for the chosen Duke Energy customers as soon as the non-profit organization receives the allocations from Helping Home Funds. They identify the clients who apply for the program, send out contracted auditors to test the home then the auditors send the reports back to BRCA, which then follows up with a select group of clients based on their eligibility scores.

BRCA Energy Director Shawna Hanes said the program operates in a team effort with all the contracted partners and Duke Energy all playing their own roles.

"We have qualified contractual partners that we had carefully selected which we are glad to have with us," Hanes said. "And we would not have been able to install the system (in Lutz's home) if it weren't for the funding received by Duke Energy."

In addition to assessment and counseling, chosen families like Lutz's receive services from the program such as health and safety repairs and installation of home ventilation systems.

And for Lutz's case, she received repairs on her home windows and a refrigerator as additional services provided by the program.

Lutz said ever since the installations for the series of home improvements were completed several months ago, she had been pleasantly surprised to see her house is a lot more energy efficient, evident by the noticeable difference in her monthly Duke Energy bills.

"When we used the wood around the house, it went around \$200 a month," Lutz said. "Now it's between \$120 to \$140. ... Now I can spend the extra money on the boys' school supplies and (school) uniforms."

Lutz said the new heating system in the house has enabled her to give her two grandsons -- Daniel, 15, and Nick, 11 -- extra time in the evenings by not having to make them go out to gather wood for the stove. But as a result, she did add more chores around the house for the boys.

"They're not going to sit around," Lutz said jokingly. "Daniel likes to cook so I have him prepare the main dishes, and Nick likes to bake pastries and I get him to organize the Bible shelves."

All jokes aside, Lutz said the series of home improvements and installations have helped the family immensely, especially for her two grandsons. They've struggled with asthma when their house was in its previous conditions.

"They're nowhere near as affected by it now," Lutz said. "I couldn't be more thankful for Helping Home Fund."

Hanes said seeing the families experience improvements to not only their home utility systems, but also to the quality of their lives makes her job that much more fulfilling.

"It's always exciting to see all the work get done," Hanes said. "It keeps our staff motivated when they get a chance to see these families smile in-person."

Application Process

Although BRCA is nearing the end of its Duke Energy HHF allocation period, Hanes said she encourage clients to apply for services since they will continue to provide weatherization services to low-income families. Hanes said if a client is unable to come to the BRCA office locations, our organization's service workers could make a home visit when possible.

For more information on the weatherization services, visit their website at <http://www.brcainc.org/weatherization>. The Weatherization Services page provides more information about how weatherization helps low income families save energy and money and also informs clients on how to qualify for weatherization. Applicants must qualify for weatherization in order to qualify for the Duke funds.

Duke Energy's Helping Home Fund aides Lincolnton woman



MATT CHAPMAN

Staff Writer

Duke Energy launched its Helping Home Fund in January of last year and has since provided more than 2,000 families in North Carolina with up to \$10,000 of energy efficiency upgrades at no cost to the customer.

The Helping Home Fund is a \$20 million program funded by Duke Energy shareholders that was authorized through an agreement with the N.C. Public Staff and approved by the N.C. Utilities Commission in 2013. It serves families at or below 200 percent of federal poverty guidelines and helps income-qualified customers with upgrades that include the replacement of outdated washers and dryers, HVAC replacements, insulation and other weatherization benefits.

Duke Energy contracted the N.C. Community Action Association to administer the \$20 million of funding through 28 agencies across the state. In Lincoln County, more than \$58,000 from the Helping Home Fund has been administered through I Care Inc., a private non-profit that works to expand economic security for vulnerable families.

Patrenia Fair is one of the Lincoln County residents who has been helped by this collaboration between Duke Energy and I Care. She spent years living through sweltering summers and harsh winters in a home without a properly functioning heating and cooling system. Fair lacked the

disposable income to make the required fixes and the problems snowballed as the use of space heaters and window air conditioning units drove her energy costs through the roof.

"I thank God for these people who have helped me," Fair said while fighting back tears. "I'm glad that they came by to see about me and cared enough to come check on me."

Fair applied for the program through I Care and as a Duke Energy customer was eligible for assistance through the Helping Home Fund. Work began on her home in April as I Care replaced her electric baseboard heating and installed a brand new heat pump. In addition to the new heating system, Fair's home also received weatherization upgrades and the fund provided her with a new, energy efficient refrigerator to help save additional money each month.

"I've been in this job for almost seven years and I'll never forget the first home I went into," Rick Stotts of I Care said. "It was a mobile home and it was in the winter time and it was freezing cold in there. I saw this young girl laying on the sofa with a bunch of blankets over her and I didn't realize it right away, but she had a little baby under there trying to keep it warm. I have a real soft spot for older folks and kids. They're so appreciative for what you do for them and you can see the difference it makes in their lives."

The Helping Home Fund is a one-time program, meaning that once the \$20 million has been spent the program is over. However, Duke Energy representatives are working on putting a similar initiative together sometime in the near future

"We are a very large company, but we want to try to reach out to everybody and have a conversation," Duke Energy program manager Casey Fields said. "If it means that we can make a big enough change in someone's life that you get emotional or you feel good about it, it makes my job much, much better at the end of the day. This is a phenomenal program and this is the right thing that we're doing and it's what we should be doing."

Image courtesy of Matt Chapman

The customer was in need of energy saving measures for his mobile home. He is disabled and has limited income, which made it difficult to get much needed measures done to his home. [REDACTED] was grateful for all the assistance that Action Pathways along with Duke Energy's Helping Homes Funding provided to his home. [REDACTED] was very pleased with all the services he received by from weatherization program and has already seen a change in the way his home feels.

[REDACTED]'s Home



Old System

New Energy Efficient System



No Vapor Barrier



Vapor Barrier



Old Bath Fan



New Bath Fan

Since the start of the Duke Helping Homes program we have helped over 125 families in Macon County addressing health and safety issues and installing energy efficient appliances and heating systems to reduce their energy usage and monthly bills.

The health and safety part of the program enabled us to install handicap ramps, grab bars and do much needed porch repairs so that our clients could stay in their homes. Also we were able to install new heating and air conditioning systems where they were non-existent or beyond repair. This was so very important to our clients on oxygen and with health issues.

██████████ is one of our clients with health issues and cannot endure extreme cold or heat. She is very comfortable in her home now with her new heating and air system and does not have to go stay with relatives as she did in the past.

██████████ is a client who is on oxygen and installing a new heating and air system to his home eliminated the wood burning stove. He could no longer lift the logs and a dangerous situation was eliminated.

██████████ was in a nursing home and could not return home until a handicap ramp was installed. She is now able to be in her own home.

██████████ was in desperate need of a handicap ramp and since his wife is on oxygen, we were able to replace the propane system with a heat pump and install the handicap ramp.

██████████ was in need of porch repairs and a handicap ramp. He is now able to enter and exit his home safely and can stay there for many more years.

██████████ **and his wife** are both disabled and have a young child. They are truly grateful for the handicap ramp and heating and air system.

██████████ lives alone in a very rural area and was in need of a handicap ramp. She was in a nursing home and couldn't return home. We were able to install the needed ramp and also install a mini split heating system for her. She is now able to be at home.

So many of our clients have commented about how their lives have been changed for the good and how happy they are to see the reduction in their energy bills due to the appliance replacement program and HVAC replacement program.

Macon County Housing Department was able to use the monies from the Helping Home Fund in conjunction with other programs such as the Urgent Repair Program, HARRP, Single Family Rehab Program and the Weatherization Program.

We wish the program would be continued as there are many elderly, disabled and single parent families here who would benefit from being able to switch from wood burning stoves and the expensive propane heating to the energy efficient heat pumps.

Various Success Stories from Duke Energy's Helping Home Fund

[REDACTED]
Wilmington, NC

To Duke Energy Helping Home Fund:

How will I ever be able to thank you for kindness & generosity in helping us to get a new HVAC system put in. After living over a decade without heat and air, it had pretty much become a way of life for us to live in one room during cold and hot days. Using an electric heater to stay warm was neither safe or efficient. As students (trying to improve our lives) we would sit and do homework with hat, coat, & gloves on. For us, it was a normal way of life for many years. However, thanks to your Home fund and giving back to the community, Wilmington Area Rebuilding Ministry, Inc. was able to see to it that we were matched with you to be a recipient of your gift. It has changed our life overnight to have this new system in place. Thank you again and WARM for your kindness & especially for the volunteers at WARM for treating us with dignity & respect.

[REDACTED]
Durham, NC

[Received Air Sealing and Mechanical Ventilation]

This letter is to thank you for the amazing and wonderful maintenance work that was done to bring my home up to standard. I would never have been able to pay or save for the service that Your Company did for me. The company is a God Sent for Seniors.

I would like to thank the people (men) who performed the service, they were [REDACTED], the Auditor, [REDACTED], and the other two men from Charlotte, NC who did the electric work. They were very polite, friendly and respectable to me and my home. After the work was completed they checked to see if everything was working or performing correctly.

Again, Thank all of You.

[REDACTED] [HVAC Replacement]

To whom it may concern. We just wanted to thank you for all you did for us. We could not have afforded this ourselves. It's good to know that in this messed up world we live in today, there is still people with goodness in them. I believe God will bless and prosper your company for what you do. We appreciated all your crews that came out. God bless you and good luck in the future.

[REDACTED]
Willow Spring, NC
[HVAC Replacement – Mechanical Ventilation]

Thank you for the weatherization of our home. The things did have definitely made a difference in our electric bill. We are so appreciative for the services that you provided because they were needed so badly and we could not afford to have any of the work done.

The gentlemen from your organization and the service providers from Therma Direct, Carolina Weatherization, and Lowe's were so respectful and extremely courteous.

[Redacted]
[Plumbing repairs & HVAC Repairs]

Wanted to say thank you so very much for help in facilitating all the repairs on my home. Already seeing a difference in energy bills. I have nothing but good things to say about your agency. Hope you all keep up the great work.

[Redacted]
Zebulon, NC
[HVAC Replacement]

My deepest appreciation to all administrators of Wake County Weatherization and Duke Energy Progress Heat/AC Assistance Programs. Because of your programs, I was blessed to get my Heat and AC needs met for only 25% of the total cost which was paid by my landlady.

[Redacted]
Henderson, NC

I would like to express my appreciation for this program. It has really helped me a lot. I would not have been able to have this work done without your help. My house has never been better.

The works were very professional and kept me informed on what was going on. They had to rework the duct work, install insulation, replaced attic steps, replaced roofing (ceiling tiles) and installation of the unit. There "wore" the best. Without this program, a lot of families would be without heat or air and a comfortable place to live.

[Redacted]
Just wanted to thank you and let you know how much I appreciate all that you all have done for me. The heating and cooling unit works great, and the washer and dryer are great, makes doing laundry a pleasure. All who came to my house to install everything, were so very very nice. I have never had that many new things that I didn't have to make monthly payments on. What a blessing.

Homeowner serviced by Coastal Community Action in New Port, NC

[Redacted] [Executive Director of Coastal Community Action] called this morning after receiving a call from a lady who had been helped through the Helping Home Fund. This lady was a retired teacher who because of sickness was no longer able to work. She had replaced the roof on her home before her funds ran out. She has been without heat for a very long time. The actual work will not be completed until tomorrow, but the lady was so overwhelmed with the kindness shown to her that she called [Redacted] and talked for over an hour. She said that she had never been treated as kind and was so appreciative of the professional staff at Coastal.

[Redacted]
Mount Airy, NC

Dear [Redacted] /Weatherization and Duke Power,

Just a note to say THANK YOU, so much, All of you, for my new A/C unit and the free installation of same. I've worked hard all my life and it is so much appreciated. To find people willing to help me so much in my older, non-working time and age. And what a year to get such a blessing – So hot!

[REDACTED]
Fuquay Varina, NC

I just had to thank you and your company for caring about our community and seniors. I have been so afraid of falling "again" in the winter with 2 inches of ice on my stairs, not even able to get out of my home. Through the money you gave to Senior Weatherization I am now much safer going in and out of my home. I am more than grateful for your helping me! I will be praying for God's blessings to overtake you and your company and your family.

You truly have been used by God to answer my prayers to keep me safe Thank you one million times

[REDACTED]
Charlotte, NC

I wanted to take this time to thank you for your service in making sure I have received my new GE Appliances, what a difference it has made in my home. Having appliances that are not only brand new, but are updated and just simply beautiful.

Thank you for your Help and the Change it has made in my life.

[REDACTED]
Raleigh/Durham

Season Greetings,

I did not want another day to go pass without me giving you all this big appreciative love email!! I am speechless and so grateful for all the work that was done to my home! I came to you with lots of concerns and not to mention a \$1200.00 light bills for two months. My family barely made it through the year because there was only money for the basics but God!!! There was no way I could have ever afford to do any of the work you all did! I am less stressed because my power bill has been cut down tremendously, we all sleep safe at night because you have installed smoke detectors and carbon monoxide detectors, I won't have animals crawling in the crawl space and it was fully insulated as well, and although it's not the last thing you all did but you all got rid of my 1980s refrigerator and blessed us with a new one. I am emotional right now just writing this email! If I ever was wavering in my faith, I am reminded every time I opened the front door and step inside my warm and cozy home 2 things-God has angels on earth and He is still performing miracles.

[REDACTED]
Boonville, NC

From the agency that served [REDACTED]

I had a delightful telephone call from [REDACTED] and wat to shar it. [REDACTED] is an elderly lady. She's an expressive person and has a jolly attitude and outlook about most things.

She called me to let me know Lowe's delivered her new refrigerator at 8:08am Tuesday morning. She said she "had no idea it would be so big and so pretty and so nice! That's a rich lady's refrigerator! I have never had a refrigerator I didn't have to buy on credit, make payments on, and do without, in order to get it. I'll be 83 next Wednesday and I think this is my birthday present from heaven! I don't know if other people call you to thank you for their refrigerators and let you know how nice they are, but I had to. I want to thank each one of you that had anything to do with helping me get my new refrigerator and heat pump. My house is nice and warm now!"

Success Story from Charlotte Area Fund

Good Afternoon [REDACTED],

I really did not know what I was going to do! For almost 5 years, my washing machine had been leaking, it took more than 2 hours for 1 load of clothes to dry, my refrigerator made a "humming" noise, and my oven door was broken.... the whole house was falling apart and honestly so was I!

I was barely making enough money to survive and just the thought of trying to replace worn out broken appliances was almost too much to bare. And then.... I read the article in the *Charlotte Area Fund Spring 2016 Newsletter* about the Charlotte Area Fund and Duke Energy Replacement Appliance Assistance Program and like an **angel** you helped a struggling resident obtain new appliances!

[REDACTED], you made the process so easy, you completed the paperwork quickly, and you were very professional. The contractor and the delivery personnel you sent to my home were extremely professional, courteous and completed the job in a timely manner. I thank the Good Lord for this program. I can now cook in a new modern oven, wash my clothes in an energy efficient washer and it only takes about **15 minutes for a load to dry!!!** I am so overjoyed at receiving these appliances words can hardly express my joy and gratitude!!

Thank you so much [REDACTED], the Charlotte Area Fund, and Duke Energy for this awesome program.

God Bless you once again.

POSTED ON [SEPTEMBER 7, 2016](#) BY [STOKES NEWS](#)

Couple benefit from Duke Energy's Helping Home Fund

By Amanda Dodson - adodson@civitasmedia.com



Anthony and Lydia Prysock, a retired couple living in the Walnut Tree community, were the recipients of home upgrades through Duke Energy's Helping Home Fund.

Anthony and Lydia Prysock, a retired couple living in the Walnut Tree community, were the recipients of a new high efficiency heating and cooling heat pump, a washer and dryer, and safety measure upgrades to their home through the Helping Home Fund. The two-year initiative, launched in January of 2015 by Duke Energy, reduces the burden of energy costs and electricity for families in North Carolina. The \$20 million community investment pays up to \$10,000 per household for repairs, new appliances, retrofitting for efficiency, and other electricity costs based on household income.

Last winter, the Prysock's were paying nearly \$400 a month using baseboard heating, a grueling amount for the couple who are on a fixed income. While they've slowly completed home renovations over the years, there was a mounting list of more to do.

"I noticed one of my neighbors down the street was having a heat pump put in and I asked the contractor to write up an estimate of how much it would cost at our house," Prysock said. "But as I was talking to the young lady, she told me about this program and I gave them a call."

After doing some research, Prysock realized he and his wife were eligible for Duke Energy's Helping Home Fund, and the program would easily cut his power bill in half.

"We applied and went through the process. I'm really thankful for this and for Duke Energy giving to our area. This is how you rebuild communities. What little money we did have we redid the cabinets and put on a new roof. It would have been a long time before we could have done anything like this."

The Helping Home Fund has invested over \$175,000 in Stokes County and helped 55 families receive energy-saving upgrades at no charge to income-qualified customers.

"The Prysock's are one of more than 2,000 families we've helped all over North Carolina. We've spent almost \$10 million dollars and we still have about another \$10 million," explained Lisa Parrish, Duke Energy's Government and Community Relations Manager. "We have great organizations we work with like YVEDDI that just know how to get it done."

Tommy Eads, the weatherization director from YVEDDI, said the program has been flooded with applicants and said when considering homes, they look at household size, yearly kilowatts usage, and income.

"We've done several houses on this street and some others close by. There's 334 projects that we have either started or completed in homes from Stokes, Surry, Yadkin and Davie. We service all four counties with the state and the Duke Energy program," Eads said. "It's great to be able to help the community. I feel like we get to be a part of making a difference one homeowner at a time."

Amanda Dodson can be reached at 336-813-2426 or on Twitter at AmandaTDodson.

June 12, 2015

Governor Pat McCrory
Office of the Governor
20301 Mail Service Center
Raleigh, NC 27699-0301

Dear Governor McCrory,

My heating and air conditioner quit working in January. I purchased some little heaters that kept me warm. I was employed for many years and was a single parent of two children. Unfortunately, I had to retire sooner than expected and being independent made that a hard transition. I called several companies for estimates and realized faith was my only solution. My daughter contacted an agency by the name of Coastal Community Action Inc, specifically its Weatherization Assistance Program and the Heating and Air Repair and Replacement Program. It was an answer to prayer! I called and spoke with [REDACTED] at Coastal Community, and she had me send in the necessary paper work to see if I qualified. She was very kind and helpful. My daughter had originally spoke with her boss, [REDACTED] and he talked with me and was very helpful, explaining the process that would take place. Next [REDACTED] the auditor, came to my house to inspect my whole house to see what could be done to weatherize my home. He was very precise checking throughout my home, and he explained how different things would be beneficial. I called and talked with [REDACTED] who is in charge of the whole program. She told me something that really stuck in my heart. She had presented a three hour presentation to get the funds and grants to help people. I had much gratitude that she had accomplished receiving the grants that would be a gift to so many people. I have never received such help so I am very appreciative. Then they sent the crew out to weatherize my home and to put in an exhaust fan, to wrap my hot water heater, to put a new shower head on, and carbon monoxide detection. They also put insulation around the duct work. These guys were very mannered and it was obvious there was great team work. These guys were [REDACTED] [REDACTED] [REDACTED] [REDACTED] came to inspect their final job. These guys were awesome!

Coastal Community Action Inc. used an electrician, [REDACTED] with For A Electric and he was a super gentleman. They selected McLeans Heating and A/C, owner [REDACTED], whose workers were [REDACTED] and [REDACTED]. They installed a new unit and duct work. I was very pleased with their work and kindness.

I wanted to express my gratitude and share the great blessing I received and felt you should be aware of this wonderful organization and the gracious grants offered by Coastal Community Action! I would be so happy if you could acknowledge my appreciation to each one that has made my life more comfortable and efficient. I want to thank Duke Energy for their assistance and the other donors at Coastal Community Action who made the grants possible.

Sincerely,

[REDACTED]

.cc Coastal Community Action, CEO Lynn Good (Duke Energy)

April 28, 2016

Blue Ridge Community Action Inc.
601 East Fifth Street Ste. 255
Charlotte NC 28202

To Whom It May Concern,

My name is [REDACTED]. I have been a life long resident of the Stanly County area. During this time I made choices in my life that did not reflected a thoughtful planned out success for my future. So I struggled financially. Unfortunately, I never qualified to receive any of the grant money that was allotted to Stanly County to help those who were in need of assistance.

During my life in Stanly County I was blessed to have a son with disabilities which required total care. This job was the love and joy of my life for twenty years. Within that time I was attending school to get a degree which would increase pay, so I can better provide for my children. I had to drop out of school and had to let go many jobs because of my responsibility at home. He passed in 2009, and life itself was a struggle. At one point of my I had no hope nor did it even matter whether I got it together or not. One day, God, just gave me a want- to- live spirit again. So I found jobs that lasted short term and applied for assistance many times. This was very embarrassing and degrading because the people made you feel you just wanted a hand-out. The workers made you feel like scum. After being rejected many times, you have a fear of even seeking help. When it was cold I would put cover up to block off rooms so we would stay in one area of the house, using a space heater. When it was too hot, we would visit someone or mess around in stores until it cool off to go home. I heard about you through a friend at the Community Action in Albemarle. At my wits end I fearfully applied at the Blue Ridge Community Action.

My vocabulary does not even extend far enough to express what my heart truly feels for the blessing you gave my daughter and I. For two years we have been without heat and air. As a single parent making minimum wage and not forty hours a week, I had to prioritize which bills got paid and I just couldn't seem to fit this in my budget during that time. Through Gods power we survived.

I truly thank God for this program, and especially to one of your workers [REDACTED]. The compassionate spirit and concern was of one I have never experienced. Never once did I feel as though I was being seconded guessed about any information, nor made me feel inferior concerning my needs. Out of all the rejections and mistreatments were worth the reward of compassion we received.

Our hats off to you guys and our hands up to God for his mighty acts he showed through you as workers. Continue to show his love and he will continue to bless this business and each one individually for what you do for others.

Thanks,

[REDACTED]

Team effort helps keep man in home

Tim Reaves
reporter@thefranklinpress.com

Kenneth Cruse stood proud on his porch on West Old Murphy Road on Thursday.

"You don't know how much I appreciate it, folks," he said to a group of people from the county who helped him stay in his home.

Cruse, 64, is the beneficiary of a number of emergency repairs, weatherization and energy efficiency upgrades to his 86-year-old home. Over the last two years, he's seen his house repainted, his roof replaced, electrical service upgraded and the installation of an HVAC system, water heater, oven and insulation.

Cruse said the equipment upgrades and weatherization improvements have cut his power bill in half.

"It's quieter, it's warmer, I enjoy it now," he said. "I don't have to sit around in a sweat suit."

Duke Energy contributed about \$10,000 from its \$20 million statewide Helping Home Fund for a new stove, the rails on the porch and various weatherization upgrades, said Lisa Parrish, government and commu-

nity relations manager for the company. Other funding came from the North Carolina Housing Finance Agency. World Changers did much of the housework on Cruse's home, including the new porch.

"This is probably one of the best examples of a public-private partnership," said John Fay, housing director for Macon County Housing Department (MCHD). "It's really a melding of funds and effort by many different organizations. ... It was really great, because we got to do so much here."

Cruse is the third generation of his family to own the house, and he's lived there for 32 years. But propane expenses and electrical inefficiencies were pushing him to the breaking point.

"The way the house was set up before the intervention, there was no way," he said. "It's the only way I could've stayed in it."

Cruse, who lives on Social Security Disability and Supplemental Security Income, said he had no insulation in his home and an old gas furnace that seemed ready to catch on fire.

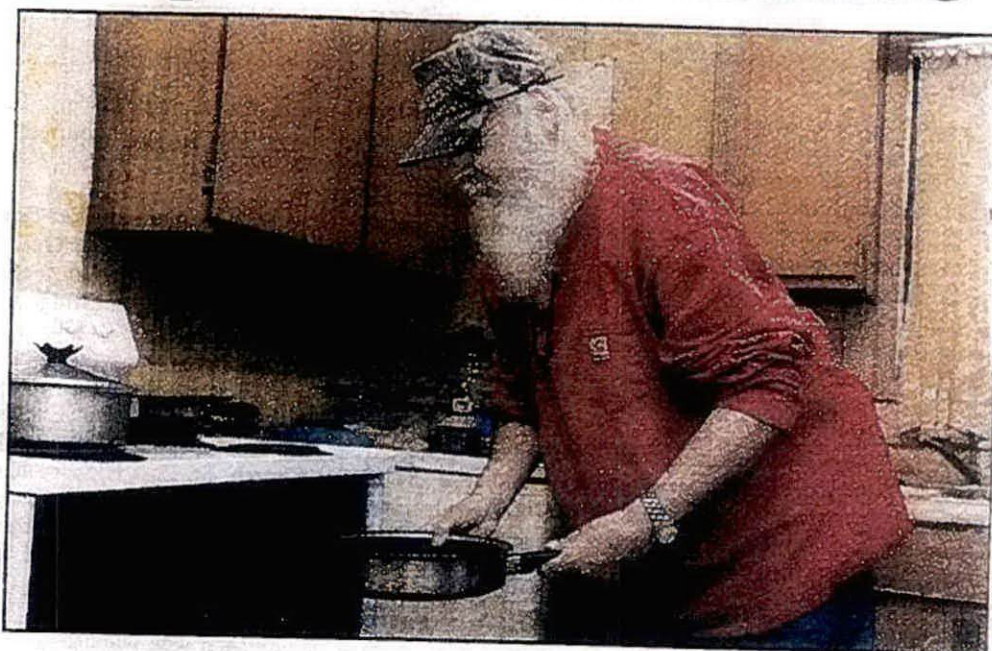
"Over the years, things

happened, things just deteriorated," he said.

He said a friend of his let him know about MCHD, so he filled out an application to see if he qualified for any of the funding. It's typical of most MCHD clients, Fay said. They usually hear about the agency and its programs from friends and family members or local medical or senior services. Then they come to the MCHD office on Old Murphy Road and fill out an application. Staff members look at a number of factors, including income level and problem severity to prioritize the work. MCHD has 250 homes that need some kind of repairs or weatherization upgrades.

"We make that determination and match the work with the capabilities," Fay said. "And sometimes we don't have those. Sometimes we end up having to use, for instance, Habitat for Humanity, Macon Baptist Association, various people in the community that are volunteers."

The work on Cruse's home represents a broader philosophy that places value on letting seniors age in place, Fay said.



Kenneth Cruse pulls a pan out of an oven, which he received as part of Duke Energy's Helping Home Fund.

Press photo/Tim Reaves

"It's important for people to be able to be around the things that they have comfort with and to be able to feel at home and not have to worry about it falling in on them," he said.

MCHD is located at 1419 Old Murphy Road, Franklin. Housing help is available for those who qualify. For more information, call 828-369-2605.

