

## Income Qualified Power Manager Load Control Service

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R8-68 Filing Requirements	
Income Qualified Power Manager Load Control Service	
Filing Requirements	
(c)(2)(i)(a)	<b>Measure / Program Name</b>
	Income Qualified Power Manager Load Control Service ("Power Manager").
(c)(2)(i)(b)	<b>Consideration to be Offered</b>
	<p>The program provides income-qualified customers with equipment to facilitate participation in Duke Energy Carolinas, LLC's (the "Company" or "DEC") demand response program.</p> <p>Customers may choose to participate via one of the following options:</p> <p><u>Load Control Device(s) Option:</u></p> <p>(1) A Load Control Device(s) provided by the Company.</p> <p><u>Thermostat Options:</u></p> <p>(2) The installation of an eligible thermostat(s) by the Company which will be Customer-owned following enrollment.</p> <p>(3) The enrollment of an eligible Customer-owned thermostat(s).</p> <p>Participants can only be enrolled in one option at a time.</p>
(c)(2)(i)(c)	<b>Anticipated Total Cost of the Measure / Program</b>
	See Attachment B, line 13.
(c)(2)(i)(d)	<b>Source and Amount of Funding Proposed to be Used</b>
	<p>All program costs will be funded from Company's general funds, consisting of all sources of capital.</p> <ul style="list-style-type: none"> <li>These costs will be subject to cost recovery through a Demand-Side Management/Energy Efficiency ("DSM/EE") annual cost recovery rider consistent with Commission Rule R8-69(b).</li> <li>See Attachment B, line 13, for the estimated level of required funding.</li> </ul>
(c)(2)(i)(e)	<b>Proposed Classes of Persons to Whom This Will be Offered</b>
	<p>The program is available to individually metered income qualified residential customers who have participated in income qualified programs, including, but not limited to, EE programs, within the past 36 months from the date of enrollment in the Program. Participating Customers agree to allow the Company to interrupt service to an installed, approved electric heat pump(s) used for cooling and/or approved electric heating source providing primary or backup electric resistance heat.</p>
(c)(2)(ii)(a)	<b>Describe the Measure / Program's Objective</b>

	<p><b><u>Load Control Device(s) Measure</u></b></p> <p>Customers choosing the Load Control Device(s) option agree to allow the Company or its representative to install and operate the necessary control equipment in a suitable location in or about the residence. The Load Control Device(s) option is only available in areas where load control signal can be satisfactorily received. Renters must have the owner's consent to participate in the Load Control Device(s) option.</p> <p>Customers choosing the Load Control Device(s) option must have a heat pump or central air conditioning unit with ducted electric resistance heating elements.</p> <p><b><u>Thermostat Measure</u></b></p> <p>Customers choosing either thermostat option must (1) occupy the residence, (2) have control of the approved central air conditioning and/or central heating units, and (3) must have the thermostat(s) configured in a manner which allows the Company to communicate and control Customer's equipment remotely.</p> <p>Under the provisions of this Program, the Company shall be allowed to monitor the operation of load-controlling equipment as well as the Customer's energy usage and the operation of the controlled devices.</p> <p>Customers choosing either thermostat option must have the following:</p> <ul style="list-style-type: none"> <li>• A heat pump or central air conditioning unit with ducted electric resistance heating elements.</li> <li>• Wi-Fi internet access in the residence.</li> </ul> <p>Customers in a residence that has Wi-Fi/internet access and that has participated in one of the Company's income-qualified energy efficiency programs within the past 36 months may qualify to receive a smart thermostat installed and registered with the thermostat manufacturer at no cost to the Customer.</p> <p>All air conditioning and/or heating units installed at the residence must participate in load control to be enrolled in the program.</p> <p><b><u>Objective</u></b></p> <p>Provide DR measures for income qualified customers utilizing eligible (i) Company or customer supplied smart thermostat devices configured in a manner which allows the Company to remotely communicate and control Customer's equipment via the internet or (ii) load control devices where the load control signal can be satisfactorily received at the Customer's premise. This Program will aid in the Company's efforts to deliver DR benefits to the entirety of the Company's energy delivery system by expanding participation in DR programs.</p>
(c)(2)(ii)(b)	<p><b>Describe the Measure / Program Duration</b></p> <p>Duration - see Attachment A, line 1.</p>
(c)(2)(ii)(c)	<p><b>Describe the Measure / Program Sector and Eligibility Requirements</b></p>

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	Residential customers as described in (c)(2)(i)(e) above with active accounts, who have participated in income-qualified energy efficiency programs may enroll in the Income-qualified option of Power Manager with a registered and eligible thermostat or load control device.
<b>(c)(2)(ii)(d)</b>	<b>Examples of Communication Materials and Related Cost</b>
	<p>The Company will provide, implement and support the program which includes marketing and recruitment services, with an estimated cost of \$14,969.50.</p> <p>Methods of recruitment may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• Distribution of collateral to potential Program participants;</li> <li>• Invitation to enroll by direct email or link to enrollment portal;</li> <li>• Invitation to enroll by text or other mobile application;</li> <li>• Company public website; and</li> <li>• Social Media.</li> </ul>
<b>(c)(2)(ii)(e)</b>	<b>Estimated Number of Participants</b>
	Estimated Participation - see Attachment A, lines 3 - 12. These figures represent the total kW expected to participate in each year, not the number of households, premises or devices.
<b>(c)(2)(ii)(f)</b>	<b>Impact that each measure or program is expected to have on the electric public utility or electric membership corporation, its customer body as a whole, and its participating North Carolina customers</b>
	Estimated Impact - see Attachment A, lines 13 - 54.
<b>(c)(2)(ii)(g)</b>	<b>Any other information the electric public utility or electric membership corporation believes is relevant to the application, including information on competition known by the electric public utility or the electric membership corporation</b>
	Not applicable.
<b>(c)(2)(iii)(a)</b>	<b>Proposed Marketing Plan Including Market Barriers and how the Electric Public Utility Plans to Address Them</b>

