

Credit Ratings - Dr. Woolridge's Proxy Group

Company	Ticker	Moody's Long-Term Issuer	Moody's Corporate Long-Term	S&P Long-Term Issuer	S&P Corporate Long-Term
ALLETE, Inc.	ALE	Baa1	Baa1	BBB+	BBB+
Superior Water, Light and Power Company		A3			
Alliant Energy Corporation	LNT	Baa2	Baa2	A-	A-
Interstate Power and Light Company		Baa1	Baa1	A-	A-
Wisconsin Power and Light Company		A3	A3	A	A
Ameren Corporation	AEE	Baa1	Baa1	BBB+	BBB+
Ameren Illinois Company		A3	A3	BBB+	BBB+
Union Electric Company		Baa1	Baa1	BBB+	BBB+
American Electric Power Company, Inc.	AEP		Baa1	A-	A-
AEP Texas Inc.		Baa1	Baa1	A-	A-
Appalachian Power Company		Baa1	Baa1	A-	A-
Indiana Michigan Power Company		A3	A3	A-	A-
Kentucky Power Company		Baa3	Baa3	A-	A-
Ohio Power Company		A2	A2	A-	A-
Public Service Company of Oklahoma		A3	A3	A-	A-
Southwestern Electric Power Company		Baa2	Baa2	A-	A-
Avangrid, Inc.	AGR	Baa1	Baa1	BBB+	BBB+
New York State Electric & Gas Corporation		A3	A3	A-	A-
United Illuminating Company		Baa1	Baa1	A-	A-
Rochester Gas and Electric Corporation		A3	A3	A-	A-
Central Maine Power Company		A2	A2	A	A
Avista Corporation	AVA	Baa2		BBB	
Alaska Electric Light and Power		Baa3	Baa3		
CMS Energy Corporation	CMS		Baa1	BBB+	BBB+
Consumers Energy Company			(P)A2	A-	A-
Consolidated Edison, Inc.	ED	Baa2	Baa2	A-	A-
Consolidated Edison Company of New York, Inc.		Baa1	Baa1	A-	A-
Orange and Rockland Utilities, Inc.		Baa1	Baa1	A-	A-
Rockland Electric				A-	A-
Dominion Energy, Inc.	D		Baa2	BBB+	BBB+
Dominion Energy South Carolina, Inc.		Baa2	Baa2	BBB+	BBB+
Virginia Electric and Power Company		A2	A2	BBB+	BBB+
Duke Energy Corporation	DUK	Baa1	Baa1	A-	A-
Duke Energy Carolinas, LLC		A1	A1	A-	A-
Duke Energy Florida, LLC		A3	A3	A-	A-
Duke Energy Indiana, LLC		A2	A2	A-	A-
Duke Energy Kentucky, Inc.			Baa1	A-	A-
Duke Energy Ohio, Inc.		Baa1	Baa1	A-	A-
Duke Energy Progress, LLC		A2	A2	A-	A-
Edison International	EIX	Baa3	Baa3	BBB	BBB
Southern California Edison Company		Baa2	Baa2	BBB	BBB
Entergy Corporation	ETR	Baa2	Baa2	BBB+	BBB+
Entergy Arkansas, LLC		Baa1	Baa1	A-	A-
Entergy Louisiana, LLC		Baa1	Baa1	A-	A-
Entergy Mississippi, LLC		Baa1	Baa1	A-	A-
Entergy New Orleans, LLC		Ba1	Ba1	BBB+	BBB+
Entergy Texas, Inc.		Baa3	Baa3	BBB+	BBB+
Eversource Energy	EVRG	Baa2	Baa2	A-	A-
Eversource Kansas Central, Inc.		Baa1	Baa1	A-	A-
Eversource Kansas South, Inc.		Baa1	Baa1	A-	A-
Eversource Metro, Inc.		Baa1	Baa1	A-	A-
Eversource Missouri West, Inc.		Baa2	Baa2	A-	A-
Eversource Energy	ES	Baa1	Baa1	A-	A-
Connecticut Light and Power Company		A3	A3	A	A
NSTAR Electric Company		A1	A1	A	A
Public Service Company of New Hampshire		A3	A3	A	A