Norlina, NC - Warren County

To whom this may concern,

I wanted to send this letter of appreciation to Franklin Vance Warren and all of the companies that contributed to helping us make our home energy efficient, as well as, safe and livable. For the 2 years that we have had our home, it did not have a heating source. We used kerosene to stay warm in the winter and it was awful. My four children and myself developed asthma and breathing issues that we never had prior to using kerosene. The smell of the kerosene was so strong sometimes that it made our eyes water. We couldn't afford to do anything else besides the kerosene at that time. We finally invested in propane as our heating source, but it didn't heat up the whole house, so we used electric heaters as well. I am so thankful and grateful for the FVW programs because with their help, we were able to qualify for a program that installed central heating and air in our home and a gas pump that has now been such a blessing. With all of the work that the electricians and heating and cooling guys did, we would've never been able to afford such quality work and installation of this system. Not only did they help us in regards to our new heating source, but they also installed more insulation, installed a carbon monoxide detector, installed new shower heads, fixed holes in our walls, sheet rocked around our windows all in effort to help save us from wasting money by making our home energy efficient. They did so much and worked hard to make sure it was done correctly and with love. I can't imagine how my children and I, health would be today, if FVW hadn't been there for us. The most frustrating thing as a parent, is to watch your kids get sick while trying to protect them from freezing to death. It was like torture, to know that you had to do what you had to do to keep us all warm, while sacrificing our extended health in the process. I had to give my children breathing treatments daily, they suffered from headaches, nausea, and low energy and I believe it was from that kerosene. But now, they don't complain about headaches, they haven't had any breathing treatments since, and they are full of healthy energy. We are all happier and warm throughout the entire house. I now have peace of mind and deep gratitude in my heart for the program that I believe saved my families life. Thank you again for all of your help and investments into making our living situation better. Miracles&Blessings.

With Love,

[REDACTED]

I/A

Maness Exhibit I
Schedule 1

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164

CALCULATION OF PUBLIC STAFF RECOMMENDED BILLING FACTORS

Line No.	Item	N.C. Retail Amount (a)	1/
1	Residential Billing Factors		
2			
3	Residential Billing Factor for Rider 10 True-up (EMF) Components		
4			
5	Year 2014 EE/DSM True-Up (EMF) Revenue Requirement	\$ 501,324	
6	Year 2015 EE/DSM True-Up (EMF) Revenue Requirement	(1,014,271)	
7	Year 2016 EE/DSM True-Up (EMF) Revenue Requirement	(2,560,305)	
8	Year 2017 EE/DSM True-Up (EMF) Revenue Requirement	26,865,491	
9	Total True-up (EMF) Revenue Requirement	23,792,240	
10	Projected NC Residential Sales (kWh) for rate period	21,806,637,265	
11	EE/DSM Revenue Requirement EMF Residential Rider EE (cents per kWh)	0.1091	
12			
13	Residential Billing Factor for Rider 10 Prospective Components		
14			
15	Vintage 2017 Total EE/DSM Prospective Amounts Revenue Requirement	\$ 8,904,587	
16	Vintage 2018 Total EE/DSM Prospective Amounts Revenue Requirement	6,294,025	
17	Vintage 2019 Total EE/DSM Prospective Amounts Revenue Requirement	73,958,064	2/
18	Total Prospective Revenue Requirement	89,156,676	
19	Projected NC Residential Sales (kWh) for rate period	21,806,637,265	
20	EE/DSM Revenue Requirement Prospective Residential Rider EE (cents per kWh)	0.4089	
21			
22	<u>Total Revenue Requirements in Rider 10 from Residential Customers</u>		
23			
24	Total True-up (EMF) Revenue Requirement	\$ 23,792,240	
25	Total Prospective Revenue Requirement	\$ 89,156,676	
26	Total EE/DSM Revenue Requirement for Residential Rider EE	\$ 112,948,915	
27	Total EE/DSM Revenue Requirement for Residential Rider EE (cents per kWh)	0.5180	
28			
29			
30	Non-Residential Billing Factors for Rider 10 True-up (EMF) Components		
31			
32	Vintage Year 2014 EE True-up (EMF) Revenue Requirement	\$ (1,154,814)	
33	Projected Year 2014 EE Participants NC Non-Residential Sales (kwh) for rate period	18,883,365,623	3/
34	EE Revenue Requirement Year 2014 EMF Non-Residential Rider EE (cents per kWh)	(0.0061)	
35			
36	Vintage Year 2014 DSM True-up (EMF) Revenue Requirement	\$ (39,246)	
37	Projected Year 2014 DSM Participants NC Non-Residential Sales (kwh) for rate period	18,694,210,397	3/
38	DSM Revenue Requirement Year 2014 EMF Non-Residential Rider EE (cents per kWh)	(0.0002)	

39					
40	Vintage Year 2015 EE True-up (EMF) Revenue Requirement	\$	456,319		Maness Exhibit I
41	Projected Year 2015 EE Participants NC Non-Residential Sales (kwh) for rate period		18,763,045,012	3/	Schedule 1
42	EE Revenue Requirement Year 2015 EMF Non-Residential Rider EE (cents per kWh)		<u>0.0024</u>		
43					
44	Vintage Year 2015 DSM True-up (EMF) Revenue Requirement	\$	(451,445)		
45	Projected Year 2015 DSM Participants NC Non-Residential Sales (kwh) for rate period		18,490,935,207	3/	
46	DSM Revenue Requirement Year 2015 EMF Non-Residential Rider EE (cents per kWh)		<u>(0.0024)</u>		
47					
48	Vintage Year 2016 EE True-up (EMF) Revenue Requirement	\$	(2,329,721)		
49	Projected Year 2016 EE Participants NC Non-Residential Sales (kwh) for rate period		18,489,604,035	3/	
50	EE Revenue Requirement Year 2016 EMF Non-Residential Rider EE (cents per kWh)		<u>(0.0126)</u>		
51					
52	Vintage Year 2016 DSM True-up (EMF) Revenue Requirement	\$	(267,721)		
53	Projected Year 2016 DSM Participants NC Non-Residential Sales (kwh) for rate period		18,210,209,070	3/	
54	DSM Revenue Requirement Year 2016 EMF Non-Residential Rider EE (cents per kWh)		<u>(0.0015)</u>		
55					
56	Vintage Year 2017 EE True-up (EMF) Revenue Requirement	\$	53,163,097		
57	Projected Year 2017 EE Participants NC Non-Residential Sales (kwh) for rate period		18,183,662,735	3/	
58	EE Revenue Requirement Year 2017 EMF Non-Residential Rider EE (cents per kWh)		<u>0.2924</u>		
59					
60	Vintage Year 2017 DSM True-up (EMF) Revenue Requirement	\$	86,311		
61	Projected Year 2017 DSM Participants NC Non-Residential Sales (kwh) for rate period		18,177,460,568	3/	
62	DSM Revenue Requirement Year 2017 EMF Non-Residential Rider EE (cents per kWh)		<u>0.0005</u>		
63					
64	Non-Residential Billing Factors for Rider 10 Prospective Components				
65					
66	Vintage Year 2017 EE Prospective Amounts Revenue Requirement	\$	14,570,381		
67	Projected Program Year 2017 EE Participants NC Non-Residential Sales (kwh) for rate period		18,183,662,735	3/	
68	EE Revenue Requirement Vintage 2017 Prospective Component for Non-Residential Rider EE (cents per kWh)		<u>0.0801</u>		
69					
70	Vintage Year 2018 EE Prospective Amounts Revenue Requirement	\$	12,285,044		
71	Projected Vintage 2018 EE Participants NC Non-Residential Sales (kwh) for rate period		17,670,299,445	3/	
72	EE Revenue Requirement Vintage 2018 Prospective Component for Non-Residential Rider EE (cents per kWh)		<u>0.0695</u>		
73					
74	Vintage Year 2018 DSM Prospective Amounts Revenue Requirement	\$	534,763		
75	Projected Vintage 2018 DSM Participants NC Non-Residential Sales (kwh) for rate period		18,078,506,705	3/	
76	DSM Revenue Requirement Vintage 2018 Prospective Component for Non-Residential Rider EE (cents per kWh)		<u>0.0030</u>		
77					
78	Vintage Year 2019 EE Prospective Amounts Revenue Requirement	\$	54,780,288	2/	
79	Projected Vintage 2019 EE Participants NC Non-Residential Sales (kwh) for rate period		17,670,299,445	3/	
80	EE Revenue Requirement Vintage 2019 Prospective Component for Non-Residential Rider EE (cents per kWh)		<u>0.3100</u>		
81					
82	Vintage Year 2019 DSM Prospective Amounts Revenue Requirement	\$	13,300,208	2/	
83	Projected Vintage 2019 DSM Participants NC Non-Residential Sales (kwh) for rate period		18,078,506,705	3/	
84	DSM Revenue Requirement Vintage 2019 Prospective Component for Non-Residential Rider EE (cents per kWh)		<u>0.0736</u>		

1/ Miller Exhibit 1, Pages 1 and 2, unless otherwise noted.

2/ Maness Exhibit II, Schedule 2

3/ Maness Exhibit II, Schedule 4.

Maness Exhibit I
Schedule 2

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164

CALCULATION OF PUBLIC STAFF RECOMMENDED VINTAGE 2019 REVENUE REQUIREMENT

Line No.	Item	N.C. Retail Amount (a)	1/
1	RESIDENTIAL		
2			
3	Residential EE Program Cost	\$ 41,002,874	2/
4	Residential EE Earned Utility Incentive	2,890,230	2/
5	Total EE Program Cost and Incentive Components	43,893,104	
6	Residential DSM Program Cost	10,577,352	2/
7	Residential DSM Earned Utility Incentive	627,157	2/
8	Total DSM Program Cost and Incentive Components	11,204,509	
9	Total EE/DSM Program Cost and Incentive Components	55,097,613	
10	Revenue-related taxes and regulatory fees factor	1.001402	
11	Total EE/DSM Program Cost and Incentive Revenue Requirement	55,174,860	
12	Residential Net Lost Revenues	18,783,204	
13	Total Residential EE Revenue Requirement	\$ 73,958,064	
14			
15			
16	NON-RESIDENTIAL		
17	Energy Efficiency Programs		
18			
19	Non-Residential EE Program Cost	\$ 41,671,831	2/
20	Non-Residential EE Earned Utility Incentive	7,449,143	2/
21	Total EE Program Cost and Incentive Components	49,120,974	
22	Revenue-related taxes and regulatory fees factor	1.001402	
23	Total Non-Residential EE Program Cost and Incentive Revenue Requirements	49,189,842	
24	Non-Residential Net Lost Revenues	5,690,446	
25	Total Non-Residential EE Revenue Requirement	\$ 54,780,288	
26			
27			
28	DSM Programs		
29			
30	Non-Residential DSM Program Cost	\$ 12,538,168	2/
31	Non-Residential DSM Earned Utility Incentive	743,419	2/
32	Total Non-Residential DSM Program Cost and Incentive Components	13,281,587	
33	Revenue-related taxes and regulatory fees factor	1.001402	
34	Total Non-Residential DSM Revenue Requirement	\$ 13,300,208	

1/ Miller Exhibit 2, Page 6, unless otherwise noted.

2/ Maness Exhibit 2, Schedule 3.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164

Maness Exhibit I
Schedule 3

CALCULATION OF PUBLIC STAFF RECOMMENDED PPI, REFLECTING ADJUSTED AVOIDED CAPACITY COSTS

Line No.	Item	System NPV of Avoided Cost ^{1/}	System Cost ^{2/}	System Net Savings ^{3/}	System PPI ^{4/}	N.C. Retail Allocation factor ^{2/}	N.C. Retail Costs ^{5/}	N.C. Retail PPI ^{6/}
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	Residential Programs							
2	EE Programs							
3	Appliance Recycling Program	\$ -	\$ -	\$ -	\$ -	0.728087506	\$ -	\$ -
4	Energy Efficiency Education	2,230,499	2,104,087	126,412	14,537	0.728087506	1,531,959	10,584
5	Energy Efficient Appliances and Devices	47,922,097	21,726,700	26,195,397	3,012,471	0.728087506	15,818,939	2,193,342
6	Residential – Smart Saver Energy Efficiency Program	4,197,690	4,802,289	(604,599)	(69,529)	0.728087506	3,496,467	(50,623)
7	Income Qualified Energy Efficiency and Weatherization Assistance	1,364,009	7,905,880	(6,541,871)	N/A	0.728087506	5,756,172	N/A
8	Multi-Family Energy Efficiency	9,052,409	3,382,816	5,669,593	652,003	0.728087506	2,462,986	474,715
9	Energy Assessments	3,956,628	2,987,118	969,510	111,494	0.728087506	2,174,883	81,177
10	Subtotal	68,723,332	42,908,890	25,814,442	3,720,976		31,241,426	2,709,195
11	My Home Energy Report	15,569,104	13,406,971	2,162,133	248,645	0.728087506	9,761,448	181,035
12	Total for Residential Energy Efficiency Programs	\$ 84,292,436	\$ 56,315,861	\$ 27,976,575	\$ 3,969,621		\$ 41,002,874	\$ 2,890,230
13								
14								
15	Total DSM Programs - Residential Allocation	\$ 47,418,134	\$ 31,286,990	\$ 16,131,144	\$ 1,855,082	0.338075104	\$ 10,577,352	\$ 627,157
16								
17								
18								
19								
20								
21	Non-Residential Programs							
22	EE Programs							
23	Non Residential Smart Saver Custom Energy Assessments	\$ 3,252,134	\$ 1,618,240	\$ 1,633,894	\$ 187,898	0.728087506	\$ 1,178,220	\$ 136,806
24	Non Residential Smart Saver Custom	22,344,177	10,095,189	12,248,988	1,408,634	0.728087506	7,350,181	1,025,609
25	Non Residential Smart Saver Energy Efficient Food Service Products	5,094,291	2,010,534	3,083,757	354,632	0.728087506	1,463,844	258,203
26	Non Residential Smart Saver Energy Efficient HVAC Products	10,481,670	5,762,803	4,718,867	542,670	0.728087506	4,195,825	395,111
27	Non Residential Smart Saver Energy Efficient Lighting Products	57,897,864	17,828,618	40,069,246	4,607,963	0.728087506	12,980,794	3,355,000
28	Non Residential Smart Saver Energy Efficient Pumps and Drives Products	2,721,329	1,165,434	1,555,895	178,928	0.728087506	848,538	130,275
29	Non Residential Smart Saver Energy Efficient IT Products	1,759,269	749,325	1,009,944	116,144	0.728087506	545,574	84,563
30	Non Residential Smart Saver Energy Efficient Process Equipment Products	480,654	240,281	240,373	27,643	0.728087506	174,945	20,127
31	Non Residential Smart Saver Performance Incentive	7,913,257	3,162,160	4,751,097	546,376	0.728087506	2,302,329	397,810
32	Small Business Energy Saver	34,256,167	14,602,066	19,654,101	2,260,222	0.728087506	10,631,581	1,645,639
33	Total for Non-Residential Energy Efficiency Programs	\$ 146,200,812	\$ 57,234,649	\$ 88,966,163	\$ 10,231,110		\$ 41,671,831	\$ 7,449,143
34								
35								
36	Total DSM Programs - Non-Residential Allocation	\$ 47,418,134	\$ 31,286,990	\$ 16,131,144	\$ 1,855,082	0.400747013	\$ 12,538,168	\$ 743,419

1/ Provided by the Company at the Public Staff's request.

2/ Evans Exhibit 1, Page 5.

3/ Column (a) - Column (b).

4/ Column (c) x PPI percentage of 11.50%.

5/ Column (b) x Column (e).

6/ Column (d) x Column (e).

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
ADJUSTMENT TO KWH SALES TO CALCULATE BILLING FACTORS

Maness Exhibit I
Schedule 4

Line No.	Item	Total Usage (a)	Opt-Outs Per Company (b)	Public Staff Reduction Factor (c)	Opt-Outs Per Public Staff (d)	Participating Usage Per Public Staff (e)
1	Vintage 2014 Actual Opt Out					
2	EE	34,250,780,653	15,991,066,628	0.9610	15,367,415,030	18,883,365,623
3	DSM	34,250,780,653	16,187,898,289	0.9610	15,556,570,256	18,694,210,397
4						
5	Vintage 2015 Actual Opt Out					
6	EE	34,250,780,653	16,116,270,178	0.9610	15,487,735,641	18,763,045,012
7	DSM	34,250,780,653	16,399,422,941	0.9610	15,759,845,446	18,490,935,207
8						
9	Vintage 2016 Actual Opt Out					
10	EE	34,250,780,653	16,400,808,135	0.9610	15,761,176,618	18,489,604,035
11	DSM	34,250,780,653	16,691,541,710	0.9610	16,040,571,583	18,210,209,070
12						
13	Vintage 2017 Actual Opt Out					
14	EE	34,250,780,653	16,719,165,367	0.9610	16,067,117,918	18,183,662,735
15	DSM	34,250,780,653	16,725,619,235	0.9610	16,073,320,085	18,177,460,568
16						
17	Vintage 2018 Estimated Opt Out					
18	EE	34,250,780,653	17,253,362,339	0.9610	16,580,481,208	17,670,299,445
19	DSM	34,250,780,653	16,828,588,916	0.9610	16,172,273,948	18,078,506,705
20						
21	Vintage 2019 Estimated Opt Out					
22	EE	34,250,780,653	17,253,362,339	0.9610	16,580,481,208	17,670,299,445
23	DSM	34,250,780,653	16,828,588,916	0.9610	16,172,273,948	18,078,506,705

1/ Miller Exhibit 6

2/ 34,250,780,653 kWh [5] divided by 35,641,166,806 kWh [6]

3/ Column (b) x Column (c)

4/ Column (a) - Column (d)

5/ Miller Exhibit 6, Line 2

6/ Miller Exhibit 7, Page 3, Line 2

I/A

**COST RECOVERY AND INCENTIVE MECHANISM FOR DEMAND-SIDE
MANAGEMENT AND ENERGY EFFICIENCY PROGRAMS**

**(Approved in Docket No. E-7, Sub 1032 and Revised in Docket No. E-7, Sub
1130)**

The purpose of this Mechanism is to (1) allow Duke Energy Carolinas, LLC (Duke Energy Carolinas or the Company), to recover all reasonable and prudent costs incurred for adopting and implementing new demand-side management (DSM) and new energy efficiency (EE) measures in accordance with G.S. 62-133.9, Commission Rules R8-68 and R8-69, prior Orders of the Commission, and the additional principles set forth below; (2) establish certain requirements, in addition to those of Commission Rule R8-68, for requests by Duke Energy Carolinas for approval of DSM and EE programs; (3) establish the terms and conditions for the recovery of Net Lost Revenues and a Portfolio Performance Incentive (PPI) to reward Duke Energy Carolinas for adopting and implementing new DSM and EE measures and programs in cases where the Commission deems such recovery and reward appropriate, and (4) provide for an additional incentive to further encourage kilowatt-hour (kWh) savings achievements. The definitions set out in G.S. 62-133.8 and G.S. 62-133.9 and Commission Rules R8-68 and R8-69 apply to this Mechanism. For purposes of this Mechanism, the definitions listed below also apply.

Changes in the terms and conditions of this Mechanism shall be applied prospectively only, to vintage years following any Commission order amending these terms and conditions. Approved programs and measures shall continue to

be subject to the terms and conditions that were in effect when they were approved with respect to the recovery of reasonable and prudent costs and Net Lost Revenues. With respect to the recovery of the PPI, approved programs and measures shall continue to be subject to the terms and conditions in effect in the vintage year that the measurement unit was installed.

Definitions

1. *Common costs* are costs that are not attributable or reasonably assignable or allocable to specific DSM or EE programs but are necessary to design, implement, and operate the programs collectively.
2. *Costs* include program costs (including those of pilot programs approved by the Commission for inclusion in the Mechanism), common costs, and, subject to Rule R8-69(b), any other costs approved by the Commission for inclusion in the Mechanism. *Costs* include only those expenditures appropriately allocable to the North Carolina retail jurisdiction.
3. *Low-Income Programs or Low-Income Measures* are DSM or EE programs or DSM or EE measures approved by the Commission as programs or measures provided specifically to low-income customers.
4. *Measure* means, with respect to EE, an "energy efficiency measure," as defined in G.S. 62-133.8(a)(4), that is new under G.S. 62-133.9(a); and, with respect to DSM, an activity, initiative, or equipment, physical, or

program change, that is new under G.S. 62-133.9(a) and satisfies the definition of "demand-side management" as set forth in G.S. 62-133.8(a)(2).

5. *Measurement unit* means the basic unit that is used to measure and track the (a) incurred costs; (b) Net Lost Revenues; and (c) net kilowatt (kW), kWh, and dollar savings for DSM or EE measures installed in each vintage year. A measurement unit may consist of an individual measure or bundles of measures. Measurement units shall be requested by Duke Energy Carolinas and established by the Commission for each program in the program approval process, and shall be subject to modification by the Commission when appropriate. If measurement units have not been established for a particular program, the measurement units for that program shall be the individual measures, unless the Commission determines otherwise.

6. *Measurement unit's life* means the estimated number of years that equipment or customer treatment associated with a measurement unit will operate if properly maintained or activities associated with the measurement unit will continue to be cost-effective, and produce energy (kWh) or peak demand (kW) savings, unless the Commission determines otherwise.

7. *Net Found Revenues* means any increases in revenues resulting from any activity by Duke Energy Carolinas' public utility operations that causes a customer to increase demand or energy consumption, whether or not that activity has been approved pursuant to Rule R8-68. In determining which activities

constitute Net Found Revenues, the "decision tree" adopted by Order in Docket No. E-7, Sub 831 on February 8, 2011, should be applied.

8. *Net Lost Revenues* means Duke Energy Carolinas' revenue losses, net of marginal costs avoided at the time of the lost kWh sale(s), or in the case of purchased power, in the applicable billing period, incurred by Duke Energy Carolinas' public utility operations as the result of a new DSM or EE measure. This Mechanism provides for recovery by the Company of a reasonable amount of Net Lost Revenues, net of any applicable Net Found Revenues. A PPI shall not be considered in the calculation of Net Lost Revenues or Net Lost Revenue recovery.

9. *Net-to-gross (NTG) factor* means an adjustment factor used to compute the net kW/kWh savings by accounting for but not limited to such behavioral effects as rebound, free ridership, moral hazard, free drivers, and spillover.

10. *Program* means a collection of new DSM or EE measures with similar objectives that have been consolidated for purposes of delivery, administration, and cost recovery, and that have been or will be adopted on or after January 1, 2007, including subsequent changes and modifications.

11. *Program costs* are costs that are attributable to specific DSM or EE programs and include all appropriate capital costs (including cost of capital and depreciation expenses), common costs, reasonably assignable or allocable administrative and general costs, implementation costs, incentive payments to

program participants, operating costs, and evaluation, measurement, and verification (EM&V) costs, net of any grants, tax credits, or other reductions in cost received by the utility from outside parties.

12. *Portfolio Performance Incentive (PPI)* means a utility incentive payment to Duke Energy Carolinas as a bonus or reward for adopting and implementing new (as defined in G.S. 62-133.9(a)) EE or DSM measures based on the sharing of dollar savings achieved by those DSM and EE measures. PPI excludes Net Lost Revenues.

13. *Total Resource Cost (TRC) test* means a cost-effectiveness test that measures the net costs of a DSM or EE program as a resource option based on the total costs of the program, including both the participants' costs and the utility's costs (excluding incentives paid by the utility to or on behalf of participants). The benefits for the TRC test are avoided supply costs, i.e., the reduction in generation capacity costs, transmission and distribution costs, and energy costs caused by a load reduction. The avoided supply costs shall be calculated using net program savings, i.e., savings net of changes in energy use that would have happened in the absence of the program. The costs for the TRC test are the net program costs incurred by the utility and participants, and the increased supply costs for any periods in which load is increased. All costs of equipment, installation, operation and maintenance (O&M), removal (less salvage value), and administration, no matter who pays for them, are included in this test. Any tax credits are considered a reduction to costs in this test.

14. *Utility Cost Test (UCT)* means a cost-effectiveness test that measures the net costs of a DSM or EE program as a resource option based on the costs incurred by the utility (including incentive costs paid by the utility to or on behalf of participants) and excluding any net costs incurred by the participant. The benefits for the UCT are avoided supply costs, i.e., the reduction in generation capacity costs, transmission and distribution costs, and energy costs caused by a load reduction. The avoided supply costs shall be calculated using net program savings, i.e., savings net of changes in energy use that would have happened in the absence of the program. The costs for the UCT are the net program costs incurred by the utility and the increased supply costs for any periods in which load is increased. Utility costs include initial and annual costs, such as the cost of utility equipment, O&M, installation, program administration, incentives paid to participants and participant dropout and removal of equipment (less salvage value).

15. *Vintage year* means an identified 12-month period in which a specific DSM or EE measure is installed for an individual participant or group of participants.

Term

16. This Mechanism shall continue until terminated pursuant to Order of the Commission.

Application for Approval of Programs

17. In evaluating potential DSM/EE measures and programs for selection and implementation, Duke Energy Carolinas will first perform a qualitative measure screening to ensure measures are:

- (a) Commercially available and sufficiently mature.
- (b) Applicable to the Duke Energy Carolinas service area demographics and climate.
- (c) Feasible for a utility DSM/EE program.

18. Duke Energy Carolinas will then further screen EE and DSM measures for cost-effectiveness. For purposes of this screening, estimated incremental EM&V costs attributable to the measures shall be included in the measures' costs. With the exception of measures included in Low-Income Programs or other non-cost-effective programs with similar societal benefits as approved by the Commission, an EE or DSM measure with an estimated TRC test result less than 1.0 will not be considered further, unless the measure can be bundled into an EE or DSM Program to enhance the overall cost-effectiveness of that program.

19. With the exception of Low-Income Programs or other non-cost-effective programs with similar societal benefits as approved by the Commission, all programs submitted for approval will have an estimated TRC and UCT test result greater than 1.00. Additionally, for purposes of calculating cost-effectiveness for program approval, the Company shall use projected avoided

capacity and energy benefits specifically calculated for the program, as derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of the date of the filing for the new program approval. However, for the calculation of the underlying avoided energy credits to be used to derive the program-specific avoided energy benefits, the calculation will be based on the projected EE portfolio hourly shape, rather than the assumed 24x7 100 MW reduction typically used to represent a qualifying facility. For purposes of determining cost-effectiveness, estimated incremental EM&V costs attributable to each program shall be included in program costs. Duke Energy Carolinas will comply, however, with Rule R8-60(i)(6)(iii), which requires that Duke Energy Carolinas' biennial Integrated Resource Plan, revised as applicable in its annual report, include certain information regarding the measures and programs that it evaluated but rejected.