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Marketing efforts may include, but are not limited to:

- Distribution of collateral to potential Program participants;
- Invitation to enroll by direct email or link to enrollment portal;
- Invitation to enroll by text or other mobile application;
- Company public website; and
- Social Media.

Note: The Company may not be aware of all market barriers or understand all the methods that can be used to address these market barriers.

Potential market barriers include, but are not limited to:

Market Barrier	Actions to Address
Concern that comfort will be impacted by program activation.	Utilize pre cooling/heating to minimize potential discomfort. Provide information to potential participants that: <ul style="list-style-type: none"> <li>• The heat pump portion of the heating system will not be controlled.</li> <li>• Although heat loss may exceed the capacity of the heat pump, event duration is limited and will typically last 2 to 3 hours.</li> </ul>
Concern that electric bill will increase.	Explain that the program is designed to shift energy use from one part of the day to another. The overall amount of energy used to heat their home will not increase, nor will their electric bill as a result.
Lack of awareness/understanding on the part of the customer regarding DR programs in general, how they work, and what the benefits are (for the customer, the utility and the community).	Ensure that messaging includes clear, easy to understand information regarding the program, and its benefits to participants and all customers. Provide clear and understandable information to customers via phone, email, direct online chat or direct mail.
Customers shifting from traditional load control device option to smart thermostat.	Both options are voluntary programs and customers will be encouraged to make the decision that works better for them. Duke Energy is happy with either choice.
Fear on the part of the customer that the utility may be eavesdropping on them, controlling their thermostat against their will, damaging the thermostat device, causing discomfort to the customer, or some other unwanted intrusive action.	These concerns should be anticipated when third parties such as utilities request remote access to appliances within customers' homes. All messaging and customer support must proactively provide assurance and education about each issue, including the customers' right to opt-out or exit the program at any time.

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	<p>Disruptive or competing programs/incentives on the part of the thermostat manufacture(s) that may lessen or adversely affect the utility's DR capabilities/efforts.</p>	<p>Partnering with vendors allows the utility to leverage the vendors' relationships with the thermostat manufacturers and to cooperatively design DR programs that are to everyone's benefit. The utility is also in the position to cross-market additional energy efficiency measures or programs to the customers which thermostats manufacturers cannot provide.</p>
(c)(2)(iii)(b)	<b>Total Market Potential and Estimated Market Growth throughout the Duration of the Program</b>	
	<p>Market potential represents the number of eligible customers based on eligibility requirements defined in the program tariff. There are approximately 4,557 residential customers that meet the criteria for this program as of July 26, 2023, additional customers will become eligible as EE participation increases each year.</p> <p>Estimated Market Growth (Participation) - see Attachment A, lines 3 - 12.</p>	
(c)(2)(iii)(c)	<b>Estimated Summer and Winter Peak Demand Reduction by Unit Metric and in the Aggregate by Year</b>	
	<p>Estimated Summer and Winter Peak Demand Reductions – see Attachment A, lines 13 - 22 and lines 28 – 29, and Attachment E, lines 1 - 10.</p>	
(c)(2)(iii)(d)	<b>Estimated Energy Reduction per Appropriate Unit Metric and in the Aggregate by Year</b>	
	<p>Estimated Energy Reduction - see Attachment A, lines 23 - 27 and lines 30 - 34</p>	
(c)(2)(iii)(e)	<b>Estimated Lost Energy Sales per Appropriate Unit metric and in the Aggregate by Year</b>	
	<p>Not applicable.</p>	
(c)(2)(iii)(f)	<b>Estimated Load Shape Impacts</b>	
	<p>See sections (c)(2)(iii)(c) and (c)(2)(iii)(d).</p>	
(c)(2)(iv)(a)	<b>Estimated Total and Per Unit Cost and Benefit of the Measure / Program and the Planned Accounting Treatment for Those Costs and Benefits</b>	
	<p>Costs associated with this Program will be expensed as incurred.</p>	