DEC Moody's A1 - Total of Five - A1

DEP Moody's A2 - Total of 11 - A2

Remaining 62 A3 or lower

Credit Ratings - Dr. Woolridge's Proxy Group

Company	Ticker	Moody's Long-Term Issuer	Moody's Corporate Long-Term	S&P Long-Term Issuer	S&P Corporate Long-Term
Exelon Corporation	EXC	Baa2	Baa2	BBB+	BBB+
Atlantic City Electric Company		Baa1	Baa1	A-	A-
Baltimore Gas and Electric Company		A3	A3	A	A
Commonwealth Edison Company		A3	A3	A-	A-
Delmarva Power & Light Company		Baa1	Baa1	A-	A-
PECO Energy Co.		A2	A2	BBB+	BBB+
Potomac Electric Power Company		Baa1	Baa1	A-	A-
FirstEnergy Corp.	FE	Baa3	Baa3	BBB	BBB
Cleveland Electric Illuminating Company		Baa2	Baa2	BBB	BBB
Jersey Central Power & Light Company		Baa1	Baa1	BBB	BBB
Metropolitan Edison Company		A3	A3	BBB	BBB
Monongahela Power Company		Baa2	Baa2	BBB	BBB
Ohio Edison Company		A3	A3	BBB	BBB
Pennsylvania Electric Company		Baa1	Baa1	BBB	BBB
Pennsylvania Power Company		A3	A3	BBB	BBB
Potomac Edison Company		Baa2	Baa2	BBB	BBB
Toledo Edison Company		Baa1	Baa1	BBB	BBB
West Penn Power Company		A3	A3	BBB	BBB
Hawaiian Electric Industries, Inc.	HE			BBB-	BBB-
Hawaiian Electric Company, Inc.		Baa2	Baa2	BBB-	BBB-
Hawaii Electric Light Company				BBB-	BBB-
Maui Electric Company, Ltd				BBB-	BBB-
IDACORP, Inc.	IDA	Baa1	Baa1	BBB	BBB
Idaho Power Company		A3	A3	BBB	BBB
MGE Energy, Inc.	MGEE				
Madison Gas and Electric Company		A1	A1	AA-	AA-
NextEra Energy, Inc.	NEE	Baa1	Baa1	A-	A-
Florida Power & Light Company		A1	A1	A	A
Gulf Power Company		A2	A2	A	A
NorthWestern Corporation	NWE		Baa2	BBB	BBB
OGE Energy Corp.	OGE		(P)Baa1	BBB+	BBB+
Oklahoma Gas and Electric Company		A3	A3	A-	A-
Otter Tail Corporation	OTTR	Baa2	Baa2	BBB	BBB
Otter Tail Power Company		A3	A3	BBB+	BBB+
Pinnacle West Capital Corporation	PNW	A3	A3	A-	A-
Arizona Public Service Company		A2	A2	A-	A-
PNM Resources, Inc.	PNM	Baa3	Baa3	BBB	BBB
Public Service Company of New Mexico		Baa2	Baa2	BBB	BBB
Texas-New Mexico Power Company		A3	A3	BBB+	BBB+
Portland General Electric Company	POR	A3	A3	BBB+	BBB+
PPL Corporation	PPL	Baa2	Baa2	A-	A-
Kentucky Utilities Company		A3	A3	A-	A-
LG&E and KU Energy LLC		Baa1	Baa1	A-	A-
Louisville Gas and Electric Company		A3	A3	A-	A-
PPL Electric Utilities Corporation		A3	A3	A-	A-
Sempra Energy	SRE	Baa1	Baa1	BBB+	BBB+
Oncor Electric Delivery Company LLC			A2	A	A
San Diego Gas & Electric Company		Baa1	Baa1	BBB+	BBB+
Southern Company	SO		Baa2	A-	A-
Alabama Power Company		A1	A1	A	A
Georgia Power Company		Baa1	Baa1	A-	A-
Mississippi Power Company		Baa2	Baa2	A-	A-
WEC Energy Group, Inc.	WEC	Baa1	Baa1	A-	A-
Wisconsin Electric Power Company		A2	A2	A-	A-
Wisconsin Public Service Corporation		A2	A2	A-	A-
Xcel Energy Inc.	XEL	Baa1	Baa1	A-	A-
Northern States Power Company - MN		A2	A2	A-	A-
Northern States Power Company - WI			(P)A2	A-	A-
Public Service Company of Colorado		A3		A-	A-
Southwestern Public Service Company		Baa2	Baa2	A-	A-

Source: S&P Global Market Intelligence

Duke Energy Progress
DOCKET NO. E-2, SUB 1219

PUBLIC STAFF EXHIBIT

STOCK PRICE CLOSE

	<u>Duke Energy Corporation</u>	<u>S&P 500 Index</u>
February 21, 2020	\$101.43	3,338
February 24 ¹	102.30	3,226
February 25	99.25	3,128
February 26	98.94	3,116
February 27	94.99	2,979
February 28	91.70	2,954
March 2	96.67	3,090
March 3	95.61	3,003
March 4	101.65	3,130
March 5	100.13	3,024
March 6	99.05	2,972
March 9	94.58	2,747
March 10	95.05	2,882
March 11	90.94	2,741
March 12	80.48	2,481
March 13	85.75	2,711
March 16	76.58	2,386
March 17	86.00	2,529
March 18	79.28	2,398
March 19	75.05	2,409
March 20	68.40	2,305

¹ Issuance of Commission February 24, 2020 Dominion Energy North Carolina order in Docket No. E-22, Sub 562.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d) of the
Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): **September 9, 2020**

Commission file number	Registrant, State of Incorporation or Organization, Address of Principal Executive Offices, and Telephone Number	IRS Employer Identification No.
1-32853	 DUKE ENERGY CORPORATION (a Delaware corporation) 550 South Tryon Street Charlotte, North Carolina 28202-1803 704-382-3853	20-2777218

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- ☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- ☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- ☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- ☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock, \$0.001 par value	DUK	New York Stock Exchange LLC
5.125% Junior Subordinated Debentures due January 15, 2073	DUKH	New York Stock Exchange LLC
5.625% Junior Subordinated Debentures due September 15, 2078	DUKB	New York Stock Exchange LLC
Depository Shares, each representing a 1/1,000 th interest in a share of 5.75% Series A Cumulative Redeemable Perpetual Preferred Stock, par value \$0.001 per share	DUK PR A	New York Stock Exchange LLC

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Item 7.01. Regulation FD Disclosure.

On September 9, 2020, Duke Energy Corporation posted an investor presentation to its website at www.duke-energy.com/our-company/investors. A copy of these slides is attached hereto as Exhibit 99.1. The information in Exhibit 99.1 is being furnished pursuant to this Item 7.01. In accordance with General Instruction B.2 of Form 8-K, the information in Item 7.01 of this Current Report on Form 8-K, including Exhibit 99.1, shall not be deemed "filed" for the purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liabilities of that section.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

99.1 September 2020 Investor Update of Duke Energy Corporation dated September 9, 2020 (furnished pursuant to Item 7.01)

104 Cover Page Interactive Data File (embedded within the Inline XBRL document).

I/A

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

DUKE ENERGY CORPORATION

Date: September 9, 2020

By: /s/ David S. Maltz

Name: David S. Maltz

Title: Vice President, Legal, Chief Governance Officer and Assistant Corporate Secretary

I/A



Safe Harbor statement

This presentation includes forward-looking statements within the meaning of the federal securities laws. Actual results could differ materially from such forward-looking statements. The factors that could cause actual results to differ are discussed herein and in Duke Energy's SEC filings, available at www.sec.gov.