20. If a program fails the economic test in Paragraph 19 above, Duke Energy Carolinas will determine if certain measures can be removed from the program to satisfy the criteria established in Paragraph 19.

21. Nothing in this Mechanism relieves Duke Energy Carolinas from its obligation to comply with Commission Rule R8-68 when filing for approval of DSM or EE measures or programs. As specifically required by Rule R8-68(c)(3)(iii), Duke Energy Carolinas shall, in its filings for approval of measures and programs, describe in detail the industry-accepted methods to be used to

collect and analyze data; measure and analyze program participation; and evaluate, measure, verify, and validate estimated energy and peak demand savings. Duke Energy Carolinas shall provide a schedule for reporting the results of this EM&V process to the Commission. The EM&V process description should describe not only the methodologies used to produce the impact estimates utilized, but also any methodologies the Company considered and rejected. Additionally, if Duke Energy Carolinas plans to use an independent third party for purposes of EM&V, it shall identify the third party and include all third-party costs in its filing.

22. For those programs first approved in Duke Energy Carolinas' South Carolina jurisdiction and subsequently in its North Carolina jurisdiction, net dollar savings achieved in the South Carolina jurisdiction will be eligible for consideration of inclusion in the determination of the incentive to be approved by the Commission.

Program Management

23. In each annual DSM/EE cost recovery filing, Duke Energy Carolinas shall (a) perform prospective cost-effective test evaluations for each of its approved DSM and EE programs, (b) perform prospective aggregated portfolio-level cost-effectiveness test evaluations for its approved DSM/EE programs (including any common costs not reasonably assignable or allocable to individual programs), and (c) include these prospective cost-effectiveness test results in its DSM/EE rider application.

23A. For purposes of calculating prospective cost-effectiveness in each DSM/EE rider proceeding to be used to determine whether a program should remain in the portfolio, the Company shall assess each program by:

- a. Using projected avoided capacity and energy benefits specifically calculated for each program, as derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing. However, for the calculation of the underlying avoided energy credits to be used to derive the program-specific avoided energy benefits, the calculation will be based on the projected EE portfolio hourly shape, rather than the assumed 24x7 100 MW reduction typically used to represent a qualifying facility; and,
- b. Evaluating each cost-effectiveness test using projections of participation, savings, costs, and benefits for the upcoming vintage year.

23B. The parties acknowledge that prospective cost-effectiveness evaluations are snapshots of the program's performance, and that ongoing cost-effectiveness is impacted by many factors outside the Company's control,

including but not limited to market and economic conditions, avoided costs, and government mandates. The parties shall continue to work to maintain the cost-effectiveness of its portfolio and individual programs. However, for any program that initially demonstrates a TRC, determined pursuant to paragraph 23A above of less than 1.00, the Company shall include a discussion in its annual DSM/EE rider proceeding of the actions being taken to maintain or improve cost-effectiveness, or alternatively, its plans to terminate the program.

23C. For programs that demonstrate a prospective TRC, determined pursuant to paragraph 23A above, of less than 1.00 in a second DSM/EE rider proceeding, the Company shall include a discussion of what actions it [sic] has taken to improve cost-effectiveness. Fluctuations of TRC above and below 1.0 should be addressed on a case by case basis.

23D. For programs that demonstrate a prospective TRC, determined pursuant to paragraph 23A above, of less than 1.00 in a third DSM/EE rider proceeding, the Company shall terminate the program effective at the end of the year following the DSM/EE rider order, unless otherwise ordered by the Commission.

24. The Company will seek to leverage available state and federal funds to operate effective efficiency programs. Its application for such funds will be transparent with respect to the cost, operation, and profitability of programs operated with those funds in a manner consistent with its authorized revenue recovery mechanism. Use of such funds helps offset the participant's project

costs and is supplemental to Duke Energy Carolina's incentives to participants. As such, these funds will not change the impacts or cost-effectiveness of Duke Energy Carolinas' programs as calculated using the UCT. Further, the amount of avoided costs recognized by the Company will not be reduced if participants also use state or federal funds to offset any portion of their project costs.

Program Modifications

25. Modifications to Commission-approved DSM/EE programs will be made using the Flexibility Guidelines filed on February 6, 2012, in Docket No. E-7, Sub 831, and approved July 16, 2012, by the Commission.

26. If under the Flexibility Guidelines Commission approval of a modification is required, the Company shall file a petition prior to the implementation of the program change no later than 30 days prior to the proposed effective date, pursuant to Commission Rule R8-68.

27. If under the Flexibility Guidelines advance notice is required, Duke Energy Carolinas shall file all program changes no later than 45 days prior to the proposed effective date of the change using the Advance Notice Program Modifications Reporting Template (Template). If any party has concern about the proposed program modification, it shall file comments with the Commission within 25 days of the Company's filing.

28. The Company shall file on a quarterly basis using the Template a notification of all program changes that have been made without Commission preapproval or advance notice.

29. Whenever a change in a program or measure goes into effect, the baseline cost effectiveness test results should be reset for the purposes of applying the Flexibility Guidelines to subsequent modifications.

Evaluation, Measurement and Verification

30. EM&V of programs, conducted by an independent third-party using a nationally-recognized protocol, will be performed to ensure that programs remain cost-effective. This protocol may be modified with approval of the Commission to reflect the evolution of best practices.

31. EM&V will also include updates of any net-to-gross (NTG) factors related to previous NTG estimates for programs and measures. All of the updated information will be used in evaluating the continued cost-effectiveness of existing programs, but updates to NTG estimates will not be applied retrospectively to measures that have already been installed or programs that have already been completed. If it becomes apparent during the implementation of a program that NTG factors are substantially different than anticipated, the Company will file appropriate program adjustments with the Commission.

32. Pursuant to the EM&V Agreement approved by the Commission in Docket No. E-7, Sub 979, for the Company's EE programs, with the exception of

the Non-Residential SmartSaver Custom Rebate Program, initial EM&V results shall be applied retrospectively to the beginning of the program offering to replace initial estimates of impacts. For the purposes of the vintage true-ups, these initial EM&V results will be considered actual results for a program until the next EM&V results are received. The new EM&V results will then be considered actual results going forward and applied prospectively for the purposes of truing up vintages from the first day of the month immediately following the month in which the study participation sample for the EM&V was completed. This EM&V will then continue to apply and be considered actual results until it is superseded by new EM&V results, if any.

33. EM&V for the Non-Residential SmartSaver Custom Rebate Program does not apply retrospectively and this program shall be trued up based on the actual participants and actual projects undertaken.

Opt-Outs for Industrial Customers and Certain Commercial Customers

34. Pursuant to Commission Rule R8-69(d), commercial customers with annual consumption of 1,000,000 kWh or greater in the billing months of the prior calendar year and all industrial customers may, by meeting certain requirements, elect not to participate in DSM/EE measures for which cost recovery is allowed through the DSM/EE rider and the DSM/EE EMF rider. For purposes of application of this option, a customer is defined as a metered account billed under a single application of a Company rate tariff. For commercial accounts, once one account meets the opt-out eligibility requirement,

all other accounts billed to the same entity with lesser annual usage located on the same or contiguous properties are also eligible to opt out of the DSM/EE rider and the DSM/EE EMF rider.

35. Pursuant to the Commission's Orders in Docket No. E-7, Sub 938, eligible non-residential customers may opt out of either or both of the DSM and EE categories of programs for one or more vintage years, as well as opt back into either or both the categories for a later vintage year. If a customer opts back into the DSM category, it cannot opt out again for three years; however, a customer has the freedom to opt in or out of the EE category for each vintage year. Additionally, if a customer opts out of paying the Rider for a vintage year after one or more in which the customer was "opted in"; the Company can charge the customer subsequent DSM/EE and DSM/EE EMF Riders only for those vintage years in which the customer actually participated in a DSM/EE program.

36. Eligible customers may opt out of the Company's EE or DSM programs each calendar year during the annual two-month enrollment period between November 1 and December 31 immediately prior to a new DSM/EE rider becoming effective on January 1. Eligible new customers have sixty days after beginning service to opt out.

37. In addition to the two month opt out period between November 1 and December 31 prior to the new DSM/EE rider becoming effective, during the first week of March (5 business days), customers who have previously opted out may elect to opt in and participate in EE and/or DSM programs during the remainder of the vintage year. Any customer choosing to opt in during the March

window would be back-billed for the rider amount that they would have paid had the chosen to participate during the November/December enrollment period.

Collaborative

38. Duke Energy Carolinas will continue to conduct quarterly collaborative stakeholder meetings for the purpose of collaborating on new program ideas, reviewing modifications to existing programs, ensuring an accurate public understanding of the programs and funding, reviewing the EM&V process, giving periodic status reports on program progress, helping to set EM&V priorities, providing recommendations for the submission of applications to revise or extend programs and rate structures, and guiding efforts to expand cost-effective programs for low-income customers.

39. The Collaborative should continue to be comprised of a broad spectrum of regional stakeholders that represent a balanced interest in the Company's DSM/EE effort and its impacts, as well as national EE advocates and experts. A third party facilitates the discussions. The collaborative will continue to determine its own rules of operation, including the process for setting the agendas and activities of the group, consistent with these terms. Members agree to participate in the advisory group in good faith consistent with mutually-agreed upon rules of participation. Meetings are open to additional parties who agree to the participation rules.

40. Duke Energy Carolinas will provide information related to the development of EE and DSM to stakeholders in a transparent manner.

The Company agrees to disclose program-related data at a level of detail similar to that which it has disclosed in other states or as disclosed by other regulated utilities in the Carolinas. The Company will share all aspects of the development and evaluation of programs, including the EM&V process.

41. At its discretion, the Company may require confidentiality agreements with members who wish to review confidential data or any calculations that could be used to determine the data. Disclosure of this data would harm Duke Energy Carolinas competitively and could result in financial harm to its customers.

42. Participation in the advisory group shall not preclude any party from participating in any Commission proceedings.

General Structure of Riders

43. All DSM/EE and DSM/EE EMF riders shall be calculated and charged to customers based on the revenue requirements for each separate vintage year. Separate DSM/EE and DSM/EE EMF riders shall be calculated for the Residential customer class and those rate schedules within the Non-Residential customer class that have Duke Energy Carolinas DSM/EE program options in which they can participate. One integrated (prospective) DSM/EE rider and one integrated DSM/EE EMF rider shall be calculated for the Residential class, to be effective each rate year. The integrated Residential DSM/EE EMF rider shall include all true-ups for each vintage year appropriately considered in each proceeding. Pursuant to the Commission's Orders in Docket No. E-7,

Sub 938, separate DSM and EE billing factors shall be calculated for the Non-Residential class. Additionally, the Non-Residential DSM and EE EMF billing factors shall be determined separately for each vintage year appropriately considered in each proceeding, so that the factors can be appropriately charged to Non-Residential customers based on their opt-in/out status and participation for each vintage year.

Cost Recovery

44. As provided in Rule R8-69 and G.S. 62-133.9(d), Duke Energy Carolinas shall be allowed to recover, through the DSM/EE rider, all reasonable and prudent costs reasonably and appropriately estimated to be incurred in expenses during the current rate period for DSM and EE programs that have been approved by the Commission under Rule R8-68. As permitted by G.S. 62-133.9(d), any of the Stipulating Parties may propose a procedure for the deferral and amortization in future DSM/EE riders of all or a portion of Duke Energy Carolinas' reasonable and prudent costs to the extent those costs are intended to produce future benefits.

45. The DSM/EE EMF rider shall reflect the difference between the reasonable and prudent costs incurred during the applicable test period (vintage year) and the revenues actually realized during such test period under the DSM/EE rider then in effect.

46. The cost and expense information filed by Duke Energy Carolinas pursuant to Commission Rules R8-68(c) and R8-69(f) shall be categorized by measurement unit or program, as applicable, and vintage year, consistent with the presentation included in the Company's application.

47. In accordance with Commission Rule R8-69(b)(6), Duke Energy Carolinas may implement deferral accounting for over- and underrecoveries of costs that are eligible for recovery through the annual DSM/EE rider. The balance in the deferral account(s), net of deferred income taxes, may accrue a return at the net-of-tax rate of return approved in Duke Energy Carolinas' then most recent general rate case. The methodology used for the calculation of interest shall be the same as that typically utilized for the Company's Existing DSM Program rider proceeding (taking into account any extensions of the EMF measurement period pursuant to Commission Rule R8-69(b)(2)). Pursuant to Commission Rule R8-69(c)(3), the Company is not allowed to accrue a return on Net Lost Revenues or the PPI.

48. For purposes of cost recovery through the DSM/EE and DSM/EE EMF riders, system-level costs shall be allocated to the North Carolina retail jurisdiction by use of the North Carolina and South Carolina allocation determinants in the following manner (no costs of any approved DSM or EE program will be allocated to the wholesale jurisdiction):

- (a) For EE programs, the costs of each program will be allocated based on the annual energy requirements of North Carolina and

South Carolina retail customers (grossed up for line losses), as reflected in the annual cost of service studies.

- (b) For DSM programs, the aggregated costs of DSM programs will be allocated based on the annual summer coincident peak demand of North Carolina and South Carolina retail customers, as reflected in the annual cost of service studies.

49. The allocation factors and inputs used to allocate the estimated rate period costs of DSM and EE programs shall be those drawn from the most recently filed cost of service study at the time the annual cost recovery filing is made. The allocations of costs shall be trued up at the time that finalized and trued-up costs for a given test period are initially passed through the DSM/EE EMF, using the most recently filed cost of service study at the time the filing is made (but for no later year than the vintage year being trued up). For subsequent true-ups of that vintage year, the cost of service study used will be the same as that used for the initial true-up.

50. For purposes of recovery through the DSM/EE and DSM/EE EMF riders, the Company's North Carolina retail jurisdictional costs for approved DSM and EE programs and measures shall be assigned or allocated to North Carolina retail customer classes as follows. For EE programs offered to Residential or Non-Residential customers, the North Carolina retail jurisdictional costs will be directly assigned to the customer group to which the program is offered. For DSM programs, the aggregated North Carolina retail jurisdictional cost of those

programs will be allocated to the Residential and Non-Residential classes based on the contribution of each class to the North Carolina retail jurisdictional peak demand used to make the jurisdictional allocation. The process of estimating and truing up the class assignments and allocations will be the same as practiced for jurisdictional allocations.

Net Lost Revenues

51. Unless otherwise ordered by the Commission, when authorized pursuant to Rule R8-69(c), Duke Energy Carolinas shall be permitted to recover, through the DSM/EE and DSM/EE EMF riders, Net Lost Revenues associated with the implementation of approved DSM or EE measurement units, subject to the restrictions set out below.

52. The North Carolina retail kWh sales reductions that result from an approved measurement unit installed in a given vintage year shall be eligible for use in calculating Net Lost Revenues eligible for recovery only for the first 36 months after the installation of the measurement unit. Thereafter, such kWh sales reductions will not be eligible for calculating recoverable Net Lost Revenues for that or any other vintage year.

53. Programs or measures with the primary purpose of promoting general awareness and education of EE and DSM activities, as well as research and development activities, are ineligible for the recovery of Net Lost Revenues.

54. In order to recover estimated Net Lost Revenues associated with a pilot program or measure, Duke Energy Carolinas must, in its application for

program or measure approval, demonstrate (a) that the program or measure is of a type that is intended to be developed into a full-scale, Commission-approved program or measure, and (b) that it will implement an EM&V plan based on industry-accepted protocols for the program or measure. No pilot program or measure will be eligible for Net Lost Revenue recovery upon true-up unless it (a) is ultimately proven to have been cost-effective, and (b) is developed into a full-scale, commercialized program.

55. Notwithstanding the allowance of 36 months' Net Lost Revenues associated with eligible kWh sales reductions, the kWh sales reductions that result from measurement units installed shall cease being eligible for use in calculating Net Lost Revenues as of the effective date of (a) a Commission-approved alternative recovery mechanism that accounts for the eligible Net Lost Revenues associated with eligible kWh sales reductions, or (b) the implementation of new rates approved by the Commission in a general rate case or comparable proceeding to the extent the rates set in the general rate case or comparable proceeding are set to explicitly or implicitly recover the Net Lost Revenues associated with those kWh sales reductions.

56. Recoverable Net Lost Revenues shall be calculated in a manner that appropriately reflects the incremental revenue losses suffered by the Company, net of avoided fuel and non-fuel variable O&M expenses.

57. Total Net Lost Revenues as measured for the 36-month period identified in paragraph 52 above shall be reduced by Net Found Revenues

during the same periods. The "decision tree" adopted by Order in Docket No. E-7, Sub 831 on February 8, 2011, should be applied for determining what constitutes Net Found Revenues. Duke Energy Carolinas shall closely monitor its utility activities to determine if they are causing a customer to increase demand or consumption, and shall identify and track all such activities with the aid of the "decision tree," so that they may be evaluated by intervening parties and the Commission as potential Net Found Revenues. Net found revenues shall be calculated in an appropriate and reasonable manner that mirrors the calculation used to determine Net Lost Revenues.

58. Recoverable Net Lost Revenues shall ultimately be based on kWh sales reductions and kW savings verified by the EM&V process and approved by the Commission. Recoverable Net Lost Revenues shall be estimated and trued-up, on a vintage year basis, as follows:

- (a) As part of the DSM/EE rider approved in each annual cost and incentive recovery proceeding, Duke Energy Carolinas shall be allowed to recover the appropriate and reasonable level of recoverable Net Lost Revenues associated with each applicable program and vintage year (subject to the limitations set forth in this Mechanism), estimated to be experienced during the rate period for which the DSM/EE rider is being set.
- (b) Net lost revenues related to any given program/measure and vintage year shall be trued-up through the DSM/EE EMF rider in

subsequent annual cost and incentive recovery proceedings based on the Commission-approved results of the appropriate EM&V studies related to the program/measure and vintage year, as determined pursuant to the EM&V Agreement.

- (c) The true-up shall be calculated based on the difference between projected and actual recoverable Net Lost Revenues for each measurement unit and vintage year under consideration, accounting for any differences derived from the completed and reviewed EM&V studies, including: (1) the projected and actual number of installations per measurement unit; (2) the projected and actual net kWh and kW savings per installation; (3) the projected and actual gross lost revenues per kWh and kW saved; and (4) the projected and actual deductions from gross lost revenues per kWh and kW saved.
- (d) The combined total of all vintage year true-ups calculated in a given year's Rule R8-69 proceeding shall be incorporated into the appropriate DSM/EE EMF billing factor.

59. Recoverable Net Lost Revenues shall be directly assigned to the program and vintage year with which they are associated.

Portfolio Performance Incentive (PPI)

60. When authorized pursuant to Rule R8-69(c), Duke Energy Carolinas shall be allowed to collect a PPI for its DSM/EE portfolio for each vintage year, separable into Residential, Non-Residential DSM, and Non-Residential EE categories. The PPI shall be subject to the restrictions set out below.

61. Programs or measures with the primary purpose of promoting general awareness of and education about EE and DSM activities, as well as research and development activities, are ineligible to be included in the portfolio for purposes of the PPI calculation.

62. Unless (a) the Commission approves Duke Energy Carolinas' specific request that a pilot program or measure be eligible for PPI inclusion when Duke Energy Carolinas seeks approval of that program or measure, and (b) the pilot is ultimately commercialized, pilot programs or measures are ineligible for and will not be factored into the calculation of the PPI.

63. Low-Income programs approved with expected UCT results less than 1.00 and other non-cost-effective programs with similar societal benefits as approved by the Commission shall not be included in the portfolio for purposes of the PPI calculation.

64. The PPI shall be based on net dollar savings for Duke Energy Carolinas' DSM/EE portfolio, as calculated using the UCT, on a total system basis. The North Carolina retail jurisdictional and class portions of the system-basis net dollar savings shall be determined in the same manner as utilized to determine the North Carolina retail jurisdictional and class portions of recoverable system costs. The portfolio PPI for each vintage year shall be incorporated into Duke Energy Carolinas' DSM/EE or DSM/EE EMF billing factors, as appropriate.

65. In its annual filing pursuant to Rule R8-69(f), Duke Energy Carolinas shall file an exhibit that indicates, for each program for which it seeks PPI inclusion, the annual projected and actual utility costs, participant costs, number of measurement units installed, per kW and kWh impacts for each measurement unit, and per kW and kWh avoided costs for each measurement unit, consistent with the UCT, related to the applicable vintage year installations that it requests the Commission to approve. Upon its review, the Commission will make findings based on Duke Energy Carolinas' annual filing for each program which is included in an estimated or trued-up PPI calculation for any given vintage year.

66. Unless the Commission determines otherwise in an annual DSM/EE rider proceeding, the amount of the pre-income-tax PPI initially to be recovered for the entire DSM/EE portfolio for a vintage year shall be equal to 11.5% multiplied by the present value of the estimated net dollar savings

associated with the DSM/EE portfolio installed in that vintage year, calculated by DSM/EE program using the UCT (and excluding Low Income Programs and other specified societal programs). The present value of the estimated net dollar savings shall be the difference between the present value of the annual lifetime avoided cost savings for measurement units projected to be installed in that vintage year and the present value of the annual lifetime program costs for those measurement units. The annual lifetime avoided cost savings for measurement units installed in the applicable vintage year shall be calculated by multiplying the number of each specific type of measurement unit projected to be installed in that vintage year by the most current estimates of each lifetime year's per installation kW and kWh savings and by the most current estimates of each lifetime year's per kW and kWh avoided costs.

67. At the outset of the application of this Mechanism, the entire PPI related to a vintage year shall be recoverable in the rate period covering that vintage year (subject to true-up). However, any of the Stipulating Parties may propose a procedure to convert a vintage year PPI into a stream of levelized annual payments not to exceed ten years, accounting for and incorporating Duke Energy Carolinas' overall weighted average net-of-tax rate of return approved in Duke Energy Carolinas' most recent general rate case as the appropriate discount rate.

68. For the PPI for Vintage Year 2014, the per kW avoided capacity costs used to calculate avoided cost savings shall be those reflected in the filing by Duke Energy Carolinas in Docket No. E-100, Sub 136. The per kWh avoided

energy costs shall be those reflected in or underlying the most recently filed integrated resource plan (IRP). If both the per kW avoided capacity costs and per kWh avoided energy costs approved by the Commission in Sub 136 and the IRP proceeding are within 2% of the costs filed by the Company, no change from the costs used will be necessary. If one or the other changes by more than 2%, both costs will be changed to the approved amounts.

69. For the PPI for Vintage Years 2019 and afterwards, the program-specific per kW avoided capacity benefits and per kWh avoided energy benefits used for the initial estimate of the PPI and any PPI true-up will be derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing. However, for the calculation of the underlying avoided energy credits to be used to derive the program-specific avoided energy benefits, the calculation will be based on the projected EE portfolio hourly shape, rather than the assumed 24x7 100 MW reduction typically used to represent a qualifying facility.

70. Unless the Stipulating Parties agree otherwise, Duke Energy Carolinas shall not be allowed to update its avoided capacity costs and avoided energy costs after filing its annual cost and incentive recovery application for purposes of determining the DSM/EE and DSM/EE EMF riders in that proceeding.

71. When Duke Energy Carolinas files for its annual cost recovery under Rule R8-69, it shall comply with the filing requirements of Rule R8-69(f)(1)(iii), reporting all final measurement and verification data to assist the Commission and Public Staff in their review and monitoring of the impacts of the DSM and EE measures.

72. Duke Energy Carolinas bears the burden of proving all dollar savings and costs included in calculating the PPI. As provided in Rule R8-68(c)(3)(iii), Duke Energy Carolinas shall be responsible for the EM&V of energy and peak demand savings consistent with its EM&V plan.

73. The PPI for each vintage year shall ultimately be based on net dollar savings as verified by the EM&V process and approved by the Commission. The PPI for each vintage year shall be trued-up as follows:

- (a) As part of the DSM/EE rider approved in each annual cost and incentive recovery proceeding, Duke Energy Carolinas shall be allowed to recover an appropriately and reasonably estimated PPI (subject to the limitations set forth in this Mechanism) associated with the vintage year covered by the rate period in which the DSM/EE rider is to be in effect.
- (b) The PPI related to any given vintage year shall be trued-up through the DSM/EE EMF rider in subsequent annual cost and incentive recovery proceedings based on the Commission-approved results of the appropriate EM&V

studies related to the program/measure and vintage year, as determined pursuant to the EM&V Agreement.

- (c) The PPI amount ultimately to be recovered for a given vintage year shall be based on the present value of the actual net dollar savings derived from all measurement units installed in that vintage year, as associated with each DSM/EE program offered during that year (excluding Low Income Programs and other specified societal programs), and calculated by DSM/EE program using the UCT. The present value of the actual net dollar savings shall be the difference between the present value of the annual lifetime avoided cost savings for measurement units installed in that vintage year and the present value of the annual lifetime program costs for those measurement units. The annual lifetime avoided cost savings for measurement units installed in the applicable vintage year shall be calculated by multiplying the number of each specific type of measurement unit installed in that vintage year by each lifetime year's per installation kW and kWh savings (as verified by the appropriate EM&V study pursuant to the EM&V agreement) and by each lifetime year's per kW and kWh avoided costs as determined when calculating the initially estimated PPI for the vintage year. The Stipulating Parties agree to make all

reasonable efforts to ensure that all vintages are fully trued-up within 24 months of the vintage program year.

74. The combined total of all vintage year true-ups of the PPI calculated in a given year's Rule R8-69 proceeding shall be incorporated into the appropriate DSM/EE EMF billing factor.

75. The PPI for each vintage year shall be allocated to DSM and EE programs in proportion to the present value net dollar savings of each program for the vintage year, as calculated pursuant to the method described herein.

Additional Incentive

76. If the Company achieves incremental energy savings of 1% of the prior year's Duke Energy Carolinas' system retail electricity sales in any year during the five-year 2014-2018 period, the Company will receive a bonus incentive of \$400,000 for that year. The Company is eligible to receive the bonus incentive each year during the five-year 2014-2018 period. Verification of this achievement will be obtained through the EM&V process discussed elsewhere in this Mechanism.