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	<p>Total estimated cost by category – see Attachment B, lines 6 - 9</p> <p>Total estimated benefit – see Attachment B line 12.</p> <p>Total estimated per unit cost by category – see Attachment D, lines 1 - 25.</p> <p>Data shown on Attachment B represents present value of cost and benefits over the life of the program.</p>
(c)(2)(iv)(b)	<p><b>Type, Amount, and Reason for Any Participation Incentives and Other Consideration and to Whom They Will be Offered, Including Schedules Listing Participation Incentives and Other Consideration to be Offered</b></p> <p>Incentives will be awarded on a consistent and nondiscriminatory basis to eligible customers who have successfully implemented a qualifying measure in accordance with the Program tariff and submitted a completed application in compliance with Program requirements. The Company's payment of incentives may be offered in a variety of ways, including, but not limited to bill credits, checks, and prepaid credit cards. Although the Company reserves the right to adjust the incentive on a periodic basis, as appropriate, to reflect changing standards and market conditions, the initial incentive amounts are listed below.</p> <p><b><u>Load Control Device(s) Option:</u></b></p> <p>Load Control Device participants will receive a monthly incentive for the billing months of January through April in the amount of \$6 per month.</p> <p>Load Control Device participants will receive free installation service.</p> <p><b><u>Thermostat Options:</u></b></p> <p>Thermostat participants will receive an Initial Incentive Payment following the successful installation and enrollment of the participating Customer's thermostat(s) in the amount of \$75.</p> <p>Following each twelve months of continuous participation on the thermostat option, Customers will receive an Annual Incentive in the amount of \$25.</p> <p>Thermostat participants will receive:</p> <ul style="list-style-type: none"> <li>• Assistance with registration and application to the program.</li> <li>• Free eligible thermostat.</li> <li>• Free eligible thermostat installation service including registration.</li> </ul> <p>Participants can only be enrolled in one HVAC demand response option at a time.</p>
(c)(2)(iv)(c)	<p><b>Service Limitations or Conditions Planned to be Imposed on Customers Who do not Participate in the Measure / Program</b></p> <p>There are no service limitations or conditions to be imposed on customers who do not participate in the measure/Program.</p> <p>For thermostat participants, the Company shall be allowed, at its discretion, to interrupt service to each heating system for up to four hours during each day of the winter control season</p>

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	<p>months of December through March. Heating unit interruptions shall be limited to a total of 45 hours during any one winter season. Interruptions of heating and/or cooling systems for the remainder of the year are limited to a total of 15 hours. The Company reserves the right to interrupt service outside of these parameters in the event continuity of service is threatened. At its discretion, the Company may use thermostats enrolled in the thermostat options to preheat or precool participating Customers' residences prior to an interruption period.</p> <p>For Load Control Device(s) participants, Company shall be allowed, at its discretion, to interrupt service to each heating system for up to four hours during each day of the winter control season months of January through April. Heating unit interruptions shall be limited to a total of 60 hours during any one winter season. Company reserves the right for interruption outside of these parameters in the event continuity of service is threatened.</p> <p>Program participants who voluntarily opt-out of more than 2 (two) DR events within a peaking season may be asked to leave the program and as such, receive no further compensation from that point onward. A control event opt-out includes non-participation in any part of the interruption time period.</p> <ul style="list-style-type: none"> <li>• Additionally, participants whose thermostat remains chronically offline or unavailable for any reason will be notified by Company of the situation and provided with an opportunity to remedy. Failure to remedy the situation allows Company to ask the customer to leave the program, as above.</li> <li>• If Company is unable to communicate with Customer's thermostat(s) during a load control event, it will be counted as a control event override.</li> </ul>
(c)(2)(v)	<p><b>Cost-Effectiveness Evaluation (including the results of all cost-effectiveness tests and should include, at a minimum, an analysis of the Total Resource Cost Test, the Participant Test, the Utility Cost Test, and the Ratepayer Impact Measure Test) Description of the Methodology Used to Produce the Impact Estimates, as well as, if Appropriate, Methodologies Considered and Rejected in the Interim Leading to the Final Model Specification</b></p> <p>See Attachment B, line 14, for cost-effectiveness scores.</p>
(c)(2)(vi)	<p><b>Commission Guidelines Regarding Incentive Programs (provide the information necessary to comply with the Commission's Revised Guidelines for Resolution of Issues Regarding Incentive Programs, issued by Commission Order on March 27, 1996, in Docket No. M-100, Sub 124, set out as an Appendix to Chapter 8 of these rules)</b></p> <p>The Program does not provide any inducement or incentive affecting participant's decision to install or adopt natural gas or electric service.</p>
(c)(2)(vii)	<p><b>Integrated Resource Plan (explain in detail how the measure is consistent with the electric public utility's or electric membership corporation's integrated resource plan filings pursuant to Rule R8-60)</b></p> <p>Energy and capacity reductions from this program will be included for planning purposes in future integrated resource plans.</p>

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(c)(2)(viii)	Other (any other information the electric public utility or electric membership corporation believes relevant to the application, including information on competition known by the electric public utility or the electric membership corporation)
	Not applicable.
<b>Additional Filing Requirements</b>	
(c)(3)(i)(a)	<b>Costs and Benefits- Any Costs Incurred or Expected to be Incurred in Adopting and Implementing a Measure / Program to be Considered for Recovery Through the Annual Rider Under G.S. 62-133.9</b>
	See Attachment C, lines 11 - 35.
(c)(3)(i)(b)	<b>Estimated total costs to be avoided by the measure by appropriate capacity, energy and measure unit metric and in the aggregate by year</b>
	See Attachment A, lines 45 – 54.
(c)(3)(i)(c)	<b>Estimated participation incentives by appropriate capacity, energy, and measure unit metric and in the aggregate by year</b>
	Incentive per cumulative kW – see Attachment E, lines 21 – 25. Incentive per cumulative kWh – see Attachment F, lines 16 - 20. Incentive per participant – see Attachment D, lines 11 - 15.
(c)(3)(i)(d)	<b>How the electric public utility proposes to allocate the costs and benefits of the measure among the customer classes and jurisdictions it serves</b>
	The program costs for DR programs targeted at North Carolina and South Carolina retail residential customers are allocated to North Carolina retail jurisdiction based on the ratio of peak North Carolina retail kW demand to total peak retail kW demand, then recovered only from North Carolina residential customers.
(c)(3)(i)(e)	<b>The capitalization period to allow the utility to recover all costs or those portions of the costs associated with a new program or measure to the extent that those costs are intended to produce future benefits as provided in G.S. 62-133.9(d)(1)</b>
	No costs from this program will be capitalized.
(c)(3)(i)(f)	<b>The electric public utility shall also include the estimated and known costs of measurement and verification activities pursuant to the Measurement and Verification Reporting Plan described in paragraph (ii)</b>
	The Company's estimated evaluation, measurement and verification ("EM&V") costs for this program are estimated to be 2% of total Program costs.