Regulation G disclosure

In addition, today's discussion includes certain non-GAAP financial measures as defined under SEC Regulation G. A reconciliation of those measures to the most directly comparable GAAP measures is available in the Appendix herein and on our Investor Relations website at www.duke-energy.com/investors/.

Safe harbor statement

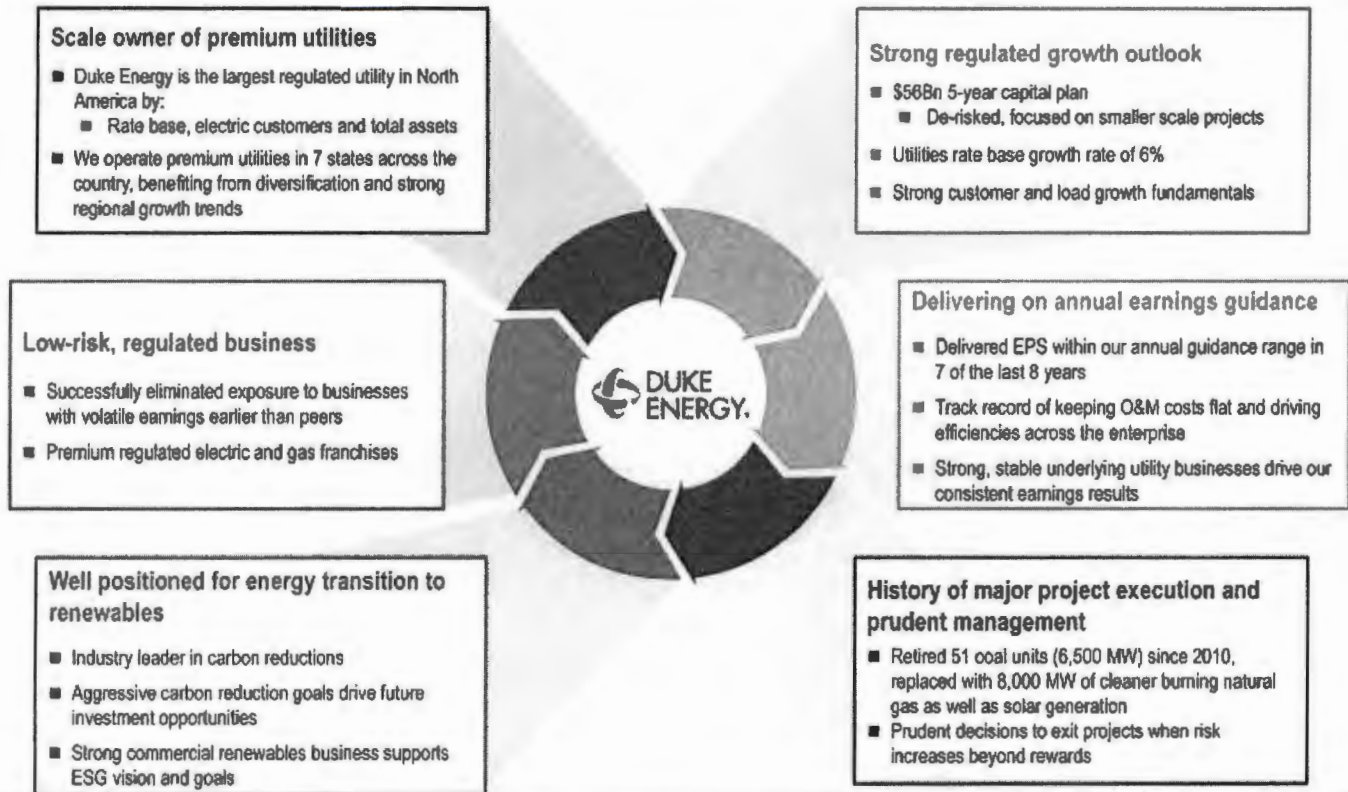
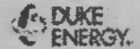