Financial Reporting Requirements

77. In its quarterly ES-1 Reports to the Commission, Duke Energy Carolinas shall calculate and present its primary North Carolina retail jurisdictional earnings by including all actual EE and DSM program revenues, including PPI and Net Lost Revenue incentives, and costs. Additionally, the Company shall prepare and present (a) supplementary schedules setting forth its

North Carolina retail jurisdictional earnings excluding the effects of the PPI; (b) supplementary schedules setting forth its North Carolina retail jurisdictional earnings excluding the effects of the Company's EE and DSM programs; and (c) supplementary schedules setting forth earnings, including overall rates of return, returns on common equity, and margins over program costs actually realized from its EE and DSM programs in total and stated separately by program class (program classes are hereby defined to be (i) EE programs and (ii) DSM programs). Detailed workpapers shall be provided for each scenario described above. Such workpapers, at a minimum, shall clearly show actual revenues, expenses, taxes, operating income, rate base/investment, including components, and the applicable capitalization ratios and cost rates, including overall rate of return and return on common equity. Net lost revenues realized (estimated, if not known) for each reporting period shall be clearly disclosed as supplemental information.

Review of Mechanism

78. The terms and conditions of this Mechanism shall be reviewed by the Commission every four years unless otherwise ordered by the Commission. The Company and other parties shall submit any proposed changes to the Commission for approval at the time of the filing of the Company's annual DSM/EE rider filing. During the time of review, the Mechanism shall remain in effect until further order of the Commission revising the terms of the Mechanism or taking such other action as the Commission may deem appropriate.

Duke Energy Carolinas, LLC
Comparison of "As-Filed" Cost-Effectiveness Scores to Previous DSM/EE Riders
Docket Number E-7, Sub 1164

Williamson Exhibit No. 1

I/A

	2016 - filing year vintage 2017 Evans Exhibit 7 in Sub 1105				2017 - filing year vintage 2018 Evans Exhibit 7 in Sub 1130				2018 - filing year vintage 2019 Evans Exhibit 7 in Sub 1164				TRC % Change
	UCT	TRC	RIM	PCT	UCT	TRC	RIM	PCT	UCT	TRC	RIM	PCT	
<u>Residential Programs:</u>													
Appliance Recycling Program	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy Efficiency Education	1.50	2.00	0.57	-	1.72	2.32	0.90	-	1.22	1.69	0.53	-	-27%
Energy Efficient Appliances & Devices	2.79	5.55	0.9	12.02	3.19	3.43	0.91	4.36	2.4	2.17	0.42	6.11	-37%
Residential Smart Saver EE (formerly, HVAC EE)	-	-	-	-	1.60	0.99	0.83	1.39	0.94	0.59	0.45	1.52	-40%
Income-Qualified Energy Efficiency and Weatherization Assistance	0.35	1.34	0.29	-	0.49	4.51	0.38	-	0.19	0.83	0.16	-	-82%
Multi-Family Energy Efficiency	3.8	5.25	1.1	-	4.00	6.09	1.06	-	2.82	4.71	0.59	-	-23%
My Home Energy Report	1.47	1.47	0.76	-	1.98	1.98	0.86	-	1.56	1.56	0.57	-	-21%
Power Manager	4.29	7.92	4.29	-	5.18	10.33	5.18	-	4.33	8.86	4.33	-	-14%
Residential Energy Assessments	3.4	3.63	1.43	-	2.65	3.05	1.06	-	1.41	1.56	0.54	-	-49%
Residential Total	2.48	4.09	1.25	21.79	2.91	3.65	1.20	6.03	2.22	2.60	0.70	7.69	-29%
<u>Non-Residential Programs:</u>													
Business Energy Report	1.78	1.78	0.78	-	1.39	1.39	0.71	-	-	-	-	-	-
Non Residential Smart Saver Custom Energy Assessments	2.17	1.26	0.91	1.44	5.87	1.64	1.56	1.36	2.17	0.89	0.68	1.78	-46%
Non Residential Smart Saver Custom	3.75	1.52	1.11	1.42	4.88	1.96	1.43	1.87	2.38	1.07	0.67	2.18	-45%
EnergyWise For Business	1.65	2.36	1.13	-	1.44	2.70	0.94	-	0.83	1.21	0.68	-	-55%
Non Residential Smart Saver Energy Efficient Food Service Products	3.27	2.25	1.08	2.96	4.44	2.74	1.21	2.65	2.68	1.95	0.61	3.18	-29%
Non Residential Smart Saver Energy Efficient HVAC Products	2.26	1.73	1.17	1.45	3.41	2.11	1.53	1.29	2.04	1.63	0.88	1.82	-23%
Non Residential Smart Saver Energy Efficient Lighting Products	3.73	1.7	1.18	1.72	4.12	1.96	1.16	1.61	3.48	1.44	0.74	2.17	-27%
Non Residential Smart Saver Energy Efficient Pumps and Drives Products	3.57	2.49	1.1	2.81	3.71	3.51	0.85	3.35	2.54	2.45	0.54	3.56	-30%
Non Residential Smart Saver Energy Efficient IT Products	3.47	2.53	0.93	3.82	4.14	2.34	0.89	3.16	2.36	1.77	0.59	3.79	-24%
Non Residential Smart Saver Energy Efficient Process Equipment Products	7.17	5.93	1.35	5.83	2.39	2.42	0.85	2.67	2.13	2.23	0.47	4.21	-8%
Non Residential Smart Saver Performance Incentive	-	-	-	-	3.53	1.14	1.29	1.08	2.7	0.81	0.69	1.50	-29%
Small Business Energy Saver	2.51	2.56	1.12	2.28	3.91	2.50	1.46	2.38	2.59	1.61	0.77	3.00	-36%
Smart Energy in Offices	2.52	3.47	0.83	-	3.75	5.84	1.69	-	-	-	-	-	-
PowerShare Call Option	-	-	-	-	-	-	-	-	-	-	-	-	-
PowerShare	2.8	23.42	1.88	-	3.24	60.80	2.05	-	2.9	41.14	2.90	-	-32%
Non-Residential Total	3.00	2.27	1.22	1.99	3.94	2.50	1.41	2.04	2.69	1.67	0.85	2.41	-33%
Overall Portfolio total:	2.76	2.78	1.23	2.90	3.44	2.88	1.31	2.78	2.46	1.98	0.78	3.48	-31%

Duke Energy Carolinas, LLC
Impacts of Company and Public Staff's Differing Methodologies of Avoided Capacity Costs
Docket Number E-7, Sub 1164

Williamson Exhibit No. 2

IIA

Program	As Filed ¹				Public Staff's Position				Delta ²			
	UCT	TRC	RIM	PCT	UCT	TRC	RIM	PCT	UCT	TRC	RIM	PCT
Residential Programs:												
Energy Education Program for Schools	1.22	1.69	0.53		1.06	1.47	0.46		-13%	-13%	-13%	
Energy Efficient Appliances & Devices	2.40	2.17	0.42	6.11	2.21	2.00	0.39	6.11	-8%	-8%	-8%	0%
Smart Saver EE Program (formerly, HVAC EE)	0.94	0.59	0.45	1.52	0.87	0.55	0.42	1.52	-7%	-7%	-7%	0%
Income-Qualified EE Products & Services	0.19	0.83	0.16		0.17	0.74	0.14		-10%	-10%	-10%	
Multi-Family EE Products & Services	2.82	4.71	0.59		2.68	4.46	0.56		-5%	-5%	-5%	
My Home Energy Report	1.56	1.56	0.57		1.16	1.16	0.43		-25%	-25%	-25%	
Power Manager	4.33	8.86	4.33		1.98	4.05	1.98		-54%	-54%	-54%	
Residential Energy Assessments	1.41	1.55	0.54		1.32	1.45	0.50		-6%	-6%	-6%	
Residential Total	2.22	2.60	0.70	7.69	1.59	1.87	0.50	7.69	-28%	-28%	-29%	0%
Non-Residential Programs:												
Non Residential Smart Saver Custom Energy Assessments	2.17	0.89	0.68	1.78	2.01	0.82	0.63	1.78	-7%	-7%	-7%	0%
Non Residential Smart Saver Custom	2.38	1.07	0.67	2.18	2.21	0.99	0.62	2.18	-7%	-7%	-7%	0%
EnergyWise For Business	0.83	1.21	0.68		0.53	0.77	0.43		-37%	-37%	-37%	
Non Residential Smart Saver Energy Efficient Food Service Products	2.68	1.95	0.61	3.18	2.53	1.84	0.57	3.18	-5%	-5%	-5%	0%
Non Residential Smart Saver Energy Efficient HVAC Products	2.04	1.63	0.88	1.82	1.82	1.46	0.79	1.82	-11%	-11%	-11%	0%
Non Residential Smart Saver Energy Efficient Lighting Products	3.48	1.44	0.74	2.17	3.25	1.34	0.69	2.17	-7%	-7%	-7%	0%
Non Residential Smart Saver Energy Efficient Pumps and Drives Products	2.54	2.45	0.54	3.56	2.34	2.25	0.49	3.56	-8%	-8%	-8%	0%
Non Residential Smart Saver Energy Efficient IT Products	2.36	1.77	0.59	3.79	2.35	1.76	0.58	3.79	-1%	-1%	-1%	0%
Non Residential Smart Saver Energy Efficient Process Equipment Products	2.13	2.23	0.47	4.21	2.00	2.09	0.44	4.21	-6%	-6%	-6%	0%
Non Residential Smart Saver Performance Incentive	2.70	0.81	0.69	1.50	2.50	0.76	0.64	1.50	-7%	-7%	-7%	0%
Small Business Energy Saver	2.59	1.61	0.77	3.00	2.35	1.46	0.70	3.00	-10%	-10%	-10%	0%
PowerShare	2.90	41.14	2.90		1.32	18.78	1.32		-54%	-54%	-54%	
Non-Residential Total	2.69	1.67	0.85	2.41	2.23	1.39	0.70	2.41	-17%	-17%	-17%	0%
Overall Portfolio Total	2.46	1.98	0.78	3.48	1.92	1.55	0.60	3.48	-22%	-22%	-22%	0%

¹Evans Exhibit 7 of the DSM/EE Rider Filing.

²This delta reflects the impacts of applying zero avoided capacity payments to years where the Company's 2016 IRP has designated that capacity is not needed.

Duke Energy Carolinas, LLC
Timeline of Cost-Effectiveness for the Residential SmartSaver EE Program
Docket Number E-7, Sub 1164

Williamson Exhibit 3

I/A

Date Filed	March 6, 2013	March 5, 2014	March 4, 2015	October 2, 2015	March 9, 2016		March 8, 2017	July 20, 2017	March 7, 2018
Filing Location	Rider Filing 2013 E-7, Sub 1031	Rider Filing 2014 E-7, Sub 1050	Rider Filing 2015 E-7, Sub 1073	E-7, Sub 1032 modification ²	Rider Filing 2016 E-7, Sub 1105	E-7, Sub 1032 V2017 ⁴	Rider Filing 2017 E-7, Sub 1130	E-7, Sub 1032 modification ²	Rider Filing 2018 E-7, Sub 1164
Vintage Year	V2014 ¹	V2015 ¹	V2016 ¹		V2017 ³		V2018 ¹		V2019 ¹
Residential Smart Saver EE Program (formerly, HVAC EE)	1.58	1.07	0.74	0.78	-	0.61	0.99	1.08	0.59

¹ Indicates a year long projection for purposes of a rider proceeding

² Indicates a multi-year TRC value for purposes of a modification filing

³ Indicates a year where DEC states that data was not available to determine a cost-effectiveness score

⁴ Indicates an actual calendar year end TRC value for vintage year 2017

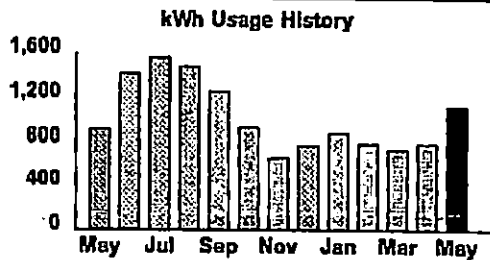


Customer Bill

page 1 of 2

ROBERT P EVANS

Account number [REDACTED]
Amount due **\$116.49**
Current charges past due after **Jun 14**
Thank you for your payment Apr 27 **\$116.49**
Usage period Apr 18 - May 18
This bill was mailed on May 21, 2018



Usage
Meter number [REDACTED]
Readings: May 18 91367
Apr 18 90228
kWh usage **1141**
Days in period 30 Average kWh per day 38

Billing Residential Service rate

HOUSE - 30 Days

Electric service	125.09
Energy conservation discount	-5.20
REPS Adjustment	0.55
NC GreenPower Renewable Energy	4.00
Non-Regulated Surge Protection	8.99
7.25% North Carolina other sales tax	0.50
7% North Carolina sales tax	8.43
Current bill amount	140.36
Balance before current bill	-197.86
New account balance	-57.50
Amount due (Equal Payment Plan)	\$116.49

Please note your electric services may not be terminated for failure to pay the non-regulated charges listed.

This bill is subject to a 1% per month late payment charge after 06/14/2018.

Please detach here.

Turn over for helpful phone numbers and customer service tips.

PIN: [REDACTED]

Return portion

ROBERT P EVANS

Account number [REDACTED]

Amount due **\$116.49**
Current charges past due after **Jun 14**

Make checks payable and return to:

Duke Energy Progress
PO BOX 1003
Charlotte NC 28201-1003



Home Energy Report

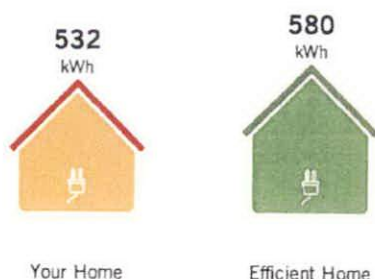
March 2018

I/H

Way to go! You are among the **most efficient** homes in your area and the envy of your neighbors. Although you're doing a great job, there still may be ways for you to save even more. Check out the tips below.

How am I doing?

My Home Comparison



Forecasted electricity use for April.

Areas you can focus on to save



Who am I being compared to?

Group size
3,893 Homes

Square footage
2,350-2,950

Year built
1949-1959

Heating
Non-electric heating



Make your report
more accurate.
Update your
profile online!

We compare you to nearby similar homes based on the age, size, and heating source of your home. Update this information by completing a home profile at duke-energy.com/MyHomeEnergy or calling 888.873.3853.

duke-energy.com/MyHomeEnergy

How can I save more?



Every little bit helps!

Store hot coffee in a thermos or carafe

Coffee - it's not just for mornings anymore. To get more out of your favorite brew, turn off the hot plate on your coffee maker and transfer your coffee to a thermos or insulated carafe. You'll save energy and your coffee will stay fresh longer. Savor the flavor AND the savings!



Save up to \$23 per year.

Use energy efficient lighting indoors

Use energy efficient compact fluorescent (CFLs) bulbs or LEDs to provide quality lighting throughout your home. CFLs and LEDs use 75-90% less energy than incandescent bulbs and last 10-25 times longer. Since most electricity used by an incandescent bulb is wasted as heat, you can even save on air conditioning by switching to CFLs or LEDs.

More Savings Tips at duke-energy.com/SavingTips

Contact us Call 888.873.3853 Monday - Friday, 7 a.m. to 7 p.m. ET and Saturday, 8 a.m. to 1 p.m. ET

Email HomeReport@duke-energy.com

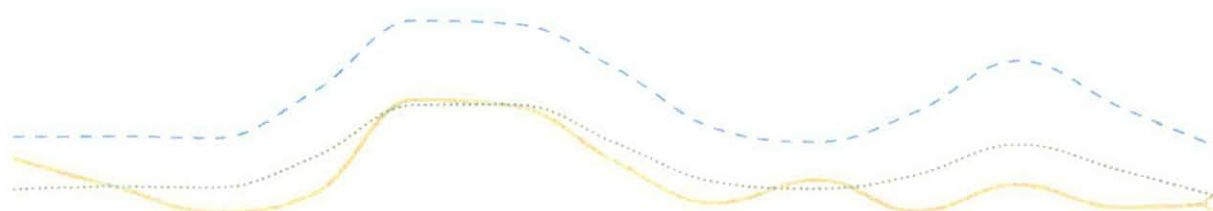
Reference Number:

Account Number:

electric use over time

Mar 2017 to Mar 2018

— You — Average Efficient



KWh													
AVG F°	47°	62°	66°	74°	78°	77°	68°	67°	54°	45°	36°	51°	48°
	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR

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**Duke Energy Carolinas
Response to
NC Public Staff Data Request
Data Request No. NCPS 38-4**

Docket No. E-7, Sub 1146

**Date of Request: October 31, 2017
Date of Response: November 17, 2017**

☐

CONFIDENTIAL

☒

NOT CONFIDENTIAL

Confidential Responses are provided pursuant to Confidentiality Agreement

The attached response to NC Public Staff Data Request No. 38-4, was provided to me by the following individual(s): Kathy Lowe, CSS Senior Business Analyst, Customer Connect Engagement Solutions, and was provided to NC Public Staff under my supervision.

Heather Smith
Deputy General Counsel
Duke Energy Carolinas

NCPS 38-4

Request:

Please provide a comprehensive list or matrix of the capabilities of the current CIS and the proposed CIS. The Company's response should also include any capabilities that are planned for in the next 5 to 10 years, particularly any capabilities related to the Company's grid modernization and smart meter deployment initiatives.

Response:

The Customer Connect program team prepared a matrix to compare the capabilities of the current customer information system, CBIS, with those of the future state Customer Connect platform. The business requirements spreadsheet provided in response to Public Staff DR 38-8 was leveraged as a basis for comparing the two platforms, considering requirements as being synonymous with features and capabilities. For each capability that the future state Customer Connect platform would provide out-of-the-box or with routine configuration, the team assessed whether the current CBIS software provides similar capabilities. The team then calculated scores at a summary capability area level for CBIS, expressed from 0-100, to represent the approximate percentage of the total future state capabilities that CBIS is capable of today. The scores were then augmented with example capability gaps with the current CBIS system that negatively impact the customer experience, with a brief description of how those gaps will be addressed by the new Customer Connect platform and thus improve the customer experience (found on page 1 of attachment DEC NC Docket No. E-7, Sub 1146 PS 38-4). The team also prepared a comparison matrix to compare key, specific customer capabilities between CBIS and Customer Connect, shown on page 2 of the attachment.

As you will see in the analysis, overall the current CBIS system provides approximately 40% of the capabilities that we will have through the new Customer Connect platform. It is important to note that the new platform is not just a like-for-like replacement of the core meter-to-cash system; rather it is the next generation platform with new customer engagement and integrated operations and analytics capabilities that will improve the customer's experience.



DEC NC Docket No.
E-7, Sub 1146 PS 38-

Customer Connect – Current CBIS vs. Future Customer Connect Platform

Capability Comparison

Capability Area	CIM Score
Customer Management	40
Customer Service	50
Customer Self-Service	10
Start / Stop / Transfer	60
Multi-Company	10
Billing	50
Payments	60
Credit & Collections	60
Sales	0
Field Service	60
Meter Reading	80
Accounting	70
Inventory	40
Reporting	70
Contracts & Lighting	0
Mobility	0
TOTAL ALL AREAS	40

All CBIS scores vs. future state Customer Connect score of 100

Top 5 New Customer Connect Features & Their Customer Experience Implications

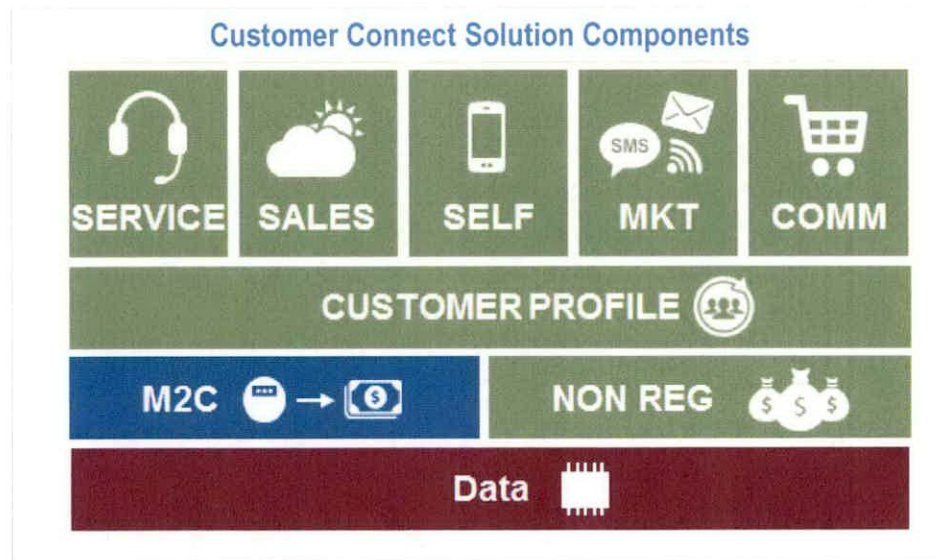
New Feature	What It Means for Customers
Customer Data Model	Our current state system was designed as a premise-based system. It was developed to communicate with the meter attached to a premise, without regard to who may be consuming the services provided through the meter or how they may be consuming those services. Customer Connect will have a customer-centric data model to enable a "one customer" view across Duke Energy, enabling us to know the customer better and provide a more streamlined, personalized experience.
360° View Customer Profile	In current state, systems merely store basic customer information – name, phone, address, premise and historical usage, billing and payment information – preventing us from knowing our customers beyond these basic "ratepayer" attributes. Customer Connect will store all of that same information but much more. The new platform will gather all of the relevant touchpoints that customers are having with Duke Energy in real time – web visits, phone calls, power outages, outbound communications, product and service participation, etc. – to build out a 360 degree view of customers that can be leveraged to better serve them and personalize their experiences. This customer profile data is then leveraged by the integrated analytics capabilities of the new platform to personalize experiences and better serve customers through every channel. For example, the new platform will predict the intent of customers when they call Duke Energy, improving their experience in the IVR and routing them to the customer care representative best suited to meet their needs. This same capability can be leveraged to prioritize what information and when it is communicated to customers via web, email and other channels to ensure it is timely, relevant and valuable to them. These are just two examples of the nearly limitless opportunities to leverage real-time analytics to improve our customers' everyday experience with Duke Energy.
Integrated Analytics	
Multi-Company	In current state, customers exist as separate entities across jurisdictions. When a customer moves from one jurisdiction to another, which in certain areas of North Carolina could literally just be down the road across DEP and DEC service territories, all information about that customer is lost – account numbers, communications preferences, payment and credit history, product and service participation, etc. Customers do not understand why this happens and are frustrated by the experience. In the future, these types of account attributes remain at the customer level throughout their experience with Duke Energy as they move between locations and jurisdictions.
Modern, Configurable Billing Engine	In current state, many new rates are not practical or are very time consuming to implement due to the architecture of the system and the complexity of coding and testing the rates. In the future, rates are configurable and much simpler to implement, greatly improving our responsiveness to regulatory or market changes. Also, many modern rate structures (e.g. net metering, time-of-use, etc.) are pre-built into the system because of the software's experience being leveraged in European or other markets.

Additional Feature Comparison

Knowing The Customer		
Feature	CBIS	Cust Conn
Interaction history tracking		10
Customer sentiment analysis		10
History of inbound and outbound communications		10
Preferred communication channels	5	10
Effective dates for communications, addresses		10
Two-way texting		10
Social media and mobile app integration	5	10
Targeted customer communications		10
Knowing all customers in a household or premise		10

Making It Easier For Customers		
Feature	CBIS	Cust Conn
Online requests for new service	5	10
Switch between channels during requests		10
Online shopping for products and services	5	10
Transfer account preferences and prod./svcs. when moving	5	10
Real-time status updates for service orders		10
Usage alerts	5	10
Billing alerts		10
Payment alerts	5	10
Universal, customer-friendly bill format		10

Giving Customers More Options		
Feature	CBIS	Cust Conn
Personalized recommendations for prod. and svcs.		10
New rate and pricing structures	5	10
Summary billing	5	10
Usage tracking and billing for net metering	5	10
Flexible billing frequency and timing options	5	10
Customer portals for landlords, builders, agencies	5	10
Online rate analysis and comparison tools		10
Flexible payment options	5	10
Split accountability for bill payments (i.e. roommate situation)		10



Legend: <Blank> No capabilities in this area | 5 Partially meets future state capability expectations | 10 Fully meets future state capability expectations

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-7, SUB 1032

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of
Request by Duke Energy Carolinas, LLC,) ORDER ON APPLICATION
for Approval of Modifications to Residential) FOR APPROVAL OF PROGRAM
HVAC Energy Efficiency Program) MODIFICATIONS

BY THE COMMISSION: On October 2, 2015, Duke Energy Carolinas, LLC (DEC or Company), filed an application seeking approval of modifications to its Residential HVAC¹ Energy Efficiency – Air Conditioning Program (Program). DEC requests that the Commission:

1. Approve the Residential HVAC Energy Efficiency Program – Air Conditioning tariff at the Commission's earliest convenience;
2. Approve the Residential HVAC Energy Efficiency Program – Air Conditioning, as modified, to remain in effect until such time that the Commission orders otherwise;
3. Find that the Residential HVAC Energy Efficiency Program – Air Conditioning, with modifications, continues to meet the requirements of a "new" energy efficiency (EE) program consistent with Rule R8-69 (*sic*: R8-68);
4. Find that all costs incurred by DEC associated with the Residential HVAC Energy Efficiency Program – Air Conditioning will be eligible for consideration for cost recovery through the annual demand-side management and energy efficiency (DSM/EE) rider in accordance with Commission Rule R8-69(b); and
5. Approve the proposed utility incentives for inclusion in the annual DSM/EE rider in accordance with Rule R8-69.

The Program was originally approved as a new EE program in the Commission's *Order Approving DSM/EE Programs and Stipulation of Settlement*, issued October 29, 2013, in Docket No. E-7, Sub 1032. It includes EE measures associated with duct insulation and sealing, attic insulation and air sealing, tune-up of existing HVAC systems, and replacement of existing central air conditioning and heat pump HVAC systems. The Program replaced the original Residential Smart Saver program that was approved February 26, 2009, in Docket No. E-7, Sub 831, and which had many of the same EE measures.

¹ HVAC stands for Heating, Ventilation, and Air Conditioning. A major goal of the Program is to incentivize customers to install higher efficiency heat pumps and central air conditioning equipment.

The proposed modifications included in the Company's October 2, 2015, Application include:

- Replacement of the existing single initial/maximum incentive structure for replacement HVAC equipment, with a three-tier incentive structure based on the efficiency of the new HVAC system;
- Addition of a programmable, Wi-Fi-enabled smart thermostat measure;
- Addition of a "quality installation" provision to encourage the proper installation of HVAC systems; and
- Addition of a referral channel to guide interested customers to one or more DEC-approved HVAC contractors who have paid DEC a fee to be on the referral list.

On October 30, 2015, the Commission granted the Public Staff and other interested parties an extension of time until December 2, 2015, to file a protest, an intervention, or comments regarding the proposed Program.