(c)(3)(ii)(a)

**Measurement and Verification Reporting Plan for New Demand-Side Management and Energy Efficiency Measures: Describe the industry-accepted methods to be used to evaluate, measure, verify, and validate the energy and peak demand savings estimated in (2)(iii)c and d above**

The Company intends to use an independent, third-party consultant specializing in evaluating DR programs. The independent, third-party consultant will customize an EM&V plan with specific activities to carry out the evaluation approach described below.

**Objectives**

Impact evaluation activities verify demand reduction impacts attributable to the program. Process evaluation activities assess the effectiveness of program processes and their impact on the broader program market. Specific objectives for the evaluation of the program include the following:

- Estimate the average (kW) and aggregate (MW) load reductions that are achieved during load control events and the overall average event.
- Forecast load impacts under different event conditions (i.e., time of day, temperature, setpoints, etc.) to create a time/temperature matrix for use by the program to estimate full shed load reduction capabilities.
- Evaluate effectiveness of program design and processes.

**Impact Evaluation**

The goal of the impact evaluation is to assess the average (kW) and aggregate (MW) load reductions attributable to the program and by load control device and/or thermostat, respectively. The independent, third-party EM&V consultant will determine the detailed analysis methodologies, sample design and data collection activities. It is expected the consultant will use an experimental design such as random control testing with a robust regime of test events. The target level for precision is 90/10.

For the impact evaluation, the consultant will utilize whole-house AMI data from an EM&V sample, if applicable, to estimate ex-post and ex-ante load impacts. Load impact estimation will be accomplished using regression models in order to obtain accurate and precise estimates.

**Process Evaluation**

The goal of the process evaluation is to assess program design and implementation processes to improve effectiveness or operational efficiencies. Through the process evaluation, the evaluation contractor will document significant components of the program including program accomplishments, administrative processes, participant experiences during load events, customer satisfaction, program successes and opportunities for improvement to program design and delivery. Ultimately, the process evaluation will provide guidance regarding opportunities for more effective program implementation.

**Process Evaluation Activities**

	The consultant will complete surveys/interviews with participant households and program staff and implementers to understand program processes.		
	<b>Process Evaluation Interviews/Surveys</b>		
	<b>Market Actor</b>	<b>Research Issues (Illustrative)</b>	<b>Approximate Sample Size</b>
	Program Implementers and Associated Staff Interviews	<ul style="list-style-type: none"> <li>Understand program processes, particularly event notification procedures, how incentives are paid and how the program is communicated to customers</li> <li>Develop a program logic model that depicts program processes</li> <li>Identify areas where processes could be improved</li> </ul>	TBD*
	Participant Households Surveys	<ul style="list-style-type: none"> <li>Determine participant satisfaction, particularly post-event</li> <li>Determine participation satisfaction, particularly during non-events</li> </ul>	TBD*
*Sample size will be determined based on the number of program implementers and participants.			
(c)(3)(ii)(b)	<b>Measurement and Verification Reporting Plan for New Demand-Side Management and Energy Efficiency Measures: Provide a schedule for reporting the savings to the Commission</b>		
	The schedule for the EM&V activities will begin after the program has a sufficient amount of participation from which to draw a statistically significant sample. The evaluation plan may be modified based on the actual participation in the Program, as needed to provide a cost effectiveness evaluation, and as agreed to by the independent third-party.		
(c)(3)(ii)(c)	<b>Measurement and Verification Reporting Plan for New Demand-Side Management and Energy Efficiency Measures: describe the methodologies used to produce the impact estimates, as well as, if appropriate, the methodologies it considered and rejected in the interim leading to final model specification</b>		
	Please refer to section (c)(3)(ii)(a) which provides information regarding the methodologies used to produce impact estimates associated with this program.		
(c)(3)(ii)(d)	<b>Measurement and Verification Reporting Plan for New Demand-Side Management and Energy Efficiency Measures: Identify any third party and include all of the costs of that third party, if the electric public utility plans to utilize an independent third party for purposes of measurement and verification</b>		
	The Company intends to use an independent, third-party consultant to provide EM&V services. See section (c)(3)(i)(f) for cost.		

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(c)(3)(iii)	<b>Cost Recovery Mechanism- Describe the Proposed Method of Cost Recovery From its Customers</b>
	The Company seeks to recover program costs, net lost revenues and a utility incentive to the approved cost recovery mechanism in Commission Docket No. E-7 Sub 1032.
(c)(3)(iv)	<b>Tariffs or Rates- Provide Proposed Tariffs or Modifications to Existing Tariffs That Will be Required to Implement Each Measure / Program</b>
	The tariff proposed by the Company for this program is included as Attachment G.
(c)(3)(v)	<b>Utility Incentives- Indicate Whether it Will Seek to Recover Any Utility Incentives, Including, if Appropriate, Net Lost Revenues, in Addition to its Costs</b>
	The Company seeks to recover program costs and any applicable utility incentives pursuant to the approved cost recovery mechanism approved by the North Carolina Utilities Commission in Docket No. E-7 Sub 1032.