This document includes forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. Forward-looking statements are based on management's beliefs and assumptions and can often be identified by terms and phrases that include "anticipate," "believe," "intend," "estimate," "expect," "continue," "should," "could," "may," "plan," "project," "predict," "will," "potential," "forecast," "target," "guidance," "outlook" or other similar terminology. Various factors may cause actual results to be materially different than the suggested outcomes within forward-looking statements; accordingly, there is no assurance that such results will be realized. These factors include, but are not limited to: The impact of the COVID-19 pandemic; State, federal and foreign legislative and regulatory initiatives, including costs of compliance with existing and future environmental requirements, including those related to climate change, as well as rulings that affect cost and investment recovery or have an impact on rate structures or market prices; The extent and timing of costs and liabilities to comply with federal and state laws, regulations and legal requirements related to coal ash remediation, including amounts for required closure of certain ash impoundments, are uncertain and difficult to estimate; The ability to recover eligible costs, including amounts associated with coal ash impoundment retirement obligations and costs related to significant weather events, and to earn an adequate return on investment through rate case proceedings and the regulatory process; The costs of decommissioning nuclear facilities could prove to be more extensive than amounts estimated and all costs may not be fully recoverable through the regulatory process; Costs and effects of legal and administrative proceedings, settlements, investigations and claims; Industrial, commercial and residential growth or decline in service territories or customer bases resulting from sustained downturns of the economy and the economic health of our service territories or variations in customer usage patterns, including energy efficiency efforts and use of alternative energy sources, such as self-generation and distributed generation technologies; Federal and state regulations, laws and other efforts designed to promote and expand the use of energy efficiency measures and distributed generation technologies, such as private solar and battery storage, in Duke Energy service territories could result in customers leaving the electric distribution system, excess generation resources as well as stranded costs; Advancements in technology; Additional competition in electric and natural gas markets and continued industry consolidation; The influence of weather and other natural phenomena on operations, including the economic, operational and other effects of severe storms, hurricanes, droughts, earthquakes and tornadoes, including extreme weather associated with climate change; The ability to successfully operate electric generating facilities and deliver electricity to customers including direct or indirect effects to the company resulting from an incident that affects the U.S. electric grid or generating resources; The ability to obtain the necessary permits and approvals and to complete necessary or desirable pipeline expansion or infrastructure projects in our natural gas business; Operational interruptions to our natural gas distribution and transmission activities; The availability of adequate interstate pipeline transportation capacity and natural gas supply; The impact on facilities and business from a terrorist attack, cybersecurity threats, data security breaches, operational accidents, information technology failures or other catastrophic events, such as fires, explosions, pandemic health events or other similar occurrences. The inherent risks associated with the operation of nuclear facilities, including environmental, health, safety, regulatory and financial risks, including the financial stability of third-party service providers; The timing and extent of changes in commodity prices and interest rates and the ability to recover such costs through the regulatory process, where appropriate, and their impact on liquidity positions and the value of underlying assets; The results of financing efforts, including the ability to obtain financing on favorable terms, which can be affected by various factors, including credit ratings, interest rate fluctuations, compliance with debt covenants and conditions and general market and economic conditions; Credit ratings of the Duke Energy Registrants may be different from what is expected; Declines in the market prices of equity and fixed-income securities and resultant cash funding requirements for defined benefit pension plans, other post-retirement benefit plans and nuclear decommissioning trust funds; Construction and development risks associated with the completion of the Duke Energy Registrants' capital investment projects, including risks related to financing, obtaining and complying with terms of permits, meeting construction budgets and schedules and satisfying operating and environmental performance standards, as well as the ability to recover costs from customers in a timely manner, or at all; Changes in rules for regional transmission organizations, including changes in rate designs and new and evolving capacity markets, and risks related to obligations created by the default of other participants; The ability to control operation and maintenance costs; The level of creditworthiness of counterparties to transactions; The ability to obtain adequate insurance at acceptable costs; Employee workforce factors, including the potential inability to attract and retain key personnel; The ability of subsidiaries to pay dividends or distributions to Duke Energy Corporation holding company (the Parent); The performance of projects undertaken by our nonregulated businesses and the success of efforts to invest in and develop new opportunities; The effect of accounting pronouncements issued periodically by accounting standard-setting bodies; The impact of U.S. tax legislation to our financial condition, results of operations or cash flows and our credit ratings; The impacts from potential impairments of goodwill or equity method investment carrying values; and the ability to implement our business strategy, including enhancing existing technology systems.

Additional risks and uncertainties are identified and discussed in the Duke Energy Registrants' reports filed with the SEC and available at the SEC's website at sec.gov. In light of these risks, uncertainties and assumptions, the events described in the forward-looking statements might not occur or might occur to a different extent or at a different time than described. Forward-looking statements speak only as of the date they are made and the Duke Energy Registrants expressly disclaim an obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

I/A

Our Long-Term Investor Value Proposition



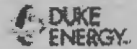


Carolinas IRP Highlights



SEPTEMBER INVESTOR UPDATE Q4/10

Duke Energy's clean energy future vision for the Carolinas



Carolinas IRPs illustrate multiple pathways to a **cleaner energy future**

Collaborated with over 200 **Stakeholders** to help shape **path to achieve** our climate goals

KEY MESSAGES

- Carolinas Integrated Resource Plans (IRP) filed Sept. 1 include six portfolios
 - **Base case has a least cost standard⁽¹⁾**, following current energy policy
 - Other portfolios present options for accelerated decarbonization, a Duke Energy priority with emerging support in the Carolinas
 - All portfolios represent **significant capital opportunities**
- Renewables take center stage in five of six pathways, while natural gas continues to play a vital role
 - **Renewables and storage additions average 16,000 MW** across the six portfolios, with gas additions averaging 6,500 MW
 - **Dispatchable resources are needed** to support significant renewables additions (recent example in California)
 - **Winter peak in the Carolinas** necessitates natural gas generation to supply power on early/dark mornings in January and February
 - Multiple **third party studies⁽¹⁾ support the role of natural gas** enabling a cost-effective transition to de-carbonization



DESTINATION
 => 50% REDUCTION IN CO₂
 EMISSIONS BY 2030 AND
NET-ZERO BY 2050

(1) See appendix slides for additional information

2030 CARBON REDUCTION IN CAROLINAS WILL RANGE FROM 56% TO 74%

Carolinas IRPs: Summary Results



Pathway	Base without Carbon Policy		Base with Carbon Policy		Earliest Practicable Coal Retirements		70% CO ₂ Reduction: High Wind		70% CO ₂ Reduction: High Small Modular Reactor (SMR)		No New Gas Generation	
	A		B		C		D		E		F	
System CO ₂ Reduction (2030 2035)	56%	53%	59%	62%	64%	64%	70%	73%	71%	74%	65%	73%
Present Value Revenue Requirement (PVRR) [\$B] (through 2050) ¹	\$79.8		\$82.5		\$84.1		\$100.5		\$95.5		\$108.1	
Estimated Transmission Investment Required [\$B] ²	\$0.9		\$1.8		\$1.3		\$7.5		\$3.1		\$8.9	
Total Solar [MW] ^{3, 4}	8,650		12,300		12,400		16,250		16,250		16,400	
Incremental Onshore Wind [MW] ³	0		750		1,350		2,850		2,850		3,150	
Incremental Offshore Wind [MW] ³	0		0		0		2,650		250		2,650	
Incremental SMR Capacity [MW] ⁴	0		0		0		0		1,350		700	
Incremental Storage [MW] ^{3, 5}	1,050		2,200		2,200		4,400		4,400		7,400	
Incremental Gas [MW] ³	9,600		7,350		9,600		6,400		6,100		0	
Total Contribution from Energy Efficiency and Demand Response Initiatives [MW] ⁶	2,050		2,050		2,050		3,350		3,350		3,350	
Dependency on Technology & Policy Advancement												

¹ PVRR includes the cost of CO₂ as tax, including CO₂ costs as forecasted through 2050, by \$11-\$16/B through 2050.