On November 5, 2015, the North Carolina Building Performance Association filed a letter in support of DEC's application. The letter indicates that a substantial portion of the EE work of home and building performance contractors is generated by utility-funded activities such as the Program.

On December 2, 2015, the Southern Environmental Law Center, on behalf of the Natural Resources Defense Council, the Sierra Club, the South Carolina Coastal Conservation League, and Southern Alliance for Clean Energy (collectively, SELC) filed a letter in support of DEC's application, asserting that the proposed modifications to the Program would provide customers with additional opportunities for energy savings, increase cost-effectiveness, and preserve DEC's only residential HVAC incentive program. SELC offered several additional recommendations:

- That the Company bundle air- and duct-sealing measures with high-Seasonal Energy Efficiency Ratio (SEER) unit upgrade.
- That the Company provide all participants with educational resources such as online tutorials on properly programming a thermostat, reducing overrides of programmed settings, and other behavior changes that can increase effectiveness and lower energy usage.
- That the Company consider eliminating measures that are not cost-effective on their own or combine individual measures into a bundled portfolio of whole-house measures.
- With respect to the referral channel, that the Company conduct: (1) a survey of marketing acquisition costs for contractors in DEC's service territory; (2) an assessment of the cost-effectiveness of the Program's individual measures; (3) a survey of best practices in the development and implementation of educational tools for residents acquiring a programmable thermostat; (4) an updated market potential analysis to determine the true potential of efficiency

measures in the Company's service territory; and (5) an analysis of a bundled approach of non-HVAC EE measures that could be combined with an on-bill financing program to deepen energy savings potential.

- Further, that the Company review the referral component after the first year of operation to determine the extent of contractor engagement.

On December 2, 2015, the Public Staff filed comments on the proposed modifications to the Program. A major concern raised by the Public Staff is the failure of the Program as a whole, and some of the individual measures even with the proposed modifications, to achieve cost-effectiveness under the Total Resource Cost (TRC) test. Specifically, the Public Staff commented that:

- The proposed new quality installation measure will be cost-effective under the TRC test.
- The proposed new smart thermostat has TRC results of 0.68 and 0.71 (referral and non-referral, respectively) and does not appear to enhance the overall cost-effectiveness of the Program.
- The modification to replace the single incentive for HVAC equipment replacement with a three-tier incentive generally will have a TRC above 1.0 for the referral channel but below 1.0 for the non-referral channel. The Public Staff has not been able to determine if the proposed change to a three-tier incentive, with or without referral fees, would enhance the TRC for the Program compared to the existing single-incentive with or without referral fees.

The Public Staff also recommended, to the extent any modifications are approved, that the modifications be as follows:

- The baseline efficiency standard for geothermal heat pumps be an Energy Efficiency Ratio (EER) of 16.
- DEC file its contractor agreement once drafted, and allow review and comment by the Public Staff.
- DEC file its quality installation checklist once drafted, and allow review and comment by the Public Staff.
- DEC include in its next Evaluation, Measurement and Verification (EM&V) report certain additional information.

On December 4, 2015, the North Carolina Sustainable Energy Association (NCSEA) filed a letter in support of the proposed modifications to the Program. NCSEA additionally recommended that duct-sealing be mandatory rather than optional when HVAC units with a higher SEER are installed, and that visual inspection and diagnostics, such as a duct blaster test, be mandatory as well.

On December 14, 2015, DEC filed Reply Comments. DEC emphasized that the proposed modifications will significantly lower program costs and high efficiency HVAC equipment costs used in the Application should decline in the future, which would

increase the TRC result modeled for its Application. DEC noted that there would be an 18-month period for lower efficiency units to be cleared from inventory following the January 2015 change in baseline efficiency standard. Moreover, by the fourth quarter of 2015, DEC observed a decline in HVAC equipment costs of almost 10%. DEC asserted that the declining HVAC equipment costs would improve the TRC result, and that it was important to maintain the Program as HVAC represents 30-40% of the energy use of a typical residential customer. According to DEC, cancellation of the Program would inhibit the market transformation needed to bring down HVAC equipment prices, and would deter contractors from participating in the Program in the future.

The Company proposed that it file quarterly reports on customer costs, and that the Program as modified continue through March 2017, at which time it could be reevaluated. DEC also agreed with the Public Staff that an EER of 16 was appropriate as the baseline for geothermal heat pumps, that it would file its contractor (Trade Ally) agreement for referrals, that it would file the checklist to be used for the quality installation measure, and that it would adopt the Public Staff's EM&V recommendations to the extent practicable and not cost prohibitive.

Following the filing of DEC's Reply Comments, the Public Staff and Company reached agreement on a resolution to propose to the Commission. Under the agreement, which was filed on February 4, 2016, DEC and the Public Staff agreed to seek Commission approval of the modifications to the Program, as amended by the Public Staff recommendations that DEC accepted in its Reply Comments, and with the exception that if the Program does not have a projected TRC above 1.0 by March 1, 2017, then the Program will terminate effective March 31, 2017. Furthermore, if the projected TRC is below 1.0 at March 1, 2017, or if the actual TRC for 2016 and the early part of 2017 is below 1.0, the Company will not be allowed to recover incentives (i.e., portfolio performance incentive or net lost revenues) for vintage 2016 and any part of 2017.

The Public Staff presented this matter at the Commission's Regular Staff Conference on February 8, 2016, and recommended that the Commission approve the Program modifications subject to the terms of the February 4, 2016, agreement between DEC and the Public Staff.

The Commission finds and concludes that the modifications in DEC's application, as revised by the agreement filed on February 4, 2016, are reasonable and should be approved. While the conservative assumptions used in the Application project a TRC result that is not sufficient for ongoing approval of the Program under DEC's Mechanism, the Reply Comments provide a reasonable basis for projecting that the TRC will be higher in the future than originally modelled. The Company remains at risk for losing its incentives associated with the Program for the 2016 vintage year and any part of the 2017 vintage year if the actual TRC result is not above 1.0 for those periods. The Program will be terminated March 31, 2017, unless it has a projected TRC result above 1.0 by March 1, 2017.

Further, the Commission finds and concludes that the appropriate ratemaking treatment for the Program, including program costs, allocation of any common EM&V costs between Duke Energy Progress, LLC, and DEC, net lost revenues, and

performance incentives, should be determined in DEC's annual cost recovery rider approved pursuant to Commission Rule R8-69.

IT IS, THEREFORE, ORDERED as follows:

1. That the proposed modifications to the Residential HVAC Energy Efficiency – Air Conditioning Program are hereby approved pursuant to Commission Rule R8-68.

2. That the Commission shall determine the appropriate ratemaking treatment for the Residential HVAC Energy Efficiency – Air Conditioning Program, including program costs, net lost revenues, and portfolio performance incentives, in DEC's annual cost recovery rider, in accordance with G.S. 62-133.9, Commission Rule R8-69, and the Mechanism.

3. That if the Residential HVAC Energy Efficiency – Air Conditioning Program does not have a projected TRC result greater than 1.0 by March 1, 2017, the Program shall be terminated effective March 31, 2017.

4. That if the Residential HVAC Energy Efficiency – Air Conditioning Program does not have a projected TRC result greater than 1.0 by March 1, 2017, or it does not have an actual TRC for vintage year 2016 (and 2017 as applicable) greater than 1.0, DEC shall refund any vintage year 2016 and 2017 portfolio performance incentive and net lost revenues that are associated with the Program and that DEC has collected in rates.

5. That the Public Staff's recommendations regarding use of a baseline EER of 16 for geothermal heat pumps, the filing and review of the contractor referral agreement template, the filing and review of the quality installation checklist, and additional EM&V information shall be implemented to the extent practicable and not cost prohibitive.

6. That DEC shall discuss in its Collaborative meetings the recommendations from SELC and NCSEA.

7. That DEC shall file with the Commission, within 10 days following the date of this order, a revised tariff showing the effective date of the tariff and revised EER standards for geothermal heat pumps.

ISSUED BY ORDER OF THE COMMISSION.

This the 9th day of February, 2016.

NORTH CAROLINA UTILITIES COMMISSION

Paige J. Morris

Paige J. Morris, Deputy Clerk

Commissioner Lyons Gray did not participate in this decision.

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. E-7, SUB 1130

TESTIMONY OF JACK L. FLOYD
ON BEHALF OF THE PUBLIC STAFF
NORTH CAROLINA UTILITIES COMMISSION

May 23, 2017

1 Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND
2 PRESENT POSITION.

3 A. My name is Jack Floyd. My business address is 430 North Salisbury
4 Street, Dobbs Building, and Raleigh, North Carolina. I am a Utilities
5 Engineer with the Electric Division of the Public Staff, North Carolina
6 Utilities Commission.

7

8 Q. BRIEFLY STATE YOUR QUALIFICATIONS AND DUTIES.

9 A. My qualifications and duties are included in Appendix A.
10

11 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

12 A. The purpose of my testimony is to present the Public Staff's analysis
13 and recommendations with respect to the following aspects of the
14 March 8, 2017 application of Duke Energy Carolinas, LLC (DEC), for
15 approval of its demand-side management (DSM) and energy
16 efficiency (EE) cost recovery rider for 2018 (Rider 9): (1) the portfolio
17 of DSM and EE programs included in proposed Rider 9, including

1 and has indicated that it may seek to discontinue the pilot before the
2 end of the three-year period. Therefore, given the pilot status of this
3 program, I do not recommend any changes at this time. Consistent
4 with the current Mechanism, if the pilot is not developed into a cost-
5 effective program going forward, then DEC will not be able to recover
6 any bonus incentive or net lost revenues for the years the program
7 was in the pilot phase. *DEC must demonstrate that the program can*
8 *be cost-effective by the end of the pilot if it seeks to have it approved*
9 *as a fully commercialized program.*

10

11 The Non-residential Smart Saver Performance Incentive program
12 was approved in the fall of 2016 and launched in January 2017.
13 Assessing the actual cost-effectiveness of the program at this early
14 stage is difficult. By the next rider proceeding, the program will have
15 matured and then can be assessed to determine if it is cost-effective.

16

17 With respect to the Residential HVAC EE program, I believe this
18 program should either be terminated or substantially changed.

19

20 **Q. WHY ARE YOU RECOMMENDING TERMINATION OR**
21 **SUBSTANTIAL CHANGES TO THE RESIDENTIAL HVAC EE**
22 **PROGRAM?**

1 A. The Residential HVAC EE program has struggled to remain cost-
2 effective for several years because of (1) higher efficiency standards
3 mandated by the federal government, which has increased baselines
4 for efficiency, and (2) the need for large participant incentives to
5 overcome the out-of-pocket costs to participants. Even when DEC
6 used non-updated avoided cost inputs to calculate cost-
7 effectiveness as shown on Evans Exhibit 7, the program continued
8 to struggle to be cost-effective (TRC of 0.99).

9
10 The Company and the Public Staff addressed the issue of
11 underperformance and cost effectiveness of the Residential HVAC
12 EE program in a stipulation and agreement filed February 4, 2016, in
13 Docket No. E-7, Sub 1032. In its February 9, 2016 *Order on*
14 *Application For Approval of Program Modifications*, the Commission
15 approved DEC's proposed modifications to the Residential HVAC EE
16 program and granted DEC until March 1, 2017, to achieve projected
17 cost effectiveness under the TRC test. The Commission
18 subsequently granted DEC approval to continue offering the
19 Residential HVAC EE program beyond March 31, 2017, in its *Order*
20 *Approving DSM/EE Rider and Requiring Filing of Proposed*
21 *Customer Notice* in Docket No. E-7, Sub 1105.

1 One of those modifications included a new referral channel that
2 would steer customers seeking new HVAC systems to a select list of
3 vendors who had paid DEC to be on the list. These revenues from
4 vendors were intended to offset the program costs and improve cost-
5 effectiveness.

6
7 As part of my investigation in this proceeding, I reviewed several of
8 the cost-effectiveness calculations for certain measures in this
9 program to determine if the referral channel had improved the overall
10 program cost effectiveness. It appears that the referral channel did
11 improve cost-effectiveness. However, the non-referral channel
12 (participants who did not get a contractor from DEC's selected list of
13 contractors) does not appear to be cost-effective by a significant
14 amount (several TRCs scores well below 1.0). I also evaluated the
15 cost-effectiveness of a sample of referral and non-referral measures
16 to determine how updated avoided cost inputs would impact cost-
17 effectiveness. This evaluation indicated that the referral measures
18 remained cost-effective even with the *updated avoided cost inputs*.
19 Furthermore, program participation associated with the non-referral
20 channel continues to overwhelm any benefits from the referral
21 channel. In other words approximately 99% of the participation with
22 the HVAC replacement measures of the program comes through the
23 non-referral channel. Based on this information, I continue to have

1 serious doubts about the program's cost-effectiveness, unless DEC
2 can make substantial changes to improve cost-effectiveness.

4 Q. WHAT CHANGES DO YOU RECOMMEND FOR THE
5 RESIDENTIAL HVAC EE PROGRAM?

6 A. DEC has expressed a strong desire to the Public Staff to continue
7 offering a residential HVAC program. I agree that such a program is
8 a fundamental EE program for any utility's EE portfolio. Therefore, I
9 recommend that DEC either terminate the program effective March
10 31, 2018, or modify the program to transition from non-referral
11 channel measures that are not cost-effective under the TRC to be
12 more heavily focused on referred measures, as calculated for
13 purposes of preparing Evans Exhibit 7.

15 Q. DOES DEC AGREE WITH THE PUBLIC STAFF'S
16 RECOMMENDATIONS REGARDING THE THREE PROGRAMS?

17 A. DEC has indicated that it agrees with the Public Staff
18 recommendations.

19

20 EM&V

21 Q. HAVE YOU REVIEWED THE EM&V REPORTS FILED BY DUKE
22 ENERGY CAROLINAS?

1 developed strategies with respect to each of the three programs. First, with
2 respect to the Business Energy Report Pilot Program, the Company is likely to
3 file a request to terminate the program in the next few weeks. Given the
4 struggling cost effectiveness, preliminary internal savings analysis, and
5 potential vendor viability issues in the future, DEC believes that it is prudent
6 to terminate the pilot early. With respect to Witness Floyd's concerns about
7 Non-Residential Smart Saver Performance Incentive Program, the Company
8 believes that given the relatively short time the program has been in the
9 market, coupled with the great deal of heterogeneity in the type of projects
10 that can come through the program, the program needs more time before its
11 cost effectiveness scores should lead to any specific action other than ongoing
12 monitoring and reporting in the Collaborative. Finally, with respect to
13 Witness Floyd's recommendation regarding the Residential HVAC EE
14 Program, the Company is in the process of preparing a filing requesting to
15 make a number of modifications to the program to enhance its cost
16 effectiveness, including a modification designed to improve the ratio of
17 customers participating in the more cost effective referral measures.

18 **Q. PLEASE DISCUSS THE RECOMMENDATIONS MADE IN**
19 **TESTIMONY OF SACE AND NC JUSTICE CENTER WITNESS**
20 **WEISS.**

21 **A.** The Company continues to appreciate the participation and input of interested
22 external stakeholders like SACE and the NC Justice Center into DEC's
23 DSM/EE programs. The Company believes that its Collaborative meetings

NC Public Staff
Docket No. E-7 Sub 1164
NC Public Staff Data Request No. 12
2018 DSM/EE Rider (Evans Testimony)
Item No. 12-12
Page 1 of 1

DUKE ENERGY CAROLINAS, LLC

Request:

On page 11 of Witness Evans' testimony, he mentions that the Company is "actively working to evaluate programmatic changes, such as the Public Staff's recommendations to eliminate all non-referral channel measures that would offset the decline in avoided cost..." Please explain why the Company has not made the changes proposed by Public Staff witness Floyd in the last case to eliminate the non-referral channel in the Residential Smart Saver EE program. Please also provide a timeline for making these changes.

Response:

While the Company does not disagree with the changes proposed by Public Staff in the last case, Docket No. E-7 Sub 1130, regarding the elimination of the non-referral channel provided in the Residential Smart Saver EE program, the Company did have concerns regarding the broader trade ally network response to such a drastic programmatic change. As the Program's cost-effectiveness is of an ongoing concern for both the Public Staff and the Company, the Company is not adverse to adopting the Public Staff's recommendation to eliminate the non-referral channel. The Company would prefer that the Public Staff, in the context of the current proceeding, request that the Commission order the Company to make this Program change. If the Commission approves the Public Staff's request, which the Company does not plan to object to, the Company will file the changes, in the form of a compliance tariff, within 60 days of the Commission's Order.

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-7, SUB 1032

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of		
Request by Duke Energy Carolinas,	)	
LLC, for Approval of Modifications to	)	
Residential HVAC Energy Efficiency	)	ORDER APPROVING
Program - Air Conditioning, Residential	)	PROGRAM MODIFICATIONS
HVAC Energy Efficiency Program –	)	
Tune and Seal, and Residential Energy	)	
Efficiency Appliance and Devices Program	)	

BY THE COMMISSION: On July 20, 2017, Duke Energy Carolinas, LLC (DEC or Company), filed an application seeking approval of modifications to its Residential HVAC Energy Efficiency (EE) – Air Conditioning program (RHVAC EE) and its Residential EE Appliances and Devices program (REEAD). DEC is also requesting approval to eliminate the Residential HVAC EE Program – Tune and Seal (RT&S). With these modifications, DEC proposes to consolidate the surviving measures into the “Residential Smart Saver EE” Program (RSSS).

The proposed modifications to the RHVAC EE, REEAD, and RT&S programs are intended to increase the overall cost-effectiveness of the RSSS. The Company is also proposing to align the structure, measures, and incentives in the Program with a similar program offered by Duke Energy Progress, LLC's (DEP), also known as RSSS.¹

DEC's proposed modifications to the RHVAC EE program include the removal of measures that are not cost-effective and restructuring the incentives for several measures that will remain. More specifically, the modifications to the incentives proposed by DEC will: (1) eliminate the existing tiered incentive structure for air conditioning and heat pump equipment; (2) set a maximum incentive amount for certain individual measures and groups of related measures; and (3) remove the incentives for central air conditioners and heat pumps with SEER (seasonal energy efficiency ratio) of less than 15.

¹ DEP has also requested approval to make similar modifications to their Residential Home Energy Improvement Program, which upon approval would also be renamed as the RSSS. See the DEP request filed July 20, 2017, in Docket No. E-2, Sub 936.

DEC's proposed modification to the REEAD would move the heat pump water heater and the pool pump measures from the REEAD to the RSSS. The only remaining measures in the REEAD would be those associated with high efficiency lighting, electric water heater flow devices, and other custom equipment as determined on a case by case basis.

DEC's proposed modifications to the RT&S would (1) eliminate those related to HVAC tune ups and duct insulation; (2) move the attic insulation and seal and duct sealing measures to the RSSS; and (3) terminate the RT&S.

With the exception of these removed measures and the measures retained in the REEAD program, the RSSS will incorporate EE measures currently included in the RHVAC EE, REEAD, and RT&S programs. DEC's proposed tariff for the RSSS groups certain measures that are inter-related. For example, the HVAC equipment measures offered in the new RSSS will include central air conditioners, heat pumps, quality equipment installation, and smart thermostats. Thermal boundary measures offered will include attic insulation and air sealing in attic spaces, exterior walls and subfloors. HVAC duct improvements offered will include sealing, repairing, and replacing ductwork to improve air flow. No changes are proposed to the pool pump and heat pump water heater measures that will be moved to the RSSS.

DEC's application indicates that with these proposed modifications, the newly named RSSS program and the REEAD would be cost-effective on a going-forward basis under the Total Resource Cost Test (TRC), the Utility Cost Test (UCT), and the Participant Test.

DEC's application requests that the Commission: (1) approve the RSSS; (2) approve the modifications to the REEAD; (3) discontinue the RT&S; (4) find that the RSSS is a "new" EE program pursuant to Commission Rule R8-69; (5) find that the cost of the RSSS is eligible for cost recovery; and (6) approve the proposed utility incentives for inclusion in the annual DSM/EE rider.

To date, no other party has intervened or filed comments in this docket regarding the proposed modifications to the Program.

The Public Staff presented this matter at the Commission's Regular Staff Conference on September 11, 2017. The Public Staff stated that it had reviewed DEC's proposed modifications, and that the RSSS appeared to be cost-effective. The Public Staff also offered comments regarding the cost-effectiveness of the RSSS, the modifications to the measures offered under the RSSS, the incentive structure, and the proposed tariff for the RSSS. More specifically, the Public Staff stated that:

1. The RHVAC EE and REEAD were originally approved February 26, 2009, as part of the Save A Watt (SAW) portfolio in Docket No. E-7, Sub 831. The RT&S was also originally approved in the SAW portfolio August 28, 2012. Each of these programs were carried forward into the current portfolio that was approved October 29, 2013 in Docket No. E-7, Sub 1032. The RHVAC EE was later modified February 9, 2016 to add the referral channel and maintain cost-effectiveness. DEC also added a referral channel to guide interested customers to one or more DEC-approved HVAC contractors who have paid DEC a fee to be on the referral list.

2. Many of the same measures that were part of the RHVAC EE Program will continue to be offered, including incentives for measures installed outside of the referral channel. Our review of the modeling information provided to the Public Staff continues to suggest that measures installed outside the referral channel are not cost-effective.

3. DEC indicated to the Public Staff that the Company will continue to provide incentives for measures installed outside of the referral channel because of concerns that converting the RSSS to a "referral only" program would create a "pay for play" environment. DEP further indicated that it believes that the proposed modifications to the RSSS will increase participation in the referral-based delivery channel.

4. DEC has indicated to the Public Staff that it expects that by removing several measures that are not cost-effective, and incorporating other measures that are cost-effective, its proposed modifications to the RSSS will improve the overall cost-effectiveness of the RSSS.

5. DEC further indicated that the Company continues to observe a decrease in the out-of-pocket participant costs, stating that 2017 has seen an average decrease of 13%.

6. The TRC for the RSSS is 1.08, approximately 8% greater than the TRC of 0.99 filed as Evans Exhibit 7 in the Company's 2017 DSM/EE rider proceeding in Docket No. E-7, Sub 1130, for the RHVAC EE program.²

7. DEC's proposed modifications will result in the RSSS becoming substantially similar to DEP's Residential Smart Saver EE Program.

² Evans Exhibit 7 in Docket No. E-7, Sub 1130, used avoided capacity costs from Docket No. E-100, Sub 136, and avoided energy costs from the Company's 2012 Integrated Resource Plan. The calculations for the Application used the 2014 approved avoided capacity and energy costs from Docket No. E-100, Sub 140, consistent with the agreement reached between the Company and Public Staff in the Sub 1130 proceeding.

8. DEC's proposed modifications for the RSSS will also allow the Company greater flexibility in how it pays incentives to customers. The Company's proposal allows the Company to pay incentives up to a maximum amount commensurate with the measures installed. The Public Staff believes this structure is consistent with the flexibility guidelines that were approved February 6, 2012, in Docket No. E-7, Sub 831, and incorporated into the cost recovery mechanism approved October 29, 2013, in Docket No. E-7, Sub 1032. Any change to the maximum incentive amounts would require Commission approval.

The Public Staff stated that the RSSS program overall appeared to be cost-effective. However, the Public Staff also stated its concern that measures offered through the non-referral channel are not cost-effective. While the participant costs continue to decline, the costs have not declined enough to make the non-referral channel measures cost-effective. The Public Staff also acknowledged the Company's concerns related to the perception of discrimination if the RSSS is considered a "pay for play" program by HVAC contractors. As long as the Company continues to offer measures through the non-referral channel, RSSS will continue to be marginally cost-effective.

The Public Staff concluded by recommending that the Commission find that the RSSS continues to meet the requirements of a new EE program pursuant to Commission Rule R8-69, and that the appropriate recovery of program costs, net lost revenues, and performance incentives associated with the RSSS should be determined in the annual DSM/EE rider proceeding consistent with G.S. 62-133.9, Commission Rule R8-69, and the current DSM/EE cost recovery mechanism. The Public Staff also recommended that DEC report in its annual DSM/EE rider proceedings the test year incremental participation for each measure using both delivery channels.

Based upon the foregoing, the Commission finds and concludes that the proposed modifications to the Residential HVAC Energy Efficiency Program - Air Conditioning, Residential HVAC Energy Efficiency Program - Tune and Seal, and Residential Energy Efficiency Appliance and Devices Program should be approved as recommended by the Public Staff, and that the appropriate ratemaking treatment for the Residential Service - Smart Saver Energy Efficiency Program including program costs, net lost revenues, and performance incentives, should be determined in DEC's annual cost recovery rider approved pursuant to Commission Rule R8-69.

IT IS, THEREFORE, ORDERED as follows:

1. That the Residential HVAC Energy Efficiency Program - Air Conditioning and the Residential HVAC Energy Efficiency Program - Tune and Seal, and will be replaced with the "Residential Service - Smart Saver Energy Efficiency Program."

2. That the Residential HVAC Energy Efficiency Program - Tune and Seal is hereby canceled effective the date of this Order.

3. That the modifications to the Residential Energy Efficiency Appliance and Devices Program are hereby approved.

4. That the Residential Service – Smart \$aver Energy Efficiency Program continues to meet the requirements of a “new” energy efficiency program, and that proposed modifications included in DEC’s Application now applicable to the Residential Service – Smart \$aver Energy Efficiency Program are hereby approved pursuant to Commission Rule R8-68;

5. That the Commission shall determine the appropriate ratemaking treatment for the Residential Service – Smart \$aver Energy Efficiency Program, including program costs, net lost revenues, and portfolio performance incentives, in DEC’s annual cost recovery rider, in accordance with G.S. 62-133.9, Commission Rule R8-69, and the Mechanism;

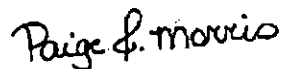
6. That in the annual DSM/EE rider proceedings, DEC shall provide test year incremental participation for each measure using delivery by both channels; and,

7. That DEC shall file with the Commission, within 10 days following the date of this order, revised tariffs for the Residential Service – Smart \$aver Energy Efficiency Program and the Residential Energy Efficiency Appliance and Devices Program showing the effective date of each tariff.

ISSUED BY ORDER OF THE COMMISSION.

This the 11th day of September, 2017.

NORTH CAROLINA UTILITIES COMMISSION



Paige J. Morris, Deputy Clerk

Commissioner Lyons Gray did not participate in this decision.