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## Income Qualified Power Manager Load Control Service

### Attachment A Participation

Power Manager Load Control Service for Income Qualified		
1	Measure Life (Average)	1
2	Free Rider % (Average)	0.0%
3	Incremental Participants Year 1	2,196
4	Incremental Participants Year 2	10,978
5	Incremental Participants Year 3	19,760
6	Incremental Participants Year 4	28,542
7	Incremental Participants Year 5	37,324
8	Cumulative Participation Year 1	2,196
9	Cumulative Participation Year 2	10,978
10	Cumulative Participation Year 3	19,760
11	Cumulative Participation Year 4	28,542
12	Cumulative Participation Year 5	37,324
13	Cumulative Winter Coincident kW w/ losses (net free) Year 1	2,343
14	Cumulative Winter Coincident kW w/ losses (net free) Year 2	11,717
15	Cumulative Winter Coincident kW w/ losses (net free) Year 3	21,091
16	Cumulative Winter Coincident kW w/ losses (net free) Year 4	30,464
17	Cumulative Winter Coincident kW w/ losses (net free) Year 5	39,838
18	Cumulative Summer Coincident kW w/ losses (net free) Year 1	1,395
19	Cumulative Summer Coincident kW w/ losses (net free) Year 2	6,973
20	Cumulative Summer Coincident kW w/ losses (net free) Year 3	12,551
21	Cumulative Summer Coincident kW w/ losses (net free) Year 4	18,129
22	Cumulative Summer Coincident kW w/ losses (net free) Year 5	23,708
23	Cumulative kWh w/ losses (net free) Year 1	0
24	Cumulative kWh w/ losses (net free) Year 2	0
25	Cumulative kWh w/ losses (net free) Year 3	0
26	Cumulative kWh w/ losses (net free) Year 4	0
27	Cumulative kWh w/ losses (net free) Year 5	0
28	Per Participant Weighted Average Coincident Saved Winter kW w/ losses	1.0674
29	Per Participant Weighted Average Coincident Saved Summer kW w/ losses	0.6352
30	Per Participant Average Annual kWh w/ losses (net free) Year 1	0
31	Per Participant Average Annual kWh w/ losses (net free) Year 2	0
32	Per Participant Average Annual kWh w/ losses (net free) Year 3	0
33	Per Participant Average Annual kWh w/ losses (net free) Year 4	0
34	Per Participant Average Annual kWh w/ losses (net free) Year 5	0
35	Cumulative Lost Revenue (net free) Year 1	\$0
36	Cumulative Lost Revenue (net free) Year 2	\$0
37	Cumulative Lost Revenue (net free) Year 3	\$0
38	Cumulative Lost Revenue (net free) Year 4	\$0
39	Cumulative Lost Revenue (net free) Year 5	\$0
40	Average Lost Revenue per Participant (net free) Year 1	\$0
41	Average Lost Revenue per Participant (net free) Year 2	\$0
42	Average Lost Revenue per Participant (net free) Year 3	\$0
43	Average Lost Revenue per Participant (net free) Year 4	\$0
44	Average Lost Revenue per Participant (net free) Year 5	\$0
45	Total Avoided Costs/MW saved Year 1	\$172,462
46	Total Avoided Costs/MW saved Year 2	\$169,118
47	Total Avoided Costs/MW saved Year 3	\$174,346
48	Total Avoided Costs/MW saved Year 4	\$179,959
49	Total Avoided Costs/MW saved Year 5	\$185,723
50	Total Avoided Costs/MWh saved Year 1	N/A
51	Total Avoided Costs/MWh saved Year 2	N/A
52	Total Avoided Costs/MWh saved Year 3	N/A
53	Total Avoided Costs/MWh saved Year 4	N/A
54	Total Avoided Costs/MWh saved Year 5	N/A

## Income Qualified Power Manager Load Control Service

### Attachment B Cost-Effectiveness Evaluation

Power Manager Load Control Service for Income Qualified					
		UCT	TRC	RIM	Participant
1	Avoided T&D Electric	\$9,066,505	\$9,066,505	\$9,066,505	\$0
2	Cost-Based Avoided Elec Production	\$0	\$0	\$0	\$0
3	Cost-Based Avoided Elec Capacity	\$6,560,404	\$6,560,404	\$6,560,404	\$0
4	Participant Elec Bill Savings (gross)	\$0	\$0	\$0	\$0
5	Net Lost Revenue Net Fuel	\$0	\$0	\$0	\$0
6	Administration (EM&V) Costs	\$184,149	\$184,149	\$184,149	\$0
7	Implementation Costs	\$3,700,821	\$3,700,821	\$3,700,821	\$0
8	Incentives	\$5,421,348	\$0	\$5,421,348	\$5,421,348
9	Other Utility Costs	\$85,257	\$85,257	\$85,257	\$0
10	Participant Costs (gross)	\$0	\$0	\$0	\$3,459,817
11	Participant Costs (net)	\$0	\$3,459,817	\$0	\$0
12	Total Benefits	\$15,626,909	\$15,626,909	\$15,626,909	\$5,421,348
13	Total Costs	\$9,391,574	\$7,430,043	\$9,391,574	\$3,459,817
14	<b>Benefit/Cost Ratios</b>	<b>1.66</b>	<b>2.10</b>	<b>1.66</b>	<b>1.57</b>
Data represents present value of costs and benefits over the life of the program.					