² Represents an estimated nominal transmission investment cost as included in PVRR calculation.

³ All capacities are Total/Incremental nameplate capacity within the IRP planning horizon.

⁴ Total solar nameplate capacity includes 3,925 MW connected in DEC and DEP combined as of year-end 2020 (projected).

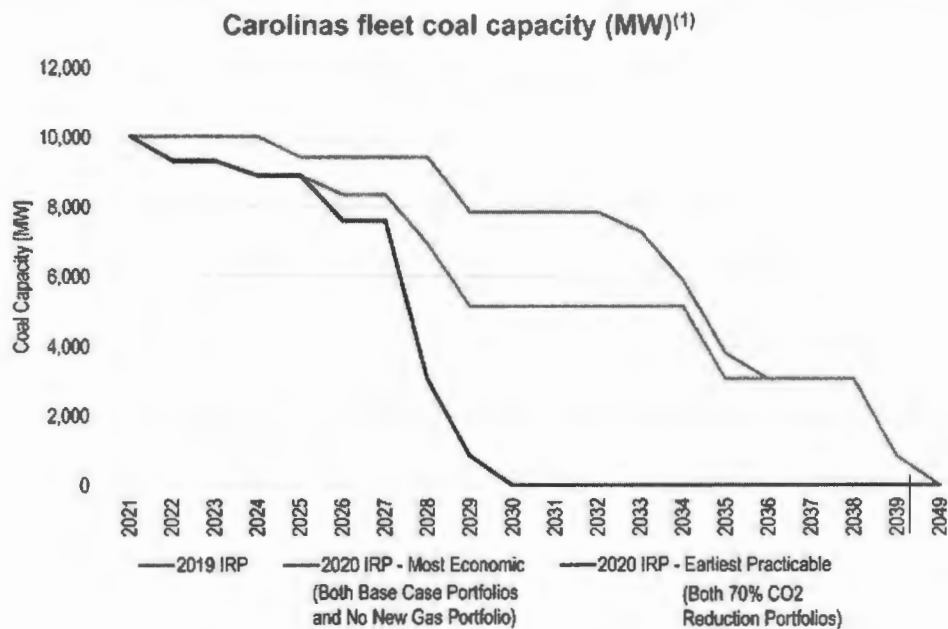
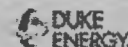
⁵ Includes 4-hr, 8-hr, and 16-hr grid-tied storage, storage at select plus storage sites, and pumped storage.

⁶ Contribution of ELDR (including Integrated Volt-Var Control (IVVC) and Distribution System Demand Response (DSDR)) in 2035 to peak winter planning hour.

LEGEND:

- Completely dependent
- Moderately dependent
- Moderately dependent
- Slightly dependent
- Not dependent

Coal retirements by portfolio



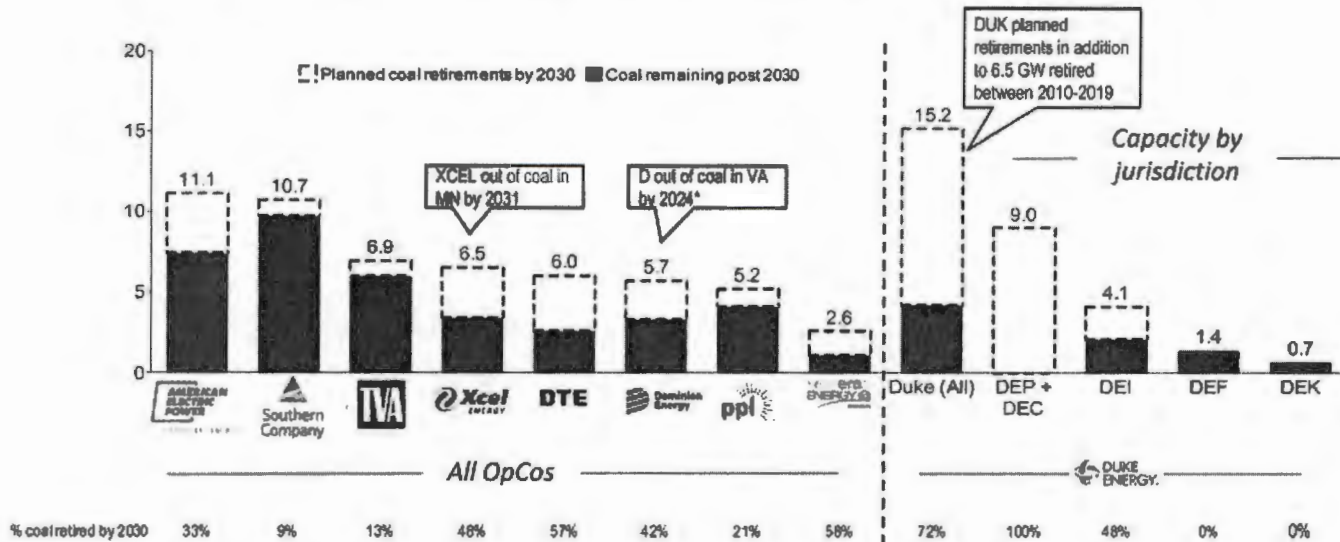
(1) In Earliest Practicable scenario, Dual fuel unit Cliffside 6 operates on natural gas only starting in 2030

2020 IRPS ACCELERATE COAL RETIREMENTS AS A BASELINE, AND PROVIDE POTENTIAL FOR SIGNIFICANT ACCELERATION

IRP contemplates the largest coal closure in the industry over the next decade



2019 active coal nameplate capacity and planned retirements by 2030 (GW)

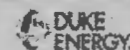


Note: *Coal co-owned with a cooperative utility and Virginia City Hybrid Energy Center are exceptions; TVA sites potential to retire additional 2.2GW coal if cost-effective; Dominion SCE&G IRP explored additional 1.3GW retirements; DEI capacity excludes Edwardsport IGCC; Duke Carolinas retirement schedule based on "Earliest Practicable" scenario detailed in 2020 IRP
 Source: SNL 2019 active nameplate capacity (operating plants based on ownership % and fuel categorization, may exclude dual fuel w/ non-coal firing); planned coal retirements based on company latest IRP, utility commission reports, sustainability reports, and news releases