I/A

Residential Billing Factors

Residential Billing Factor for Rider 10 True-up (EMF) Components

Line		Adjusted
1	Year 2014 EE/DSM True-Up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 1 Line 15 501,324
2	Year 2015 EE/DSM True-Up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 2 Line 15 (1,014,271)
3	Year 2016 EE/DSM True-Up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3 Line 15 (2,560,305)
4	Year 2017 EE/DSM True-Up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 4 Line 15 26,865,491
5	Total True-up (EMF) Revenue Requirement	Sum Lines 1-4 \$ 23,792,240
6	Projected NC Residential Sales (kWh) for rate period	Miller Exhibit 6 pg. 1, Line 1 21,806,637,265
7	EE/DSM Revenue Requirement EMF Residential Rider EE (cents per kWh)	Line 5 / Line 6 * 100 0.1091

Residential Billing Factor for Rider 10 Prospective Components

8	Vintage 2017 Total EE/DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 4, Line 1 8,904,587
9	Vintage 2018 Total EE/DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 5, Line 1 6,294,025
10	Vintage 2019 Total EE/DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 6, Line 11 77,019,869
11	Total Prospective Revenue Requirement	Sum Lines 8-11 \$ 92,218,481
12	Projected NC Residential Sales (kWh) for rate period	Miller Exhibit 6 pg. 1, Line 1 21,806,637,265
13	EE/DSM Revenue Requirement Prospective Residential Rider EE (cents per kWh)	Line 12 / Line 13 * 100 0.4229

Total Revenue Requirements in Rider 10 from Residential Customers

14	Total True-up (EMF) Revenue Requirement	Line 5 \$ 23,792,240
15	Total Prospective Revenue Requirement	Line 12 92,218,481
16	Total EE/DSM Revenue Requirement for Residential Rider EE	Line 15 + Line 16 \$ 116,010,721
17	Total EE/DSM Revenue Requirement for Residential Rider EE (cents per kWh)	Line 7 + Line 14 0.5320

Non-Residential Billing Factors for Rider 10 True-up (EMF) Components

18	Vintage Year 2014 EE True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 1, Line 25 \$ (1,154,814)
19	Projected Year 2014 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 4 18,883,365,623
20	EE Revenue Requirement Year 2014 EMF Non-Residential Rider EE (cents per kWh)	Line 19/Line 20 * 100 (0.0061)
21	Vintage Year 2014 DSM True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 1, Line 35 \$ (39,246)
22	Projected Year 2014 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 5 18,694,210,397
23	DSM Revenue Requirement Year 2014 EMF Non-Residential Rider EE (cents per kWh)	Line 22/Line 23 * 100 (0.0002)
24	Vintage Year 2015 EE True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 2, Line 25 \$ 456,319
25	Projected Year 2015 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 6 18,763,045,012
26	EE Revenue Requirement Year 2015 EMF Non-Residential Rider EE (cents per kWh)	Line 25/Line 26 * 100 0.0024
27	Vintage Year 2015 DSM True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 2, Line 35 \$ (451,445)
28	Projected Year 2015 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 7 18,490,935,206
29	DSM Revenue Requirement Year 2015 EMF Non-Residential Rider EE (cents per kWh)	Line 28/Line 29 * 100 (0.0024)
30	Vintage Year 2016 EE True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3, Line 35 \$ (2,329,721)
31	Projected Year 2016 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 8 18,489,604,035
32	EE Revenue Requirement Year 2016 EMF Non-Residential Rider EE (cents per kWh)	Line 31/Line 32 * 100 (0.0126)
33	Vintage Year 2016 DSM True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3, Line 35 \$ (267,721)
34	Projected Year 2016 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 9 18,210,209,069
35	DSM Revenue Requirement Year 2016 EMF Non-Residential Rider EE (cents per kWh)	Line 34/Line 35 * 100 (0.0015)

REVISED

36	Vintage Year 2017 EE True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3, Line 35	\$	53,163,097
37	Projected Year 2017 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 8		18,183,662,735
38	EE Revenue Requirement Year 2017 EMF Non-Residential Rider EE (cents per kWh)	Line 37/Line 38 * 100		0.2924
39	Vintage Year 2017 DSM True-up (EMF) Revenue Requirement	Miller Exhibit 2 pg. 3, Line 35	\$	86,311
40	Projected Year 2017 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 9		18,177,460,568
41	DSM Revenue Requirement Year 2017 EMF Non-Residential Rider EE (cents per kWh)	Line 40/Line 41 * 100		0.0005

Non-Residential Billing Factors for Rider 10 Prospective Components

42	Vintage Year 2017 EE Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 4, Line 18	\$	14,570,381
43	Projected Program Year 2017 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 10		18,183,662,735
44	EE Revenue Requirement Vintage 2017 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 42/Line 43 * 100		0.0801
45	Vintage Year 2018 EE Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 5, Line 25	\$	12,285,044
46	Projected Vintage 2018 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 12		17,670,299,445
47	EE Revenue Requirement Vintage 2018 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 45/Line 46 * 100		0.0695
48	Vintage Year 2018 DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 5, Line 25	\$	534,763
49	Projected Vintage 2018 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 12		18,078,506,705
50	DSM Revenue Requirement Vintage 2018 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 48/Line 49 * 100		0.0030
51	Vintage Year 2019 EE Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 6, Line 25	\$	55,797,199
52	Projected Vintage 2019 EE Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 13		17,670,299,445
53	EE Revenue Requirement Vintage 2019 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 51/Line 52 * 100		0.3158
54	Vintage Year 2019 DSM Prospective Amounts Revenue Requirement	Miller Exhibit 2 pg. 6, Line 25	\$	15,847,512
55	Projected Vintage 2019 DSM Participants NC Non-Residential Sales (kwh) for rate period	Miller Exhibit 6 pg. 1, Line 13		18,078,506,705
56	DSM Revenue Requirement Vintage 2019 Prospective Component for Non-Residential Rider EE (cents per kWh)	Line 54/Line 55 * 100		0.0877
	Total EMF Rate			0.2725
	Total Prospective Rate			0.5561

Total Revenue Requirements in Rider 10 from Non-Residential Customers

57	Vintage Year 2014 EE True-up (EMF) Revenue Requirement	Line 18		(1,154,814)
58	Vintage Year 2014 DSM True-up (EMF) Revenue Requirement	Line 21		(39,246)
59	Vintage Year 2015 EE True-up (EMF) Revenue Requirement	Line 24		456,319
60	Vintage Year 2015 DSM True-up (EMF) Revenue Requirement	Line 27		(451,445)
61	Vintage Year 2016 EE True-up (EMF) Revenue Requirement	Line 30		(2,329,721)
62	Vintage Year 2016 DSM True-up (EMF) Revenue Requirement	Line 33		(267,721)
63	Vintage Year 2017 EE True-up (EMF) Revenue Requirement	Line 36		53,163,097
64	Vintage Year 2017 DSM True-up (EMF) Revenue Requirement	Line 39		86,311
65	Vintage Year 2017 EE Prospective Amounts Revenue Requirement	Line 42		14,570,381
66	Vintage Year 2018 EE Prospective Amounts Revenue Requirement	Line 45		12,285,044
67	Vintage Year 2018 DSM Prospective Amounts Revenue Requirement	Line 48		534,763
67	Vintage Year 2019 EE Prospective Amounts Revenue Requirement	Line 51		55,797,199
68	Vintage Year 2019 DSM Prospective Amounts Revenue Requirement	Line 54		15,847,512
	Total Non-Residential Revenue Requirement in Rider 10	Sum (Lines 57-68)	\$	148,497,678

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
True up Year 1, 2, 3 and 4 for Vintage Year 2014

I/A

RESIDENTIAL Energy Efficiency Programs

Line	Reference
1 Residential EE Program Cost	Evans Exhibit 1 pg. 1, Line 10 * NC Alloc. Factor
2 Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 1, Line 10 * NC Alloc. Factor
3 Return on undercollection of Residential EE Program Costs	Miller Exhibit 3 pg. 1
4 Total EE Program Cost and Incentive Components	Line 1 + Line 2 + Line 3
5 Residential DSM Program Cost	Evans Exhibit 1 pg. 1, Line 11 * NC Alloc. Factor
6 Residential DSM Earned Utility Incentive	Evans Exhibit 1 pg. 1, Line 11 * NC Alloc. Factor
7 Return on overcollection of Residential DSM Program Costs	Miller Exhibit 3 pg. 2
8 Total DSM Program Cost and Incentive Components	Line 5 + Line 6 + Line 7
9 Total EE/DSM Program Cost and Incentive Components	Line 4 + Line 8
10 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7
11 Total EE/DSM Program Cost and Incentive Revenue Requirement	Line 9 + Line 10
12 Residential Net Lost Revenues	Evans Exhibit 2 pg. 1
13 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12
14 Total Collected for Vintage Year 2014 (through estimated Rider 9)	Miller Exhibit 4, Line 1
15 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12

E-7 Sub 1031	E-7 Sub 1050	E-7 1073	E-7 Sub 1073	E-7 Sub 1105	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1164	
Rider 5 Original Estimate	Rider 6 Year 2 Lost Revenue Estimate	Rider 7 - True up of Year 1	Rider 7 - Estimate of Year 3 Lost Revenue	Rider 8 - True up of Lost Revenues and EM&V	Rider 8 - Estimate of Year 4 Lost Revenues	Rider 9 True up	Rider 10 True up	Year 2014
\$ 29,754,660		\$ (1,844,170)		\$ 1		\$ (0)	\$ -	\$ 27,910,491
2,242,156		2,715,537		88,645		274	(273)	5,046,339
53,935		53,935		140,851		71,702	(706)	265,782
31,996,816		925,302		229,497		71,976	(979)	33,222,612
13,143,935		(2,535,104)		(0)		-	-	10,608,831
3,240,520		(12,767)		(25,251)		(0)	-	3,202,502
		(69,597)		(136,468)		(64,670)	10,071	(260,664)
16,384,455		(2,617,468)		(161,719)		(64,670)	10,071	13,550,668
48,381,271		(1,692,166)		67,778		7,306	9,091	46,773,280
1,017,953		1,001,442		1,001,402		1,001,402	1,001,402	
49,249,860		(1,694,606)		67,873		7,316	9,104	47,639,547
8,435,982	3,810,949	3,065,327	9,895,892	6,287,758	5,005,380	217,145	207,005	36,925,438
57,685,842	3,810,949	1,370,721	9,895,892	6,355,631	5,005,380	224,462	216,109	84,564,965
								84,063,661
								\$ 501,324

See Miller Exhibit A for rate

NON-RESIDENTIAL Energy Efficiency Programs

Line	Reference
16 Non-Residential EE Program Cost	Evans Exhibit 1 pg. 1, Line 24 * NC Alloc. Factor
17 Non-Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 1, Line 24 * NC Alloc. Factor
18 Return on undercollection of Non-Residential EE Program Costs	Miller Exhibit 3 page 3A
19 Total EE Program Cost and Incentive Components	Line 16 + Line 17 + Line 18
20 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7
21 Total Non-Residential EE Program Cost and Incentive Revenue Requirements	Line 19 + Line 20
22 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 1
23 Total Non-Residential EE Revenue Requirement	Line 21 + Line 22
24 Total Collected for Year 2014 (through Estimated Rider 9)	Miller Exhibit 4, Line 7
25 Non-Residential EE Revenue Requirement True-Up Amount	Line 23 - Line 24
26 Projected NC Residential Sales (kWh)	Miller Exhibit 6, pg. 1, Line 4
27 NC Non-Residential EE billing factor (Cents/kWh)	Line 25/Line 26*100

E-7 Sub 1031	E-7 Sub 1050	E-7 1073	E-7 Sub 1073	E-7 Sub 1105	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1164	
Rider 5 Original Estimate	Rider 6 Year 2 Lost Revenue Estimate	Rider 7 - True up of Year 1	Rider 7 - Estimate of Year 3 Lost Revenue	Rider 8 - True up of Lost Revenues & EM&V	Rider 8 - Estimate of Year 4 Lost Revenues	Rider 9 True up	Rider 10 True up	Year 2014
16,206,358		(1,398,648)		-		1	-	14,807,711
5,782,942		2,021,277		35,872		45,754	(121,883)	7,763,962
		94,850		130,948		73,379	(7,112)	292,065
21,989,300		717,479		166,820		119,134	(128,995)	22,863,738
1,017,953		1,001,442		1,001,402		1,001,402	1,001,402	
22,384,074		718,514		167,054		119,301	(129,176)	23,259,766
1,831,641	4,837,353	1,222,389	6,094,150	1,203,734	3,150,271	(853,990)	(1,483,604)	16,001,944
24,215,715	4,837,353	1,940,903	6,094,150	1,370,788	3,150,271	(734,689)	(1,612,780)	39,261,710
								40,416,525
								(1,154,814)
								18,883,365,623
								(0.0061)

DSM Programs

Line	Reference
28 Non-Residential DSM Program Cost	Evans Exhibit 1, pg. 1 Line 25 * NC Alloc. Factor
29 Non-Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 1 Line 25 * NC Alloc. Factor
30 Return on overcollection of Non-Residential DSM Program Costs	Miller Exhibit 3 page 4
31 Total Non-Residential DSM Program Cost and Incentive Components	Line 28 + Line 29 + Line 30
32 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7
33 Total Non-Residential DSM Revenue Requirement	Line 31 + Line 32
34 Total Collected for Year 2014 (through Estimated Rider 9)	Miller Exhibit 4 Line 12
35 Non-Residential DSM Revenue Requirement True up Amount	Line 33- Line 34
36 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6 pg. 2, Line 5
37 NC Non-Residential DSM billing factor	Line 35/Line 36*100

E-7 Sub 1031	E-7 1073	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1164	
Rider 5 Original Estimate	Rider 7 - True up of Year 1	Rider 8 - True up	Rider 9 True up	Rider 10 True up	Year 2014
15,046,160	(2,195,319)	(0)	-	-	12,850,841
3,709,497	200,391	(30,588)	-	-	3,879,300
	(19,939)	(82,394)	(52,597)	(18,476)	(173,406)
18,755,657	(2,014,867)	(112,982)	(52,597)	(18,476)	16,556,735
1,017,953	1,001,442	1,001,402	1,001,402	1,001,402	
19,092,377	(2,017,772)	(113,141)	(52,671)	(18,502)	16,890,292
					16,929,538
					(39,246)
					18,694,210,397
					(0.0002)

** Actual regulatory fee rate in effect in year of collection. May differ from original filed estimates.

RESIDENTIAL Energy Efficiency Programs

Line

Reference

- 1 Residential EE Program Cost
- 2 Residential EE Earned Utility Incentive
- 3 Return on undercollection of Residential EE Program Costs
- 4 Total EE Program Cost and Incentive Components
- 5 Residential DSM Program Cost
- 6 Residential DSM Earned Utility Incentive
- 7 Return on undercollection of Residential DSM Program Costs
- 8 Total DSM Program Cost and Incentive Components
- 9 Total EE/DSM Program Cost and Incentive Components
- 10 Revenue-related taxes and regulatory fees factor **
- 11 Total EE/DSM Program Cost and Incentive Revenue Requirement
- 12 Residential Net Lost Revenues
- 13 Total Residential EE/DSM Revenue Requirement
- 14 Total Collected for Vintage Year 2015 (through estimated Rider 9)
- 15 Total Residential EE/DSM Revenue Requirement

Evans Exhibit 1 pg. 2, Line 10 * NC Alloc. Factor
Evans Exhibit 1 pg. 2, Line 10 * NC Alloc. Factor
Miller Exhibit 3 pg 5
Line 1 + Line 2 + Line 3
Evans Exhibit 1 pg. 2, Line 11 * NC Alloc. Factor
Evans Exhibit 1 pg. 2, Line 11 * NC Alloc. Factor
Miller Exhibit 3 pg 6
Line 5 + Line 6 + Line 7
Line 4 + Line 8
Miller Exhibit 2, pg. 7
Line 9 * Line 10
Evans Exhibit 2 pg. 1
Line 11 + Line 12
Miller Exhibit 4 Line 2
Line 11 + Line 12

E-7 Sub 1050	E-7 Sub 1073	E-7 Sub 1105	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1130	E-7 Sub 1164	
Rider 6 Original Estimate	Rider 7 Year 2 Lost Revenues	Rider 8 True up of Year 1	Rider 8 Year 3 Lost Revenues	Rider 9 True up of Lost Revenues & EMSV	Rider 9 Year 4 LR Estimate	Rider 10 True up	Year 2015 Year 1
\$ 80,685,449		\$ (2,726,355)		\$ -		\$ -	\$ 27,959,114
2,374,641		2,431,522		125,671		(0)	4,932,234
		49,064		77,792		35,939	162,795
33,060,090		(245,348)		203,453		35,938	33,054,143
12,532,432		(2,137,589)		(1,252)		(0)	10,393,591
3,275,217		(676,007)		(12,280)		(532)	2,586,398
		(10,785)		23,451		11,838	24,503
15,827,649		(2,824,381)		9,919		11,305	13,004,492
48,867,736		(3,065,730)		213,382		47,244	48,058,535
1,001,417		1,001,402		1,001,402		1,001,402	
48,936,585		(3,074,034)		213,681		47,310	48,123,942
9,169,840	4,071,955	5,563,184	8,090,365	4,181,235	3,431,636	(1,336,510)	35,181,702
58,106,825	4,071,955	2,489,151	8,090,365	4,404,913	3,431,636	(1,289,200)	79,325,645
							80,319,916
							\$ (1,014,271)

See Miller Exhibit A for rate

NON-RESIDENTIAL Energy Efficiency Programs

- 16 Non-Residential EE Program Cost
- 17 Non-Residential EE Earned Utility Incentive
- 18 Return on undercollection of Non-Residential EE Program Costs
- 19 Total EE Program Cost and Incentive Components
- 20 Revenue-related taxes and regulatory fees factor
- 21 Total Non-Residential EE Program Cost and Incentive Revenue Requirements
- 22 Non-Residential Net Lost Revenues
- 23 Total Non-Residential EE Revenue Requirement
- 24 Total Collected for Year 2015 (through estimated Rider 9)
- 25 Non-Residential EE Revenue Requirement
- 26 Projected NC Residential Sales (kWh)
- 27 NC Non-Residential EE billing factor (Cents/kWh)

Reference

Evans Exhibit 1 pg. 2, Line 24 * NC Alloc. Factor
Evans Exhibit 1 pg. 2, Line 24 * NC Alloc. Factor
Miller Exhibit 3 page 7
Line 16 + Line 17 + Line 18
Miller Exhibit 2, pg. 7
Line 19 + Line 20
Evans Exhibit 2 pg. 4
Line 21 + Line 22
Miller Exhibit 4 Line 6
Line 23 + Line 24
Miller Exhibit 6, pg. 2, Line 6
Line 25/Line 26*100

E-7 Sub 1050	E-7 Sub 1073	E-7 Sub 1105	E-7 Sub 1105	E-7 Sub 1130	E-7 Sub 1130	E-7 Sub 1164	
Rider 6 Original Estimate	Rider 7 Year 2 Lost Revenues	Rider 8 True up of Year 1	Rider 8 Year 3 Lost Revenues	Rider 9 True up of Lost Revenues & EMSV	Year 2015 Year 4 LR Estimate	Rider 10 True up	Year 2015 Year 1
17,348,807		11,904,051		0		-	29,252,858
6,214,226		3,351,028		846,899		(594,998)	9,817,155
		457,891		838,799		448,315	1,744,505
23,563,033		15,712,970		1,685,198		(146,683)	40,814,518
1,001,417		1,001,402		1,001,402		1,001,402	
23,563,422		15,735,000		1,687,561		(146,885)	40,872,094
2,523,480	8,194,008	2,547,914	9,483,428	2,426,543	4,183,188	(3,671,147)	25,687,409
26,119,902	8,194,008	18,282,914	9,483,428	4,114,104	4,183,188	(3,818,096)	66,558,503
							66,103,194
							456,319
							18,763,045,012
							0.0024

DSM Programs

- 28 Non-Residential DSM Program Cost
- 29 Non-Residential DSM Earned Utility Incentive
- 30 Return on overcollection of Non-Residential DSM Program Costs
- 31 Total Non-Residential DSM Program Cost and Incentive Components
- 32 Revenue-related taxes and regulatory fees factor
- 33 Total Non-Residential DSM Revenue Requirement
- 34 Total Revenue Collected for DSM Programs Year 2015 (through estimated Rider 9)
- 35 Non-Residential EE Revenue Requirement True-up Amount
- 36 Projected NC Non-Residential Sales (kWh)
- 37 NC Non-Residential DSM billing factor

Reference

Evans Exhibit 1, pg. 2 Line 25 * NC Alloc. Factor
Evans Exhibit 1, pg. 2 Line 25 * NC Alloc. Factor
Miller Exhibit 3 page 8
Line 28 + Line 29 + Line 30
Miller Exhibit 2, pg. 7
Line 31 * Line 32
Miller Exhibit 4 Line 10
Line 33- Line 34
Miller Exhibit 6 pg. 1, Line 7
Line 35/Line 36*100

E-7 Sub 1050	E-7 Sub 1005	E-7 Sub 1130	E-7 Sub 1164	
Rider 6 Original Estimate	Rider 8 Original True Up	Rider 9 True Up	Rider 10 True Up	Year 2015 Year 1
16,499,488	(2,925,873)	(1,635)		13,565,981
4,310,397	(917,841)	(16,029)	(693)	8,375,833
	(107,297)	(203,069)	(128,531)	(438,897)
20,809,885	(3,951,011)	(220,733)	(129,225)	16,502,917
1,001,417	1,001,402	1,001,402	1,001,402	
20,833,364	(3,956,550)	(221,042)	(129,406)	16,526,366
				16,977,811
				(451,445)
				18,490,935,206
				(0.0024)

** Actual regulatory fee rate in effect in year of collection. May differ from original filed estimates.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
True Up of Year 1 and 2 for Vintage Year 2016

RESIDENTIAL Energy Efficiency Programs

Line	Reference	E-7 Sub 1073 Rider 7 Original Estimate	E-7 Sub 1105 Rider 8 Year 2 Lost Revenues	E-7 Sub 1130 Rider 9 True up	E-7 Sub 1130 Year 2016 Yr 3 LR Estimate	E-7 Sub 1164 Rider 10 True up	Year 2016 Year 1
1 Residential EE Program Cost	Evans Exhibit 1 pg. 3, Line 10 * NC Alloc. Factor	\$ 31,056,079		\$ 8,965,024		\$ (2)	\$ 40,021,101
2 Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 3, Line 10 * NC Alloc. Factor	2,392,652		4,361,799		(52,098)	6,702,353
3 Return on undercollection of Residential EE Program Costs	Miller Exhibit 3 pg. 5			272,476		710,786	983,262
4 Total EE Program Cost and Incentive Components	Line 1 + Line 2 + Line 3	33,448,731		13,599,299		658,686	47,706,716
5 Residential DSM Program Cost	Evans Exhibit 1 pg. 3, Line 11 * NC Alloc. Factor	10,613,016		(1,012,441)		0	9,600,575
6 Residential DSM Earned Utility Incentive	Evans Exhibit 1 pg. 3, Line 11 * NC Alloc. Factor	2,887,418		(129,612)		(27,890)	2,729,916
7 Return on overcollection of Residential DSM Program Costs	Miller Exhibit 3 pg. 6			(25,322)		(46,199)	(72,521)
8 Total DSM Program Cost and Incentive Components	Line 5 + Line 6 + Line 7	13,500,434		(1,168,375)		(74,089)	12,257,971
9 Total EE/DSM Program Cost and Incentive Components	Line 4 + Line 8	46,949,165		12,430,924		584,598	59,664,687
10 Revenue-related taxes and regulatory fees factor **	Miller Exhibit 2, pg. 7	1,001,442		1,001,402		1,001,402	
11 Total EE/DSM Program Cost and Incentive Revenue Requirement	Line 9 + Line 10	47,016,866		12,448,352		585,417	60,050,635
12 Residential Net Lost Revenues	Evans Exhibit 2 pg. 4	11,873,767	5,723,916	4,795,335	7,765,323	(9,299,616)	26,838,749
13 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12	58,890,633	5,723,916	17,243,711	7,765,323	(2,714,199)	86,909,384
14 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 2						89,469,689
15 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12						\$ (2,560,305)

See Miller Exhibit A for rate

NON-RESIDENTIAL Energy Efficiency Programs

Line	Reference	E-7 Sub 1073 Rider 7 Original Estimate	E-7 Sub 1105 Rider 8 Year 2 Lost Revenues	E-7 Sub 1130 True up	E-7 Sub 1130 Year 2016 Yr 3 LR Estimate	E-7 Sub 1164 Rider 10 True up	Year 2016 Year 1
16 Non-Residential EE Program Cost	Evans Exhibit 1 pg. 3, Line 25 * NC Alloc. Factor	86,494,611		13,515,376		1	50,009,988
17 Non-Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 3, Line 25 * NC Alloc. Factor	10,105,721		4,261,607		(353,358)	14,013,960
18 Return on undercollection of Non-Residential EE Program Costs	Miller Exhibit 3 page 7			378,293		1,051,375	1,429,668
19 Total EE Program Cost and Incentive Components	Line 16 + Line 17 + Line 18	46,600,332		18,155,276		698,008	65,453,616
20 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1,001,442		1,001,402		1,001,402	
21 Total Non-Residential EE Program Cost and Incentive Revenue Requirements	Line 19 + Line 20	46,667,590		18,180,730		698,897	65,547,246
22 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 4	4,745,315	8,309,444	2,524,047	13,375,187	(4,085,026)	24,869,967
23 Total Non-Residential EE Revenue Requirement	Line 21 + Line 22	51,412,845	8,309,444	20,704,776	13,375,187	(3,386,039)	90,416,213
24 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 6						92,745,934
25 Non-Residential EE Revenue Requirement	Line 23 + Line 24						(2,929,721)
26 Projected NC Residential Sales (KWh)	Miller Exhibit 6, pg. 1, Line 8						18,489,609,035
27 NC Non-Residential EE billing factor (Cents/kWh)	Line 25/Line 26*100						(0.0126)

DSM Programs

Line	Reference	E-7 Sub 1073 Rider 7 Original Estimate	E-7 Sub 1130 Rider 9 True up	E-7 Sub 1164 Rider 10 True up	Year 2016 Year 1
28 Non-Residential DSM Program Cost	Evans Exhibit 1, pg. 3 Line 26 * NC Alloc. Factor	12,855,910	(1,261,413)	0	11,594,497
29 Non-Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 3 Line 26 * NC Alloc. Factor	3,497,628	(167,059)	(33,683)	3,298,886
30 Return on undercollection of Non-Residential DSM Program Costs	Miller Exhibit 3 page 8		1,759	3,420	5,179
31 Total Non-Residential DSM Program Cost and Incentive Components	Line 28 + Line 29 + Line 30	16,353,538	(1,426,713)	(30,263)	14,896,562
32 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1,001,442	1,001,402	1,001,402	
33 Total Non-Residential DSM Revenue Requirement	Line 31 + Line 32	16,377,120	(1,428,718)	(30,303)	14,918,102
34 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 10				15,185,823
35 Non-Residential EE Revenue Requirement True-up Amount	Line 33 - Line 34				(267,721)
36 Projected NC Non-Residential Sales (KWh)	Miller Exhibit 6 pg. 1, Line 9				18,210,209,063
37 NC Non-Residential DSM billing factor	Line 35/Line 36*100				(0.0015)

* Year 4 Projected Lost Revenue is not being requested in this filing because lost revenue through the test period of Docket E7 Sub XXXX was requested as part of base rates.