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## Income Qualified Power Manager Load Control Service

### Attachment C Program Costs by Year

Power Manager Load Control Service for Income Qualified		
1	Incremental Participants Year 1	2,196
2	Incremental Participants Year 2	10,978
3	Incremental Participants Year 3	19,760
4	Incremental Participants Year 4	28,542
5	Incremental Participants Year 5	37,324
6	Total Participant Costs Year 1	\$227,412
7	Total Participant Costs Year 2	\$924,247
8	Total Participant Costs Year 3	\$939,320
9	Total Participant Costs Year 4	\$954,810
10	Total Participant Costs Year 5	\$970,776
11	Administration (EM&V) Costs Year 1	\$9,774
12	Administration (EM&V) Costs Year 2	\$41,084
13	Administration (EM&V) Costs Year 3	\$48,657
14	Administration (EM&V) Costs Year 4	\$55,075
15	Administration (EM&V) Costs Year 5	\$61,492
16	Implementation Costs Year 1	\$176,817
17	Implementation Costs Year 2	\$756,933
18	Implementation Costs Year 3	\$978,072
19	Implementation Costs Year 4	\$1,142,127
20	Implementation Costs Year 5	\$1,306,556
21	Total Incentives Year 1	\$309,109
22	Total Incentives Year 2	\$1,284,475
23	Total Incentives Year 3	\$1,433,319
24	Total Incentives Year 4	\$1,582,580
25	Total Incentives Year 5	\$1,732,317
26	Other Utility Costs Year 1	\$2,760
27	Other Utility Costs Year 2	\$12,795
28	Other Utility Costs Year 3	\$21,471
29	Other Utility Costs Year 4	\$29,045
30	Other Utility Costs Year 5	\$35,716
31	Total Utility Costs Year 1	\$498,460
32	Total Utility Costs Year 2	\$2,095,287
33	Total Utility Costs Year 3	\$2,481,519
34	Total Utility Costs Year 4	\$2,808,827
35	Total Utility Costs Year 5	\$3,136,081

## Income Qualified Power Manager Load Control Service

### Attachment D Program Costs per Participant

Power Manager Load Control Service for Income Qualified		
1	Average Per Participant Administration (EM&V) Costs Year 1	\$4.45
2	Average Per Participant Administration (EM&V) Costs Year 2	\$3.74
3	Average Per Participant Administration (EM&V) Costs Year 3	\$2.46
4	Average Per Participant Administration (EM&V) Costs Year 4	\$1.93
5	Average Per Participant Administration (EM&V) Costs Year 5	\$1.65
6	Average Per Participant Implementation Costs Year 1	\$80.54
7	Average Per Participant Implementation Costs Year 2	\$68.95
8	Average Per Participant Implementation Costs Year 3	\$49.50
9	Average Per Participant Implementation Costs Year 4	\$40.02
10	Average Per Participant Implementation Costs Year 5	\$35.01
11	Average Per Participant Incentives Year 1	\$140.79
12	Average Per Participant Incentives Year 2	\$117.01
13	Average Per Participant Incentives Year 3	\$72.54
14	Average Per Participant Incentives Year 4	\$55.45
15	Average Per Participant Incentives Year 5	\$46.41
16	Average Per Participant Other Utility Costs Year 1	\$1.26
17	Average Per Participant Other Utility Costs Year 2	\$1.17
18	Average Per Participant Other Utility Costs Year 3	\$1.09
19	Average Per Participant Other Utility Costs Year 4	\$1.02
20	Average Per Participant Other Utility Costs Year 5	\$0.96
21	Average Per Participant Total Utility Costs Year 1	\$227.04
22	Average Per Participant Total Utility Costs Year 2	\$190.87
23	Average Per Participant Total Utility Costs Year 3	\$125.59
24	Average Per Participant Total Utility Costs Year 4	\$98.41
25	Average Per Participant Total Utility Costs Year 5	\$84.02