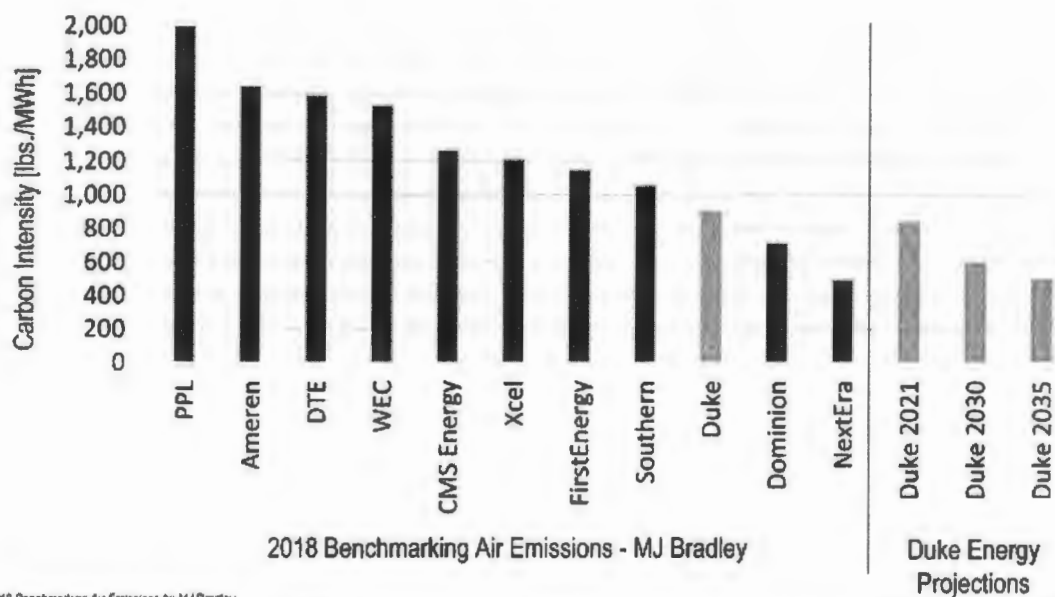
PLANNED RETIREMENTS IN ADDITION TO 51 UNITS (6,500 MW) RETIRED SINCE 2010

SEPTEMBER INVESTOR UPDATE 2020

National Leader in Low Carbon Intensity Energy



Carbon Intensity Benchmarks and Duke Energy Projections



Source: 2018 Benchmarking Air Emissions by MJ Bradley

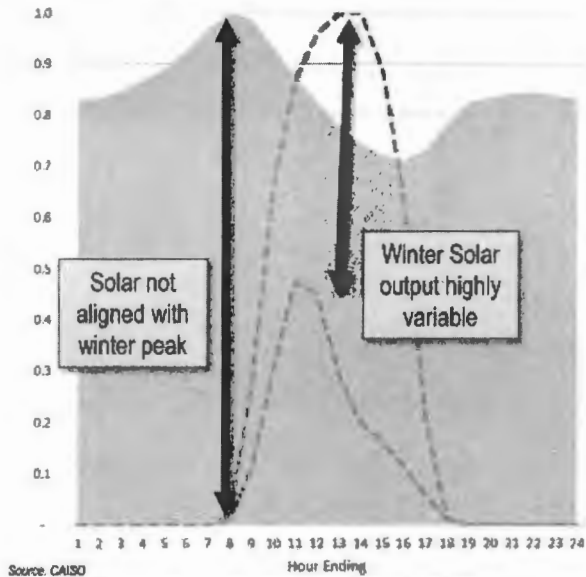
CARBON INTENSITY RATE OF THE DEC/DEP COMBINED FLEET IS 37% LOWER THAN THE INDUSTRY AVERAGE

Serving the Carolinas Winter Peak

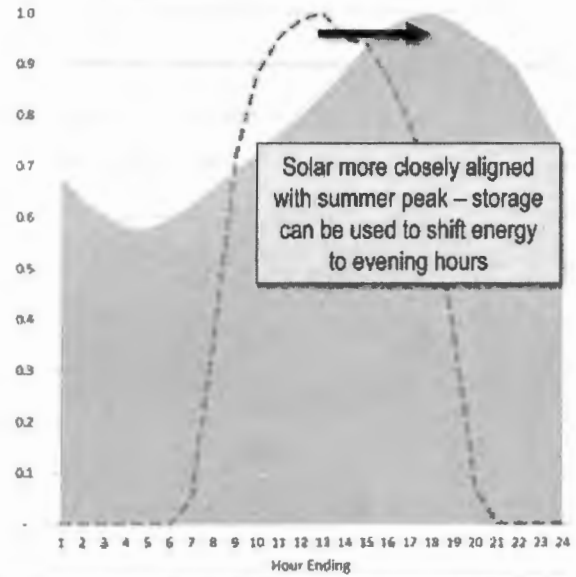


--- Solar Generation ■ Load

Carolinas: winter peaking



California: summer peaking

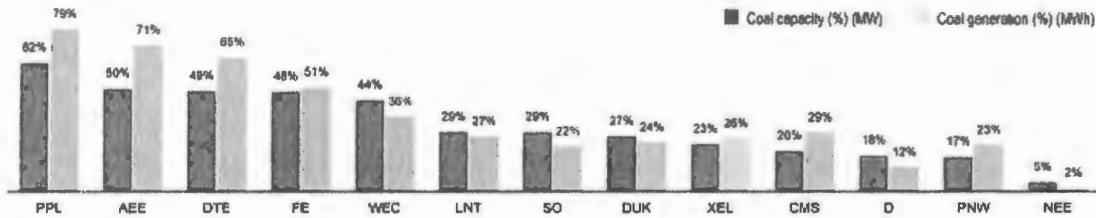


**SOLAR + STORAGE INSUFFICIENT TO MEET WINTER PEAK IN THE CAROLINAS;
NATURAL GAS GENERATION NEEDED TO SUPPLY POWER ON COLD/DARK MORNINGS**