** Actual regulatory fee rate in effect in year of collection. May differ from original filed estimates.

RESIDENTIAL Energy Efficiency Programs

Line	Reference	Year 2017 Yr 3 LR Estimate
1 Residential EE Program Cost	Evans Exhibit 1 pg. 4, Line 10 * NC Alloc. Factor	
2 Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 4, Line 10 * NC Alloc. Factor	
3 Return on undercollection of Residential EE Program Costs	Miller Exhibit 3 pg 5	
4 Total EE Program Cost and Incentive Components	Line 1 + Line 2 + Line 3	
5 Residential DSM Program Cost	Evans Exhibit 1 pg. 4, Line 11 * NC Alloc. Factor	
6 Residential DSM Earned Utility Incentive	Evans Exhibit 1 pg. 4, Line 11 * NC Alloc. Factor	
7 Return on undercollection of Residential DSM Program Costs	Miller Exhibit 3 pg 6	
8 Total DSM Program Cost and Incentive Components	Line 5 + Line 6 + Line 7	
9 Total EE/DSM Program Cost and Incentive Components	Line 4 + Line 8	
10 Revenue-related taxes and regulatory fees factor **	Miller Exhibit 2, pg. 7	
11 Total EE/DSM Program Cost and Incentive Revenue Requirement	Line 9 * Line 10	
12 Residential Net Lost Revenues	Evans Exhibit 2 pg. 2	\$ 8,904,587
13 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12	8,904,587
14 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 2	
15 Total Residential EE/DSM Revenue Requirement	Line 11 + Line 12	\$ 8,904,587

E-7 Sub 1105 Rider 8 Year 1 Estimate	E-7 Sub 1130 Year 2017 Yr 2 LR Estimate	E-7 Sub 1164 Rider 10 True up	Year 2017 Year 1
\$ 33,488,974		\$ 13,998,885	\$ 47,487,859
4,149,244		4,340,033	8,489,277
		522,611	522,611
37,638,218		18,661,529	56,499,747
10,258,751		(176,455)	10,082,296
2,837,134		89,061	2,926,195
		15,015	15,015
13,095,885		(72,379)	13,023,506
50,794,103		18,789,151	69,523,254
1,001,482		1,001,402	
50,805,291		18,815,499	69,624,784
12,699,119	4,202,002	6,456,129	23,357,250
63,508,411	4,202,002	25,271,622	92,982,034
			66,116,542
			\$ 26,865,491

See Miller Exhibit A for rate

NON-RESIDENTIAL Energy Efficiency Programs

Line	Reference	Year 2017 Yr 3 LR Estimate
16 Non-Residential EE Program Cost	Evans Exhibit 1 pg. 4, Line 25 * NC Alloc. Factor	
17 Non-Residential EE Earned Utility Incentive	Evans Exhibit 1 pg. 4, Line 25 * NC Alloc. Factor	
18 Return on undercollection of Non-Residential EE Program Costs	Miller Exhibit 3 page 7	
19 Total EE Program Cost and Incentive Components	Line 16 + Line 17 + Line 18	
20 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	
21 Total Non-Residential EE Program Cost and Incentive Revenue Requirements	Line 19 * Line 20	
22 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 2	14,570,381
23 Total Non-Residential EE Revenue Requirement	Line 21 + Line 22	14,570,381
24 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 6	
25 Non-Residential EE Revenue Requirement	Line 23 - Line 24	14,570,381
26 Projected NC Residential Sales (KWh)	Miller Exhibit 6, pg. 1, Line 8	18,183,662,735
27 NC Non-Residential EE billing factor (Cents/KWh)	Line 25/Line 26*100	0.0801

E-7 Sub 1105 Rider 8 Year 1 Estimate	E-7 Sub 1130 Year 2017 Yr 2 LR Estimate	E-7 Sub 1164 Rider 10 True up	Year 2017 Year 1
38,791,601		32,155,814	70,947,415
9,347,504		9,073,243	18,420,747
		1,588,185	1,588,185
48,139,105		42,817,241	90,956,346
1,001,482		1,001,402	
49,210,447		42,877,271	91,087,718
6,039,892	9,466,867	2,627,210	18,133,969
54,250,339	9,466,867	45,504,481	109,221,688
			56,058,591
			53,163,097
			18,183,662,735
			0.2924

DSM Programs

Line	Reference	Year 2017 Yr 3 LR Estimate
28 Non-Residential DSM Program Cost	Evans Exhibit 1, pg. 4 Line 26 * NC Alloc. Factor	
29 Non-Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 4 Line 26 * NC Alloc. Factor	
30 Return on undercollection of Non-Residential DSM Program Costs	Miller Exhibit 3 page 8	
31 Total Non-Residential DSM Program Cost and Incentive Components	Line 28 + Line 29 + Line 30	
32 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 13	
33 Total Non-Residential DSM Revenue Requirement	Line 31 * Line 32	
34 Total Collected for Vintage Year 2016 (through estimated Rider 9)	Miller Exhibit 4 Line 10	
35 Non-Residential EE Revenue Requirement True-up Amount	Line 33- Line 34	
36 Projected NC Non-Residential Sales (KWh)	Miller Exhibit 6 pg. 1, Line 9	
37 NC Non-Residential DSM billing factor	Line 35/Line 36*100	

E-7 Sub 1105 Rider 8 Year 1 Estimate	E-7 Sub 1164 Rider 10 True Up	Year 2017 Year 1
13,389,985	(1,438,846)	11,951,339
9,703,101	(234,452)	3,468,649
	4,761	4,761
17,093,086	(1,668,337)	15,424,749
1,001,482	1,001,402	
17,118,418	(1,670,676)	15,447,742
		15,361,431
		86,311
		18,177,460,568
		0.0005

** Actual regulatory fee rate in effect in year of collection. May differ from original filed estimates.

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Year 2 Lost Revenues for Vintage Year 2018

RESIDENTIAL

Line	Reference	2018
1 Residential Net Lost Revenues	Evans Exhibit 2 pg. 3 Line 115	6,294,025
2 Projected NC Residential Sales (kWh)	Miller Exhibit 6 pg 1	\$ 21,806,637,265
3 NC Residential EE Billing Factor (Cents/kWh)	Line 1/Line 2*100	0.0289

NON-RESIDENTIAL

Energy Efficiency Programs

	Reference	2018
4 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 3 Line 131	10,271,966
5 Impact of Revised Forecast from Rider 9	Miller Exhibit 7 pg 1	2,013,078
6 Total Revenue Requirement	Line 4 + Line 5	12,285,044
7 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6 pg 1	17,670,299,445
8 NC Non-Residential EE billing factor (Cents/kWh)	Line 6/Line 7*100	0.0695

Demand Side Management

	Reference	2018
9 Impact of Revised Forecast from Rider 9	Miller Exhibit 7 page 1	534,763
10 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6 pg 1	18,078,506,705
11 NC Non-Residential EE billing factor (Cents/kWh)	Line 9/Line 10*100	0.0030

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1164
Estimated Program Costs, Earned Incentive and Lost Revenues for Vintage Year 2019

RESIDENTIAL

Line	Reference	2019
1 Residential EE Program Cost	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	\$ 41,002,874
2 Residential EE Earned Utility Incentive	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	3,801,819
3 Total EE Program Cost and Incentive Components	Line 1 + Line 2, Evans Exhibit 1, Line 10	44,804,694
4 Residential DSM Program Cost	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	10,577,352
5 Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	2,773,086
6 Total DSM Program Cost and Incentive Components	Line 4 + Line 5, Evans Exhibit 1, Line 11	13,350,438
7 Total EE/DSM Program Cost and Incentive Components	Line 3 + Line 6	58,155,132
8 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1.001402
9 Total EE/DSM Program Cost and Incentive Revenue Requirement	Line 7 * Line 8	58,236,665
10 Residential Net Lost Revenues	Evans Exhibit 2 pg. 3 Line 141	18,783,204
11 Total Residential EE Revenue Requirement	Line 9 + Line 10	\$ 77,019,869

See Miller Exhibit 1
for rate

NON-RESIDENTIAL Energy Efficiency Programs

Line	Reference	2019
12 Non-Residential EE Program Cost	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	\$ 41,671,833
13 Non-Residential EE Earned Utility Incentive	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	8,464,629
14 Total EE Program Cost and Incentive Components	Line 12 + Line 13, Evans Exhibit 1, Line 25	50,136,461
15 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1.001402
16 Total Non-Residential EE Program Cost and Incentive Revenue Requirements	Line 14 * Line 15	50,206,753
17 Non-Residential Net Lost Revenues	Evans Exhibit 2 pg. 3 Line 157	5,590,446
18 Total Non-Residential EE Revenue Requirement	Line 16 + Line 17	\$ 55,797,199
19 Projected NC Residential Sales (kWh)	Miller Exhibit 6, pg. 1, Line 12	17,670,299,445
20 NC Non-Residential EE billing factor (Cents/kWh)	Line 18/Line 19*100	0.3158

DSM Programs

Line	Reference	2019
21 Non-Residential DSM Program Cost	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	\$ 12,538,168
22 Non-Residential DSM Earned Utility Incentive	Evans Exhibit 1, pg. 5 * NC Alloc. Factor	3,287,157
23 Total Non-Residential DSM Program Cost and Incentive Components	Line 21 + Line 22, Evans Exhibit 1, Line 26	15,825,324
24 Revenue-related taxes and regulatory fees factor	Miller Exhibit 2, pg. 7	1.001402
25 Total Non-Residential DSM Revenue Requirement	Line 23 * Line 24	15,847,512
26 Projected NC Non-Residential Sales (kWh)	Miller Exhibit 6, pg. 1, Line 13	18,078,506,705
27 NC Non-Residential DSM billing factor	Line 25/Line 26*100	0.0877

Docket No. E-7, Sub 1164
Gross Receipts Tax Years 2014 through estimated 2019

	<u>Year</u>		<u>Actual GRT Rate In Effect</u>
	2014	Jan - June	1.034554
		July - Dec	1.001352
Rider 5	2014	Weighted Average	1.017953
	2015	Jan - June	1.001352
		July - Dec	1.001482
Rider 6	2015	Weighted Average	1.001417
Rider 7	2016	Jan - June	1.001482
		July - Dec	1.001402
		Weighted Average	1.001442
Rider 8	2017		1.001402
Rider 9	2018		1.001402
Rider 10	2019		1.001402

Note: the current rate is used as the estimate for 2018 and 2019. This will be subject to true-up based on actual rates in effect.

I/A

Duke Energy Carolinas, LLC
DSM/EE Cost Recovery Rider 10
Docket Number E-7 Sub 1164
Revised Forecasted 2019 kWh Sales for Rate Period for Vintage Years 2014-2019

Fall 2017 Sales Forecast - kWhs		Forecasted 2019 sales		
North Carolina Retail:				
Line				
1	Residential	21,806,637,265		
2	Non-Residential	34,250,780,653		
3	Total Retail	56,057,417,918		
NC Opt Out Sales		Total Usage	Revised Opt-Outs	Net Usage
Vintage 2014 Actual Opt Out				
4	EE	34,250,780,653	15,367,415,030	18,883,365,623
5	DSM	34,250,780,653	15,556,570,256	18,694,210,397
Vintage 2015 Actual Opt Out				
6	EE	34,250,780,653	15,487,735,641	18,763,045,012
7	DSM	34,250,780,653	15,759,845,446	18,490,935,206
Vintage 2016 Actual Opt Out				
8	EE	34,250,780,653	15,761,176,618	18,489,604,035
9	DSM	34,250,780,653	16,040,571,583	18,210,209,069
Vintage 2017 Actual Opt Out				
10	EE	34,250,780,653	16,067,117,918	18,183,662,735
11	DSM	34,250,780,653	16,073,320,085	18,177,460,568
Vintage 2018 Estimated Opt Out				
12	EE	34,250,780,653	16,580,481,208	17,670,299,445
13	DSM	34,250,780,653	16,172,273,948	18,078,506,705
Vintage 2019 Estimated Opt Out				
14	EE	34,250,780,653	16,580,481,208	17,670,299,445
15	DSM	34,250,780,653	16,172,273,948	18,078,506,705

Duke Energy Carolinas, LLC

Electricity No. 4
 North Carolina Thirteenth Revised Leaf No. 62
 Superseding North Carolina Twelfth Revised Leaf No. 62

I/A

Rider EE (NC)
 ENERGY EFFICIENCY RIDER

APPLICABILITY (North Carolina Only)

Service supplied under the Company's rate schedules is subject to approved adjustments for new energy efficiency and demand-side management programs approved by the North Carolina Utilities Commission (NCUC). The Rider Adjustments are not included in the Rate Schedules of the Company and therefore, must be applied to the bill as calculated under the applicable rate.

As of January 1, 2019, cost recovery under Rider EE consists of the four year term program, years 2014-2017, as well as rates under the continuation of that program for years 2018 -2019 as outlined below. This Rider applies to service supplied under all rate schedules, except rate schedules OL, FL, PL, GL and NL for program years 2014-2019.

GENERAL PROVISIONS

This Rider will recover the cost of new energy efficiency and demand-side management programs beginning January 1, 2014, using the method approved by the NCUC as set forth in Docket No. E-7, Sub 1032, Order dated October 29, 2013, as revised by Docket No. E-7, Sub 1130, Order dated August 23, 2017.

TRUE-UP PROVISIONS

Rider amounts will initially be determined based on estimated kW and kWh impacts related to expected customer participation in the programs, and will be true-up as actual customer participation and actual kW and kWh impacts are verified. If a customer participates in any vintage of programs, the customer is subject to the true-ups as discussed in this section for any vintage of programs in which the customer participated.

RIDER EE OPT OUT PROVISION FOR QUALIFYING NON-RESIDENTIAL CUSTOMERS

The Rider EE increment applicable to energy efficiency programs and/or demand-side management programs will not be applied to the energy charge of the applicable rate schedule for customers qualified to opt out of the programs where:

- a. The customer has notified the Company that it has implemented, or has plans for implementing, alternative energy efficiency measures in accordance with quantifiable goals.
- b. Electric service to the customer must be provided under:
 1. An electric service agreement where the establishment is classified as a "manufacturing industry" by the Standard Industrial Classification Manual published by the United States Government and where more than 50% of the electric energy consumption of such establishment is used for its manufacturing processes. Additionally, all other agreements billed to the same entity associated with the manufacturing industry located on the same or contiguous properties are also eligible to opt out.
 2. An electric service agreement for general service as provided for under the Company's rate schedules where the customer's annual energy use is 1,000,000 kilowatt hours or more. Additionally, all other agreements billed to the same entity with lesser annual usage located on the same or contiguous properties are also eligible to opt out.

The following additional provisions apply for qualifying customers who elect to opt out:

For customers who elect to opt out of energy efficiency programs, the following provisions also apply:

- Qualifying customers may opt out of the Company's energy efficiency programs each calendar year only during the annual two-month enrollment period between November 1 and December 31 immediately prior to a new Rider EE becoming effective on January 1. (Qualifying new customers have sixty days after beginning service to opt out).
- Customers may not opt out of individual energy efficiency programs offered by the Company. The choice to opt out applies to the Company's entire portfolio of energy efficiency programs.
- If a customer participates in any vintage of energy efficiency programs, the customer, irrespective of future opt out decisions, remains obligated to pay the remaining portion of the lost revenues for each vintage of energy efficiency programs in which the customer participated.
- Customers who elect to opt out during the two-month annual enrollment period immediately prior to the new Rider EE becoming effective may elect to opt in to the Company's energy efficiency programs during the first 5 business days of March each calendar year. Customers making this election will be back-billed retroactively to the effective date of the new Rider EE.

For customers who elect to opt out of demand-side management programs, the following provisions also apply:

- Qualifying customers may opt out of the Company's demand-side management program during the enrollment period between November 1 and December 31 immediately prior to a new Rider EE becoming effective on January 1 of the applicable year. (Qualifying new customers have sixty days after beginning service to opt out).

Duke Energy Carolinas, LLC

Electricity No. 4
 North Carolina Thirteenth Revised Leaf No. 62
 Superseding North Carolina Twelfth Revised Leaf No. 62

Rider EE (NC)
 ENERGY EFFICIENCY RIDER

- If a customer elects to participate in a demand-side management program, the customer may not subsequently choose to opt out of demand-side management programs for three years.
- Customers who elect to opt out during the two-month annual enrollment period immediately prior to the new Rider EE becoming effective may elect to opt in to the Company's demand-side management program during the first 5 business days of March each calendar year. Customers making this election will be back-billed to the effective date of the new Rider EE.

Any qualifying non-residential customer that has not participated in an energy efficiency or demand-side management program may opt out during any enrollment period, and has no further responsibility to pay Rider EE amounts associated with the customer's opt out election for energy efficiency and/or demand-side management programs.

ENERGY EFFICIENCY RIDER ADJUSTMENTS (EEA) FOR ALL PROGRAM YEARS

The Rider EE amounts applicable to the residential and nonresidential rate schedules for the period January 1, 2019 through December 31, 2019 including utility assessments are as follows:

<u>Residential</u>	Vintage 2014, 2015 ¹ , 2016 ¹ , 2017 ¹	0.1091¢ per kWh
	Vintage 2017 ² , 2018 ² , 2019 ²	0.4229¢ per kWh
	Total Residential Rate	0.5320¢ per kWh
<u>Nonresidential</u>		
	Vintage 2014 ³	
	Energy Efficiency	(0.0061)¢ per kWh
	Demand Side Management	(0.0002)¢ per kWh
	Vintage 2015 ³	
	Energy Efficiency	0.0024¢ per kWh
	Demand Side Management	(0.0024)¢ per kWh
	Vintage 2016 ³	
	Energy Efficiency	(0.0126)¢ per kWh
	Demand Side Management	(0.0015)¢ per kWh
	Vintage 2017 ³	
	Energy Efficiency	0.3725¢ per kWh
	Demand Side Management	0.0005¢ per kWh
	Vintage 2018 ³	
	Energy Efficiency	0.0695¢ per kWh
	Demand Side Management	0.0030¢ per kWh
	Vintage 2019 ³	
	Energy Efficiency	0.3158¢ per kWh
	Demand Side Management	0.0877¢ per kWh
	Total Nonresidential	0.8286¢ per kWh

¹ Includes the true-up of program costs, shared savings and lost revenues from Year 1 of Vintage 2017 and Year 2 of Vintage 2016, and Year 3 of 2015.

² Includes prospective component of Vintage 2017, 2018 and 2019.

³ Not Applicable to Rate Schedules OL, FL, PL, GL, and NL.

Each factor listed under Nonresidential is applicable to nonresidential customers who are not eligible to opt out and to eligible customers who have not opted out. If a nonresidential customer has opted out of a Vintage(s), then the applicable energy efficiency and/or demand-side management charge(s) shown above for the Vintage(s) during which the customer has opted out, will not apply to the bill.

NC Public Staff
Docket No. E-7 Sub 1164
NC Public Staff Data Request No. 3
2018 DSM/EE Rider (Avoided Costs)
Item No. 3-1
Page 1 of 2

DUKE ENERGY CAROLINAS, LLC

Request:

In response to Item 1 of Data Request No. 6 in the 2017 Rider proceeding in Docket No. E-7, Sub 1130, the Company stated the following:

To the extent that the Avoided Costs are approved on or before December 31 of a given year, the updated Avoided Costs would be used in the projection portion of the filing completed in March of the following year. As an example, if the Avoided Costs filing which was filed in 2016 is approved on or before December 31, 2017, then the updated Avoided Capacity and Energy will be applied to the projection for Vintage Year 2019 included in the filing made in March of 2018.

- a. Please indicate whether the Company's filing has included avoided capacity benefits for all years of each program's measure life.
- b. If the Company has included avoided capacity benefits for all years of each program's measure life, please explain in detail how this approach is consistent with the Commission's October 11, 2017 Order in Docket No. E-100, Sub 148, where the Company's approved avoided capacity cost rates do not include any avoided capacity costs in years 2018-2022.

Response:

- a. The DEC 2018 DSM/EE Rider filing included avoided capacity cost benefits in every year during the life of each measure.
- b. The current DEC DSM/EE Mechanism approved in Docket E-7, Sub 1130 states:

"For the PPI for Vintage Years 2019 and afterwards, the Program-specific per kW avoided capacity benefits and per kWh avoided energy benefits used for the initial estimate of the PPI and any PPI true-up will be derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing."

The Company has followed the agreed upon mechanism by establishing avoided capacity and energy cost benefits "...derived from the underlying resource plan, production cost model, and cost inputs" used in the most recent Commission-approved Avoided Cost Proceeding. Due to fundamental differences between a Qualifying Facility (QF) and a DSM/EE measure, the avoided cost benefits for EE and DSM programs should not be, and were not intended to be, exactly the same as those used to establish QF payments. For example, the currently approved DEC DSM/EE mechanism specifically allows avoided energy rates to be modeled differently for DSM/EE programs (which uses the projected hourly EE portfolio) than for QF's (which uses a flat 100 MW power purchase). In this case, the resulting avoided energy rates for DSM/EE are different than for QF purchases, while being "derived from" the same underlying data and models.

The mechanism, however, does not address the specifics required to properly determine the avoided capacity costs of DSM/EE programs. DSM/EE measures are different and must be evaluated differently than Qualifying Facilities. The Public Staff questions appear to contend that because avoided capacity credits for a QF are calculated based upon the projected in-service date for the next avoidable generating unit, then that same assumption should also be applied to the calculation of avoided capacity costs for DSM/EE measures. If indeed the case, that contention fails to recognize that the capacity credits for a QF were derived after inclusion of the DSM/EE portfolio in the resource plan. The very fact that the DSM/EE portfolio has been included in the resource plan is why the QF capacity credit is zero for the period 2018-22. The valuation of QF capacity credits is incremental to a resource plan which already includes the DSM/EE portfolio. If the DSM/EE portfolio had not been included in the resource plan, then the QF capacity credits would have been the same as those used in the DSM/EE valuation of cost effectiveness because the removal of the DSM/EE portfolio would have resulted in an immediate resource need.

DUKE ENERGY CAROLINAS, LLC

Request:

In view of the Commission's Order in Docket No. E-7, Sub 1130, and specifically the Evidence for Finding and Conclusion No. 28, (*see* "The Commission finds that the revision to Paragraph 69 better links the savings and financial incentives for DEC's DSM/EE programs with the rates it pays QFs for avoided energy . . .", p. 35), please explain why it is in the public interest for the Company's proposed rider to include the benefits of avoided capacity costs during years when the currently approved PURPA-based avoided costs for QFs identify zero capacity cost benefits.

Response:

The Company has complied with the requirements in Paragraph 69, which state that the program-specific per KW avoided capacity benefits used for the estimate of the PPI are derived from the underlying resource plan.

The avoided capacity benefit attributed to the DSM/EE portfolio is in the public interest because if the DSM/EE portfolio had not been included in the underlying resource plan, that resource plan would have shown an immediate resource need, thereby requiring the construction of additional capacity.

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NC Public Staff
Docket No. E-7 Sub 1164
NC Public Staff Data Request No. 3
2018 DSM/EE Rider (Avoided Costs)
Item No. 3-3
Page 1 of 1

DUKE ENERGY CAROLINAS, LLC

Request:

Please provide a reconciliation of the proposed calculation of the avoided capacity cost benefits with the calculation of the avoided capacity cost rates approved in Docket No. E-100, Sub 148. Other than difference between the 100 MW differential and the resulting DSM/EE program load shapes, this response should include a narrative addressing all differences between the PROSYM model runs incorporated in this filing and the model runs applied in the approved avoided energy costs in Docket No. E-100, Sub 148. This response should include a reconciliation with respect to data inputs and other model changes.

Response:

Avoided Capacity Costs

Please see the Excel file attached in response to item 5 ("Confidential - DEC PSDR3-5 - DEC Avoided Capacity Costs.xlsx").

Avoided Energy Costs

The same PROSYM model was used to generate the production cost savings due to EE as was used to produce the avoided energy costs approved in Docket No. E-100, Sub 148. There were no changes other than how the avoided energy was modeled. Sub 148 used a 100MW purchase in all hours to model the avoided energy while the DSM/EE used the projected EE programs to model the avoided energy. No other changes were made.

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NC Public Staff
Docket No. E-7 Sub 1164
NC Public Staff Data Request No. 3
2018 DSM/EE Rider (Avoided Costs)
Item No. 3-4
Page 1 of 1

DUKE ENERGY CAROLINAS, LLC

Request:

For comparison purposes, please provide the proposed annual reduction in production costs, the reduction in energy sales, and the avoided energy rates per MWH from 2017 through 2042, as compared to the avoided energy costs in Docket No. E-100, Sub 148.

Response:

Please see the attached Excel file ("Confidential – DEC PSDR3-4 - DEC Avoided Energy Rates.xlsx").



Confidential - DEC
PSDR3-4 - DEC Avoid

CONFIDENTIAL

NC Public Staff
Docket No. E-7 Sub 1164
NC Public Staff Data Request No. 3
2018 DSM/EE Rider (Avoided Costs)
Item No. 3-5
Page 1 of 1

DUKE ENERGY CAROLINAS, LLC

Request:

For comparison purposes, please provide the proposed annual reduction in avoided capacity costs and avoided capacity rates per kW from 2017 through 2042, as compared to the avoided energy costs in Docket No. E-100, Sub 148.

Response:

Please see the attached Excel file ("Confidential - DEC PSDR3-5 - DEC Avoided Capacity Costs.xlsx").



Confidential - DEC
PSDR3-5 - DEC Avoid

NC Public Staff
Docket No. E-7 Sub 1164
NC Public Staff Data Request No. 14
2018 DSM/EE Rider (Avoided Costs)
Item No. 14-1
Page 1 of 1

DUKE ENERGY CAROLINAS, LLC

Request:

In regard to the Company's response to Item 4 of Public Staff Data Request No. 3, please provide a discussion on why the difference in the PURPA approved avoided energy rates and the proposed avoided energy rates significantly increases in 2025. If possible, please identify the changes in the bundle of DSM/EE programs and the program(s) load shapes and other characteristics that are believed to create the growing disparity in rates relative to the constant load and load shape associated with the PURPA model.