# Income Qualified Power Manager Load Control Service

## Attachment E Program Costs per kW

Power Manager Load Control Service for Income Qualified		
1	Cumulative Winter Coincident kW w/ losses (net free) Year 1	2,343
2	Cumulative Winter Coincident kW w/ losses (net free) Year 2	11,717
3	Cumulative Winter Coincident kW w/ losses (net free) Year 3	21,091
4	Cumulative Winter Coincident kW w/ losses (net free) Year 4	30,464
5	Cumulative Winter Coincident kW w/ losses (net free) Year 5	39,838
6	Cumulative Summer Coincident kW w/ losses (net free) Year 1	1,395
7	Cumulative Summer Coincident kW w/ losses (net free) Year 2	6,973
8	Cumulative Summer Coincident kW w/ losses (net free) Year 3	12,551
9	Cumulative Summer Coincident kW w/ losses (net free) Year 4	18,129
10	Cumulative Summer Coincident kW w/ losses (net free) Year 5	23,708
11	Administration (EM&V) Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 1	\$7.01
12	Administration (EM&V) Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 2	\$5.89
13	Administration (EM&V) Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 3	\$3.88
14	Administration (EM&V) Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 4	\$3.04
15	Administration (EM&V) Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 5	\$2.59
16	Implementation Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 1	\$126.79
17	Implementation Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 2	\$108.55
18	Implementation Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 3	\$77.93
19	Implementation Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 4	\$63.00
20	Implementation Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 5	\$55.11
21	Incentives / Cumulative Summer Coincident kW w/ losses (net free) Year 1	\$221.65
22	Incentives / Cumulative Summer Coincident kW w/ losses (net free) Year 2	\$184.21
23	Incentives / Cumulative Summer Coincident kW w/ losses (net free) Year 3	\$114.20
24	Incentives / Cumulative Summer Coincident kW w/ losses (net free) Year 4	\$87.29
25	Incentives / Cumulative Summer Coincident kW w/ losses (net free) Year 5	\$73.07
26	Other Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 1	\$1.98
27	Other Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 2	\$1.83
28	Other Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 3	\$1.71
29	Other Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 4	\$1.60
30	Other Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 5	\$1.51
31	Total Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 1	\$357.43
32	Total Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 2	\$300.49
33	Total Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 3	\$197.71
34	Total Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 4	\$154.93
35	Total Utility Costs / Cumulative Summer Coincident kW w/ losses (net free) Year 5	\$132.28
36	Administration (EM&V) Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 1	\$4.17
37	Administration (EM&V) Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 2	\$3.51
38	Administration (EM&V) Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 3	\$2.31
39	Administration (EM&V) Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 4	\$1.81
40	Administration (EM&V) Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 5	\$1.54
41	Implementation Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 1	\$75.45
42	Implementation Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 2	\$64.60
43	Implementation Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 3	\$46.37
44	Implementation Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 4	\$37.49
45	Implementation Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 5	\$32.80
46	Incentives / Cumulative Winter Coincident kW w/ losses (net free) Year 1	\$131.91
47	Incentives / Cumulative Winter Coincident kW w/ losses (net free) Year 2	\$109.63
48	Incentives / Cumulative Winter Coincident kW w/ losses (net free) Year 3	\$67.96
49	Incentives / Cumulative Winter Coincident kW w/ losses (net free) Year 4	\$51.95
50	Incentives / Cumulative Winter Coincident kW w/ losses (net free) Year 5	\$43.48
51	Other Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 1	\$1.18
52	Other Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 2	\$1.09
53	Other Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 3	\$1.02
54	Other Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 4	\$0.95
55	Other Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 5	\$0.90
56	Total Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 1	\$212.71
57	Total Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 2	\$178.83
58	Total Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 3	\$117.66
59	Total Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 4	\$92.20
60	Total Utility Costs / Cumulative Winter Coincident kW w/ losses (net free) Year 5	\$78.72

## Income Qualified Power Manager Load Control Service

### Attachment F Program Costs per kWh

Power Manager Load Control Service for Income Qualified		
1	Cumulative kWh w/ losses (net free) Year 1	0
2	Cumulative kWh w/ losses (net free) Year 2	0
3	Cumulative kWh w/ losses (net free) Year 3	0
4	Cumulative kWh w/ losses (net free) Year 4	0
5	Cumulative kWh w/ losses (net free) Year 5	0
6	Administration (EM&V) Costs / Cumulative kWh w/ losses (net free) Year 1	N/A
7	Administration (EM&V) Costs / Cumulative kWh w/ losses (net free) Year 2	N/A
8	Administration (EM&V) Costs / Cumulative kWh w/ losses (net free) Year 3	N/A
9	Administration (EM&V) Costs / Cumulative kWh w/ losses (net free) Year 4	N/A
10	Administration (EM&V) Costs / Cumulative kWh w/ losses (net free) Year 5	N/A
11	Implementation Costs / Cumulative kWh w/ losses (net free) Year 1	N/A
12	Implementation Costs / Cumulative kWh w/ losses (net free) Year 2	N/A
13	Implementation Costs / Cumulative kWh w/ losses (net free) Year 3	N/A
14	Implementation Costs / Cumulative kWh w/ losses (net free) Year 4	N/A
15	Implementation Costs / Cumulative kWh w/ losses (net free) Year 5	N/A
16	Incentives / Cumulative kWh w/ losses (net free) Year 1	N/A
17	Incentives / Cumulative kWh w/ losses (net free) Year 2	N/A
18	Incentives / Cumulative kWh w/ losses (net free) Year 3	N/A
19	Incentives / Cumulative kWh w/ losses (net free) Year 4	N/A
20	Incentives / Cumulative kWh w/ losses (net free) Year 5	N/A
21	Other Utility Costs / Cumulative kWh w/ losses (net free) Year 1	N/A
22	Other Utility Costs / Cumulative kWh w/ losses (net free) Year 2	N/A
23	Other Utility Costs / Cumulative kWh w/ losses (net free) Year 3	N/A
24	Other Utility Costs / Cumulative kWh w/ losses (net free) Year 4	N/A
25	Other Utility Costs / Cumulative kWh w/ losses (net free) Year 5	N/A
26	Total Utility Costs / Cumulative kWh w/ losses (net free) Year 1	N/A
27	Total Utility Costs / Cumulative kWh w/ losses (net free) Year 2	N/A
28	Total Utility Costs / Cumulative kWh w/ losses (net free) Year 3	N/A
29	Total Utility Costs / Cumulative kWh w/ losses (net free) Year 4	N/A
30	Total Utility Costs / Cumulative kWh w/ losses (net free) Year 5	N/A

**Attachment G**  
Tariff

See attached.