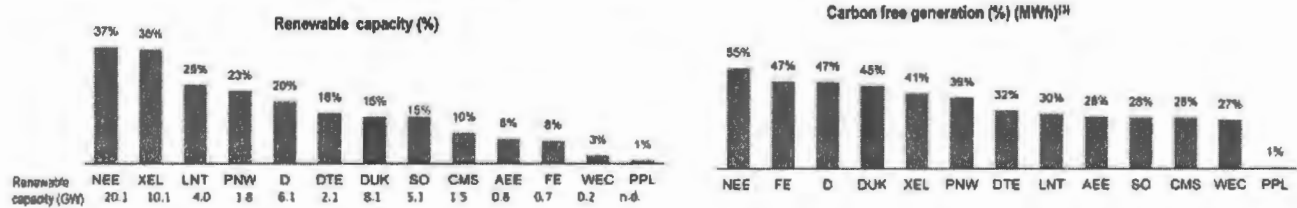
Environmental track record



Duke is less "coal-heavy" than other utilities and has done more to reduce its carbon footprint⁽¹⁾



Duke has significantly expanded into renewables, in line with peers⁽¹⁾⁽²⁾



Source: S&P, Company filings. Note: Generation mix includes owned and purchased power

(1) AEE and FE data reflects 2019 generation data given lack of disclosure

(2) Represents renewables (commercial and regulated, including conventional hydro) + nuclear capacity and inclusive PPAs in addition to owned generation

(3) DUK excludes pumped storage hydro capacity / generation (includes conventional hydro and purchased renewable power)

STRONG TRACK RECORD OF CARBON REDUCTION IN LINE WITH INDUSTRY PEERS



Premium Utility Franchises With Attractive Fundamentals



SEPTEMBER 2016/2017 UPDATE 205

Duke Completed Its Portfolio Transition Ahead of Peers



CURRENT INDUSTRY THEMES



Divestiture of merchant
businesses

Announced exit from Midwest generation in 2014

Regulated business M&A

Announced acquisition of Piedmont in 2015

Divestiture of international
businesses

*Announced exit from Duke Energy International
business in 2016*

ESG focus

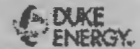
Announced net-zero carbon goal in 2019

Focus on O&M cost
management

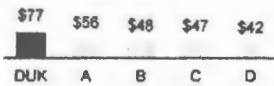
Kept O&M flat since 2016

TODAY'S DUKE ENERGY IS A WELL-RUN REGULATED ELECTRIC AND GAS UTILITY

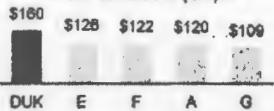
Duke Energy Is The Largest Regulated Utility In North America



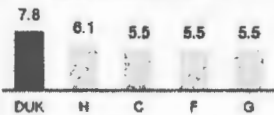
NORTH AMERICAN RATE BASE AS OF 12/31/2019 (\$B)⁽¹⁾



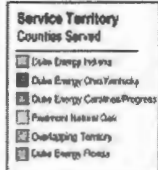
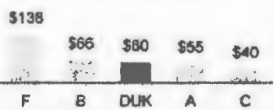
TOTAL ASSETS (\$B)⁽²⁾



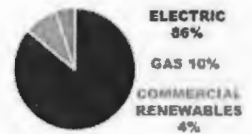
NORTH AMERICAN ELECTRIC CUSTOMERS (MM)



MARKET CAP (\$B)⁽³⁾



\$56 B 5-YEAR CAPITAL PLAN



53 GWS TOTAL GENERATING CAPACITY



310 K ELECTRIC T&D MILES

33 K GAS PIPELINE MILES

29 K EMPLOYEES

(1) DUK excludes \$2B Atlantic Coast Pipeline investment

(2) Balance sheet data as of 6/30/2020

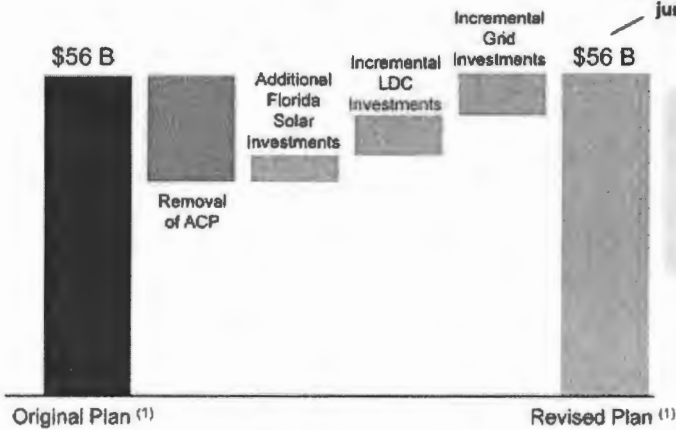
(3) As of August 25, 2020

Note: Peers listed as letters above include AEP, Berkshire Hathaway Energy, D, EXC, FE, NEE, PCG, and SO

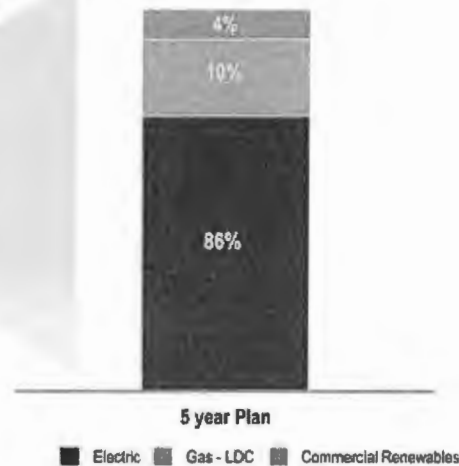
Earnings growth predicated on \$56 billion 5-year capital plan



\$56 BILLION, 5-YEAR CAPITAL PLAN REMAINS INTACT



2020-2024 CAPEX BREAKDOWN



Emerging infrastructure needs

- Piedmont LDC investments for the eastern part of NC replacing ACP need
- Grid upgrades and emerging infrastructure across all of our jurisdictions
- Additional solar investments from Florida's 750MW, Clean Energy Connection program
- Increasing focus on fleet transition including renewables and battery storage

(1) For illustrative purposes. Total amounts are not to scale.