Response:

The EE avoided energy rates are higher than the PURPA rates in most years. This can be attributed to a couple of factors:

1. The load factor of EE is 70% or less compared to the 100% load factor of the PURPA 100MW purchase. Thus, the EE avoided energy creates savings in higher cost hours on average than the PURPA purchase.
2. The expansion plan is not adjusted after EE is removed from the base. This increases production cost of the EE base as compared to the PURPA base because more expensive resources are relied upon to serve load.

The difference in 2025 is that gas price is taken from the fundamental forecast instead of the market forecast. Prior to 2025 the market forecast is used. There is no smoothing period between forecasts, so this creates a step change in system production cost that is reflected in the avoided energy rates.

DUKE ENERGY CAROLINAS, LLC

Request:

Please provide a narrative on the pre-screening process that describes the inputs, decision making criteria, and any verification of cost effectiveness that leads to the development of the bundle of DSM programs in the portfolio.

Response:

As further clarified by the Public Staff, the following response will address both Energy Efficiency (EE) and Demand Response (DR) programs and the term "portfolio" will include both the existing programs offered by the Company as well as the projection of programs included in the forecast for the IRP process.

DEC's portfolio of EE and DR programs are reviewed/updated throughout the year as (1) new or obsolete measures are identified, (2) impacts are revised due to EM&V results, (3) program costs and participation projections are updated, and (4) revised avoided costs are applied. The update process involves a thorough review of proposed revisions by a variety of internal stakeholders, along with new cost-effectiveness evaluations, to ensure they serve to enhance the overall program offering. Decisions are made to determine if a new program is needed or if changes are required related to the composition, costs and size of the current programs, including whether or not a particular program should be discontinued if no longer found to be cost-effective.

For the long-term forecast of EE and DR programs included in the IRP forecast, the Company starts with the Program Manager expectations of measure mix, program costs and customer participation for the next 5 years and then blends those expectations together with a longer term view of the overall EE and DR program potential from the most current Market Potential Study. The Market Potential Study includes estimations of Cost Effectiveness (based on the Company's Avoided Costs approved at the time of the Market Potential Study) to determine the Economic and Achievable Potential (which is a subset of the Economic Potential). This Achievable potential is used to create the long-term hourly forecast of EE and DR measures submitted to the IRP group for modeling.

DUKE ENERGY CAROLINAS, LLC

Request:

Please provide a narrative that describes the integration process of supply side and demand side resources where DEC attempts to determine the optimal level of prospective DSM/EE programs. This response should include discussion on areas in the process where there is a lack of integration. This response should also include a discussion of how DEC identifies the threshold DSM/EE levels that result in changes in the resource plan, e.g. with zero DSM/EE, the resource plan results in new capacity needed in year X, with some level of DSM/EE, the need for new capacity is moved out to year X +1, with further DSM/EE, the need for new capacity is moved out to year X + 2 and so on. If DEC does not do this type of analysis, please explain how DEC determines that its total quantity of DSM/EE is optimal in the context of an *Integrated* Resource Plan that in principle is meant to balance supply- and demand-side resources such that the marginal MW of supply and demand-side resources are equal in cost.

Response:

Unlike natural gas units, solar facilities, hydro facilities or other supply-side options, DSM/EE MW impacts depend on forecasts of customer adoption for each individual DSM/EE measure and program. These long-term adoption rate estimates are shown at a technical potential, economic potential and achievable potential levels as represented in periodically updated "Market Potential Studies." Shorter term projections of EE MW impacts come from forecasted adoption rates from existing NCUC approved DSM/EE programs based on the experience of the program managers along with M&V results. It is this combination of short-term projections for existing programs and longer term achievable potential that, when combined, produce the MW and MWh reduction in the retail load forecast due to utility sponsored EE. It must be noted that achievable potential as represented in the Market Potential Study recognizes many factors outside of a traditional IRP process which focuses primarily on PVRR minimization. Factors such as appliance turn-over rates, participant cost effectiveness, general customer acceptance, free rider assumptions, efficiency standards, etc. all influence long-term projections for DSM/EE impacts. Furthermore, DSM/EE programs have separate cost-effectiveness metrics that include the utility cost test (UCT), the participant cost test (PCT) and the non-participant (or rate impact) RIM upon which programs are submitted to the NCUC for consideration. The IRP process, once completed, does inform DSM/EE cost-effectiveness for future filings by providing the EE analysis the avoided marginal energy benefits of DSM/EE consistent with the IRP planning assumptions around load, commodity prices and other input variables. Similar to historic QF pricing of capacity, historic DSM/EE utilize the current cost of a peaker for the avoided capacity component of cost effectiveness irrespective of the utility's need for capacity. All approved cost-effective programs then reduce the retail load that goes into the IRP. The balancing of EE relative to utility need for capacity, as described in Staff's question, would happen when

incremental new programs are tested for cost effectiveness under the UCT. At that point, for example, if the utility did not have a need new capacity until 2022, no avoided capacity value would be ascribed in the UCT until 2022. By way of comparison, this is consistent with new solar facilities that would not have capacity value ascribed until 2022 while existing solar facilities are receiving a capacity payment based on an immediate need for capacity. It is wholly consistent to treat avoided capacity value for existing EE the same way existing QFs are treated with respect to capacity valuation, while treating incremental EE capacity value in the same manner incremental solar QF capacity value is being treated.

DUKE ENERGY CAROLINAS, LLC

Request:

Please discuss the changes in the resource plan (e.g. new capacity would be needed sooner or later and avoided energy and capacity costs would go up or down) that would likely occur if all anticipated future QF contracts that are modeled in the IRP are taken out.

Response:

If all anticipated future QF contracts were removed from the DECarolinas 2016 resource plan, the need for new capacity would advance one year, from December 2022 to December 2021. Some of the future QFs already have existing LEOs before November 1, 2016. These QFs will have capacity payments that did not take into account the need for capacity in the derivation of the capacity rate.

NC Public Staff
Docket No. E-7 Sub 1164
NC Public Staff Data Request No. 16
2018 DSM/EE Rider (Avoided Costs)
Item No. 16-1
Page 1 of 1

DUKE ENERGY CAROLINAS, LLC

Request:

Please reconcile the following statement from the testimony of Tim Duff in Docket No. E-7, Sub 1130 with Company's response to Item 1 of Public Staff Data Request No. 3 in Docket E-7, Sub 1164:

In Docket No. E-7, Sub 1130, lines 16 through 18 of page 7 of Company witness Duff's prefilled testimony read, "Another benefit of the this agreement is that it eliminates the potential for avoided energy and avoided capacity costs to be based upon inconsistent assumptions."

In response to Item 1 of Public Staff Data Request No. 3 in Docket E-7, Sub 1164, the Company's identifies the fundamental differences between a qualifying Facility (QF) and a DSM/EE measure and goes on to express that the avoided cost benefits for EE and DSM should not be and were not intended to be exactly the same measure.

Response:

The reconciliation between the two statements referenced in this question is not difficult when looking at the two statements in context, as no element of the two statements is conflicting. The first statement referenced from Mr. Duff's Supplemental and Rebuttal Testimony, when reviewed in context of the entire paragraph from which the statement above is excerpted, clearly is referring to the "inconsistent assumptions" that would exist between using Avoided Energy rates from an IRP filing that could be based on a different resource plan than the Avoided Capacity rates simply due to the timing of the approval of an Avoided Cost filing (the source for the Avoided Capacity) and the acceptance of an IRP (the source for the Avoided Energy). This very situation would have occurred during Vintage 2018 under the previous "trigger" methodology where Avoided Energy rates would have been calculated using the 2016 IRP, however, due to the lag in timing of the approval of the 2016 Avoided Cost filing the Avoided Capacity rates would have been calculated based on the 2014 Avoided Cost filing.

The language below from Lines 18 through 23 of the same page 7 referenced above along with lines 1 through 7 of page 8 of that same document removes any doubt regarding the meaning of the statement listed above by the Public Staff:

"Absent the proposed revisions, the existing language in Paragraph 69 could have resulted in DSM and EE programs being evaluated using avoided energy rates from the Company's Integrated Resource Plan that were not based on the same fundamental assumptions used in the determination of the avoided capacity rates, which are those approved in the Company's biennial avoided cost proceeding. This potential mismatch could have undermined the validity of the cost effectiveness evaluation. The new language eliminates this potential problem by aligning the assumptions approved for both avoided energy and avoided capacity rates, as the proposed

revisions to the Mechanism call for using the most recently approved avoided energy cost and most recently approved avoided capacity cost from the same proceeding – i.e., the Company's biennial avoided cost proceeding."

The second statement taken from the Company's response Item 1 of Public Staff Data Request No. 3 in Docket E-7, Sub 1164 referenced by the Public Staff is intended to describe that, even when using the approved Avoided Cost Filing as the basis for both Avoided Energy and Avoided Capacity, the intent was to use the same methodology for determining both Avoided Energy and Avoided Capacity as has always been used in the past, just that the resource plan used for those calculations would be based on the same plan as was used in the Avoided Cost filing.

In fact, in the proceeding associated with eliminating the "trigger" methodology, Docket E-7, Sub 1130, a major focus was to align the timing of the avoided energy cost with the expansion plan used in the most recent approved PURPA proceeding. Specific attention was made to point out that the avoided energy cost from the PURPA proceeding applied to the load shape for a QF resource. There is a fundamental difference between a QF, a resource that has a fixed 100 MW of capacity for every hour for a 10 year period, and an EE portfolio, a resource that contains multiple measures. They have different load shapes and effective useful lives. In addition, the EE portfolio increases over time due to the cumulative effect of adding new customers. Fundamentally, there should be no surprise that there will be differences in the value of Avoided Costs between these two resources.

In the testimony of Mr. Hinton in E-7, Sub 1130, he states on pages 4 and 5:

"The Public Staff and DEC have agreed that the avoided energy costs and avoided capacity costs for use in the Mechanism provide that [the] calculation of the avoided costs should incorporate the same production cost simulation model, expansion plan, and cost inputs approved in the most recent PURPA proceeding with the exception of one difference. PURPA avoided energy costs are derived by taking the difference between one production cost run that includes an assumed 24x7, 100 megawatts (MW) of no-cost qualified facility (QF) energy and one without the 100 MW of QF energy. The avoided energy costs used in the revised Mechanism would be derived by taking a similar differencing approach except the projected hourly load shapes and load reductions associated with the proposed bundle of DSM/EE programs with the 100 MW of no-cost energy would be substituted. As such, calculations of cost-effectiveness and the PPI would generally be based on the same avoided generation cost as the PURPA-based avoided energy costs. Second, the revisions to the Mechanism provide that avoided energy costs to be used in DEC's annual rider filing will be based on the PURPA-approved avoided energy and capacity costs as of December 31 of the prior year. For program approval applications filed pursuant to Rule R8-68, the Company would use the avoided capacity and energy costs approved as of the date of the R8-68 filing."

Mr. Hinton further states on page 6 line 20 and continuing to page 7, line 6:

"Last, the use of PURPA-based avoided costs links the savings and financial incentives afforded the Company for its DSM/EE programs with the rates it pays QFs for avoided energy and avoided capacity. Therefore, I believe that the use of PURPA-based avoided energy and capacity costs will lead to better estimates of the costs avoided by the Company's DSM/EE programs thereby providing a more accurate view of the value of DSM and EE."

From these statements, the Company takes note of the use of the word “generally” in the first excerpt and the use of the words “links” and “PURPA-based” in the second excerpt. Again, it should be clear from Mr. Hinton’s testimony that the intent was to align the determination of both Avoided Energy and Avoided Capacity such that the resource plan used for those calculations would be based on the same plan as was used in the Avoided Cost filing. The key focus of the discussion was avoided energy. The process used to establish avoided capacity was not changing from what it had always been, i.e., that it was “generally” based on or “linked” to the rates paid to QFs for avoided energy and avoided capacity.

PUBLIC STAFF DATA REQUEST 4

DATE SENT: February 5, 2018
RETURN REQUESTED: February 19, 2018

DUKE ENERGY CAROLINAS, LLC

Prepaid Advantage Pilot (Pilot)

PUBLIC STAFF TECHNICAL CONTACT: Jack Floyd and David Williamson
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1. With respect to the customer sectors that are not eligible for Prepay Advantage, please provide details on the "special codes" referred to in section (c)(2)(i)(e) of the application that is related to compliance with Commission Rule R12-11(q). Also, please confirm whether the Company intends to check the status of a prospective participant who might be subject to a "special code" but has not previously been designated as such.
2. With respect to the incentive in Attachment B of the application, please explain how the \$1,964,922 NPV amount was calculated. A review of the DSMore files and spreadsheets for the attachments indicate the values of each input year for the NPV calculation. However, it is not clear how the \$1.50 transaction fee (initial fee for each participant paid by DEC to the vendor each month to recharge the account), equates to the incentive values \$28,944 and \$85,224 values for the pilot phase, and the \$324,327, \$767,406, and \$1,247,790 for the commercial phase.
3. Please provide the sources of data and specific reference that DEC relied upon to determine the 690 kWh savings per customer per year. Assuming an average usage of 1,000 kWh/month, this equates to 5.7% savings over the year (690 / 12,000).
4. Please provide the supporting workpapers and source documentation for the discount rate of 7.09% used in the DSMore calculations. Please also provide the supporting workpapers, including details on the North and South Carolina and federal tax rates. This response should include details on the combined tax rate and whether Section 199 deductions and bonus depreciation is included in these rates.

5. Please identify the differences in the data and assumptions incorporated in Prosym model used in calculating the avoided energy costs for Prepay Advantage as compared to the input data and assumptions incorporated in Docket No. E-100, Sub 148.
6. Please provide support for the avoided capacity cost rate identified in the "Utility Input" worksheet in DSMore. This response should identify any differences in the input data and assumptions incorporated in the approved avoided capacity rates in Docket No. E-100, Sub 148, such as the use of zero capacity value for 2018 - 2022 when the IRP does not show a need for additional capacity.
7. Please provide detailed support for the avoided transmission and distribution rate identified in the "Utility Input" worksheet in DSMore.

PUBLIC STAFF DATA REQUEST 5

DATE SENT: February 26, 2018
RETURN REQUESTED: March 5, 2018

DUKE ENERGY CAROLINAS, LLC

**Prepaid Advantage Pilot (Pilot),
E-7, Sub 1167**

PUBLIC STAFF TECHNICAL CONTACT: Bob Hinton and Eric Williams
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1. Please revise the discount rate of 7.09% used in the DSMore calculations to reflect the changes in tax rates associated with the Tax Cuts and Jobs Act of 2017. This response should include support for the calculation.
2. Please revise the calculation of the four cost effectiveness test results assuming that the program generates zero avoided capacity benefits up to and including 2022. This response should include support for the DSmore model runs that is comparable with the "Commercialization" scenario provided.

PUBLIC STAFF DATA REQUEST NO. 21

Date Sent: June 2th, 2018

Reply Requested by: June 4th, 2018

DUKE ENERGY CAROLINAS, LLC
DOCKET NO. E-7, SUB 1164
(2018 DSM/EE RIDER PROCEEDING)

PUBLIC STAFF LEGAL CONTACTS: Lucy Edmondson and Heather D. Fennell

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Subject of Data Request: Rebuttal Testimony

Please provide any available responses electronically. If in Excel format, be sure to include all working formulas. In addition, please include (1) the name and title of the individual who has the responsibility for the subject matter addressed therein, and (2) the identity of the person who prepared the response – by name, occupation, and job title. Please send responses to individual items as soon as completed, instead of waiting to send a comprehensive response.

With regard to the Company's rebuttal testimony, please answer the questions below:

1. On p. 5 of the Rebuttal Testimony of Timothy J. Duff and Richard G. Stevie, Ph.D, Dr. Stevie states that "the current set of DSM programs . . . are not incremental or new programs" and refers to them as "legacy programs".
 - a. In light of this testimony, please explain why the Company gives PowerShare and PowerManager a one-year measure life.
 - b. Please explain why in Docket No. E-7, Sub 831, the Company modeled these two programs as having 13 and 10- year measure lives, respectively, (See pp. 136 and 138 of <http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=ba1e02ff-5dc5-4302-b31b-50caa4613daf>) and then with one year measure lives when the programs were reapproved in Docket No. E-7, Sub 1032.

DEC Response:

(a) The Company utilizes a one-year measure life for its DSM measures in the context of the DSM/EE Rider proceeding because customers have the ability to terminate their participation in the programs on an annual basis. From a planning perspective, the Company assumes that it will manage the programs to maintain a level of participation in the one-year measure lived DSM programs consistent with the impacts assumed in the IRP.

(b) Under the mechanism approved in Docket E-7, Sub 831, the total cost recovery and utility incentive were not tied to individual vintage years but rather a multi-year period and not directly tied to the measure life assumptions. However, the multi-year analysis was broken down into single vintage years with one-year measure lives associated with the cost recovery and utility incentive. This is not the case with the cost recovery and utility incentive mechanism approved in Docket E-7, Sub 1032, which explicitly looks at individual vintage years on an annual basis.

2. Witnesses Duff's and Stevie's testimony on p. 24, Ins.14-16 states, "While the Public Staff would likely not advocate for the Company to shut down its EE programs during "gap years" until a capacity need arrives, from a financial perspective, it is effectively telling them to do just that." Please explain what is meant by the phrase "from a financial perspective." Specifically, is the perspective focused around providing a sufficient rate of return on investment, providing an adequate incentive for the Company to act in a manner that is inconsistent with profit maximization, or some other perspective?

DEC Response: When the Company implements DSM/EE programs, it is delaying the need to build new power plants. Delaying or eliminating the need to build new capacity impacts the expected future earnings for the Company. To remove the financial disincentive associated with the pursuit of DSM/EE, it makes sense to provide the utility with a financial reward similar to that associated with the earnings on a power plant. In other words, in order to further the policy purpose of encouraging utilities to pursue energy efficiency, financial incentives are designed to make the utility essentially indifferent from a financial standpoint with respect to implementing DSM/EE programs versus building a new plant. If the incentive is reduced, that violates that regulatory compact.

3. In view of witnesses Duff's and Stevie's testimony on p. 11, Ins. 10-14 and 19-22, please confirm that the Company derived its proposed annual avoided capacity rate by dividing the annual capacity cost of [BEGIN CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL] MW rating. The annual capacity cost and MW ratings can be found on shown on pages 4 and 7 of 24 from the Company's response to Item 1 of Public Staff Data Request No. 4, Post-Filing in Docket No. E-100, Sub 148.

DEC CONFIDENTIAL Response: Yes, except that the annual capacity cost in the numerator should be [BEGIN CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL].

4. In view of witnesses Duff's and Stevie's testimony on page17, lines 8-13, please confirm that the Company agrees that the use of zeros for avoided capacity costs within the confines of the Order in Docket No. E-100, Sub 148 is appropriate for use in approval of new DSM/EE programs.

DEC Response: To the extent that the Company needs to add new programs or measures in order to realize the capacity reductions associated with DSM/EE programs assumed in IRP Load Forecast, the new measures and programs should receive an annual avoided capacity value (Not Zero).

PUBLIC STAFF DATA REQUEST NO. 22

Date Sent: June 2nd, 2018

Reply Requested by: June 4th, 2018

DUKE ENERGY CAROLINAS, LLC
DOCKET NO. E-7, SUB 1164
(2018 DSM/EE RIDER PROCEEDING)

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Subject of Data Request: Rebuttal Testimony

Please provide any available responses electronically. If in Excel format, be sure to include all working formulas. In addition, please include (1) the name and title of the individual who has the responsibility for the subject matter addressed therein, and (2) the identity of the person who prepared the response – by name, occupation, and job title. Please send responses to individual items as soon as completed, instead of waiting to send a comprehensive response.

With regard to the Company's rebuttal testimony, please answer the questions below:

1. With regard to the statement on Page 11, Lines 10-14 of the Rebuttal Testimony of witnesses Duff and Stevie, please explain how the Company "derived ... avoided capacity using the rates approved in the Company's most recent biennial avoided cost proceeding, which in this case is Docket No. E-100, Sub 148," while using avoided capacity values for years 2019-2022 that were something other than zero.

DEC Response: While the Commission approved avoided capacity rates for QFs establishing a legally enforceable obligation after November 16, 2016 that used a zero value for capacity for the years 2019 to 2022, it was appropriate that the Company use the forecasted avoided capacity costs that recognized the value of the legacy DSM/EE resources in each year underlying the Company's resource plan. DSM and EE programs established prior to November 1, 2016 are the same as QFs that established LEOs prior to that date within the context of E-100 Sub 148. In that docket, the Commission limited the change in QF capacity valuation to new QFs established after November 1 2016 and by extension this principle should also apply to existing EE and DSM offerings. For programs already providing a capacity value underlying the resource plan used in the E-100 Sub 148, i.e. both the EE and DSM programs, the company assumed that these resources would create a value equivalent to the cost of building a new peaker, a method that has been used in all past filings. This starting point

value of building a peaker was provided in E-100 Sub 148 in 2016 dollars and that value was then escalated at the 2.5% rate, also approved in that filing.

2. With regard to the statements made on Page 12, Lines 15-22 of the Rebuttal Testimony of witnesses Duff and Stevie, please explain why the language of Paragraphs 19, 23, and 69 of the Mechanism as revised in Sub 1130 do not set forth the method by which avoided capacity values are set.

DEC Response: The referenced testimony is intended to reflect that the revisions to Paragraph 19, 23, and 69 did not alter the source or manner in which the avoided capacity costs are to be derived for the purpose of calculating cost effectiveness and incentives associated with DSM/EE programs.

3. Paragraphs 68 and 69 of the Mechanism as approved in Sub 1032 (before the Sub 1130 revisions) read as follows as pertains to avoided capacity costs:

68. For the PPI for Vintage Year 2014, the per kW avoided capacity costs used to calculate avoided cost savings shall be those reflected in the filing by Duke Energy Carolinas in Docket No. E-100, Sub 136. ... If both the per kW avoided capacity costs and per kWh avoided energy costs approved by the Commission in Sub 136 and the IRP proceeding are within 2% of the costs filed by the Company, no change from the costs used will be necessary. If one or the other changes by more than 2%, both costs will be changed to the approved amounts.

69. For the PPI for Vintage Years 2015, 2016, and 2017, the presumptive per kW avoided capacity costs ... used to calculate avoided cost savings shall be those determined pursuant to paragraph 68 above. However, if at the time of initial estimation of the PPI for each of those years, either (a) the Company's per kWh avoided energy costs calculated for the purposes of the Company's annual IRP or resource plan update filings have increased or decreased by 20% or more or (b) the Company's per kW avoided capacity costs reflected in the rates approved in the biennial avoided cost proceedings have increased or decreased by 15% or more, the avoided costs (both energy and capacity) will be updated for purposes of the DSM/EE rider proceeding.

Paragraph 69 of the Mechanism as revised in Sub 1130 reads as follows as pertains to avoided capacity costs:

69. For the PPI for Vintage Years 2019 and afterwards, the program-specific per kW avoided capacity benefits ... used

for the initial estimate of the PPI and any PPI true-up will be derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing.

With regard to these two sets of paragraphs, particularly the portion of prior Paragraph 68 that states, "If [either avoided capacity or avoided energy costs] changes by more than 2%, both costs will be changed to the approved amounts," please explain why the Company believes that under the pre-revision Mechanism, assuming the ratchet was triggered, the avoided capacity costs used in the current proceeding would not be based on the Sub 148 avoided capacity costs that include zeros for the years 2019-2022.

DEC Response: Please see response to 22-1.

4. With regard to the calculations provided to the Public Staff during the Sub 1130 proceeding regarding the Vintage 2019 projection, as referenced beginning on Page 15, Line 22 of the Rebuttal Testimony of witnesses Duff and Stevie, please provide all documentation possessed by the Company indicating that the Public Staff agreed with that calculation, or agreed that it would be the basis for the Vintage 2019 PPI calculated under the Revised Mechanism eventually agreed to by the Company and the Public Staff.

DEC Response: The Company does not have documentation that the Public Staff either disagreed or agreed with this analysis. Since this analysis was relied upon in the development of the agreed-upon reduction to the 2018 PPI in Docket E-7, Sub 1130 (as acknowledged in Witness Maness testimony at the Sub 1130 hearing) and the Public Staff never expressed disagreement with the analysis, the Company believes that its intent was clear and was surprised that the Public Staff would take the position that zeros should be used for avoided capacity when this analysis did not utilize zeros for avoided capacity for the Vintage 2019 PPI.

5. With regard to the answer beginning on Page 16, Line 12 of the Rebuttal Testimony of witnesses Duff and Stevie, please provide any and all documentation demonstrating that using Commission-determined avoided capacity costs, including zeros for the years 2019-2022, in "the determination of the cost effectiveness of DSM/EE programs and the calculation of the performance incentives" is inconsistent with the Public Staff's position.

DEC Response: The answer contained in Company's Rebuttal Testimony on Page 16, Line 12 is not based on any additional documentation, but rather simply

looking at the portion of the Commission's order cited by Witness Williams in full context.

6. With regard to the answer beginning on Page 19, Line 14 of the Rebuttal Testimony of witnesses Duff and Stevie, please indicate that of the DSM measures included in Vintage 2019 of the Power Manager and Power Share Programs, how many of the measures are treated in the cost-effectiveness and PPI calculations as new measures beginning in that year. Please explain your answer.

DEC Response: The Company has not added any new measures to Power Share and Power Manager that are being treated as new measures in 2019.

7. With regard to the answer beginning on Page 22, Line 12 of the Rebuttal Testimony of witnesses Duff and Stevie, please indicate that of the measures included in Vintage 2019 of the MyHER Program, how many of the measures are treated in the cost-effectiveness and PPI calculations as beginning in a year prior to 2019. Please explain your answer in light of the one-year persistence assumed for measures under the MyHER Program.

DEC Response: The Company has not added any new measures to the MyHER Program that are being treated as new measures under the MyHER Program in 2019.

8. With regard to the sentence beginning on Page 24, Line 14 of the Rebuttal Testimony of witnesses Duff and Stevie, please identify which of the Company's EE programs the Public Staff is recommending be "shut down" in this proceeding because of the use of zeros for avoided capacity cost for years 2019-2022. Please explain your response.

DEC Response: The Company never said the Public Staff was recommending programs be shut down. Rather, the testimony indicates by using zeros for avoided capacity that effectively removes the financial incentive for the years 2019 to 2022, it is as if the Public Staff wants DEC to shut them down. See also response to Public Staff Data Request 21-2.