## RESIDENTIAL INCOME-QUALIFIED POWER MANAGER LOAD CONTROL PROGRAM RIQLC (NC)

### PURPOSE

The purpose of this program is to provide income-qualified customers with equipment to facilitate participation in the Company's demand response program.

### PROGRAM

The program is available to individually metered residential customers who have participated in the Company's income-qualified programs, including, but not limited to, income-qualified energy efficiency programs, within the 36 months preceding the date of enrollment. Participating Customers agree to allow the Company to interrupt service to an installed, approved electric heat pump(s) used for cooling and/or approved electric heating source providing primary or backup electric resistance heat. Customers may choose to participate via one of the following options: (1) a Load Control Device(s) provided by the Company, (2) the installation of an eligible thermostat(s) by the Company which will be Customer-owned following enrollment, or (3) the enrollment of an eligible Customer-owned thermostat(s). Participants can only be enrolled in one option at a time.

Customers choosing the Load Control Device(s) option agree to allow the Company or its representative to install and operate the necessary control equipment in a suitable location in or about the residence. The Load Control Device(s) option is only available in areas where load control signal can be satisfactorily received. Renters must have the owner's consent to participate in the Load Control Device(s) option.

Customers choosing either thermostat option must (1) occupy the residence, (2) have control of the approved central air conditioning and/or central heating units, and (3) must have the thermostat(s) configured in a manner which allows the Company to communicate and control Customer's equipment remotely.

Under the provisions of this Program, the Company shall be allowed to monitor the operation of load-controlling equipment as well as the Customer's energy usage and the operation of the controlled devices.

### ELIGIBILITY

Customers choosing the Load Control Device(s) option must have a heat pump or central air conditioning unit with ducted electric resistance heating elements.

Customers choosing either thermostat option must have the following:

- A heat pump or central air conditioning unit with ducted electric resistance heating elements.
- Wi-Fi internet access in the residence.

Customers in a residence that has Wi-Fi/internet access and that has participated in one of the Company's income-qualified programs, including, but not limited to, income-qualified energy efficiency programs, within the 36 months preceding the date of enrollment may qualify to receive a smart thermostat installed and registered with the thermostat manufacturer at no cost to the Customer.

All air conditioning and/or heating units installed at the residence must participate in load control to be enrolled in the program.

### PAYMENT OF INCENTIVES

Load Control Device Participants:

Load Control Device participants will receive a monthly incentive for the billing months of January through April in the amount of \$6 per month.

Thermostat Participants:

Thermostat participants will receive an Initial Incentive Payment following the successful installation and enrollment of the participating Customer's thermostat(s) in the amount of \$75. Following each twelve months of continuous participation on the thermostat option, Customers will receive an Annual Incentive in the amount of \$25. Incentives may be offered in a variety of ways, including, but not limited to bill credits, checks, and prepaid credit cards.

**RESIDENTIAL INCOME-QUALIFIED POWER MANAGER LOAD CONTROL  
PROGRAM RIQLC (NC)****INTERRUPTION****Load Control Device Participants:**

Company shall be allowed, at its discretion, to interrupt service to each heating system for up to four hours during each day of the winter control season months of December through March. Heating unit interruptions shall be limited to a total of 60 hours during any one winter season. Company reserves the right for interruption outside of these parameters in the event continuity of service is threatened.

**Thermostat Participants:**

Company shall be allowed, at its discretion, to interrupt service to each heating system for up to four hours during each day of the winter control season months of December through March. Heating unit interruptions shall be limited to a total of 45 hours during any one winter season. Interruptions of heating and/or cooling systems for the remainder of the year are limited to a total of 15 hours. Company reserves the right for interruption outside of these parameters in the event continuity of service is threatened.

**EQUIPMENT INSPECTION AND SERVICING**

The Company or its agents shall have the right of ingress and egress to Customer's premises at all reasonable hours for the purpose of inspecting Load Control Device(s) wiring and apparatus; changing, exchanging, or repairing its property, as necessary; or removing its property after termination of service. The Company and Customer shall schedule a convenient time for such purposes whenever it is necessary to service the Company's equipment installed inside the residence. If any tampering with Company-owned equipment occurs, Company may adjust the billing and take other action in accordance with the Rules and Regulations of the North Carolina Utilities Commission and the laws of the State of North Carolina as applicable to meter tampering.

**TESTING AND OPTING OUT OF EVENTS**

The Company reserves the right to test the load control functionality at any time, and such test periods shall be counted toward the maximum hourly interruption limit. The Customer shall have the option to opt out of control events; however, if the Customer opts out of more than two (2) control event in a single winter or summer control season, the Customer may be subject to removal from the program and forfeit program incentives. A control event opt-out includes non-participation in any part of the interruption time period. If the Company is unable to communicate with Customer's thermostat(s) during a load control event, it will be counted as an event opt-out.

**CONTRACT PERIOD**

The Contract Period shall not be less than one year. Customer or Company may terminate participation under the Rider by providing 30-day notice to the other party.

**COMPANY RETENTION OF PROGRAM BENEFITS**

Incentives and other considerations offered under the terms of this Program are understood to be an essential element in the recipient's decision to participate in the Program. Upon payment of these considerations, the Company will be entitled to any and all environmental, energy efficiency, and demand reduction benefits and attributes, including all reporting and compliance rights, associated with participation in the Program.