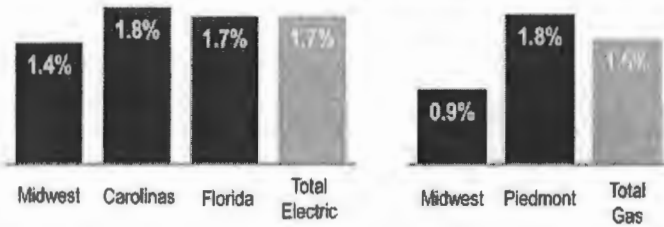
Continued strong organic customer growth underlies 5-year capital plan

- Low-risk, smaller scale projects
- Nearly 2% customer growth in the Southeast YTD Q2 2020

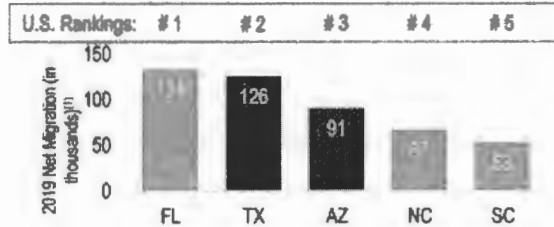
Strong customer growth in vibrant economies



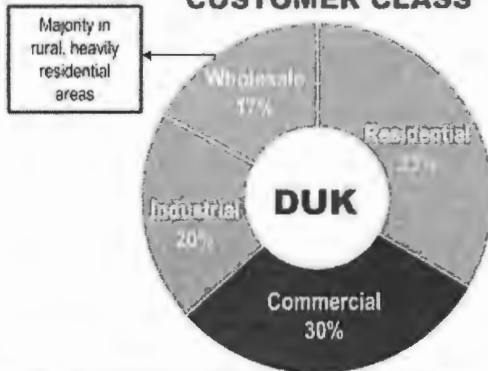
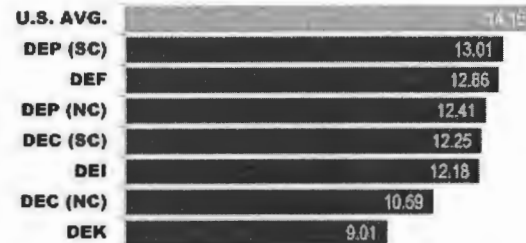
YTD Q2 2020 GROWTH IN NUMBER OF RESIDENTIAL CUSTOMERS



SERVING THREE OF THE MOST VIBRANT STATES IN THE COUNTRY



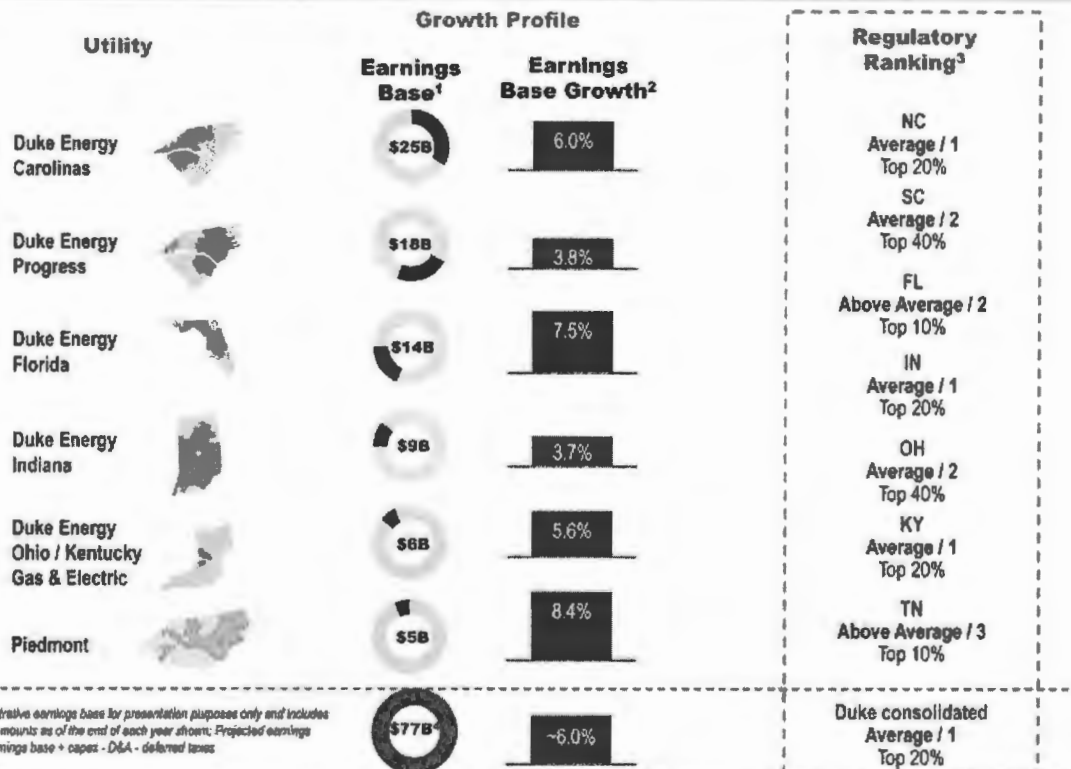
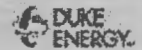
TOTAL ELECTRIC SALES BY CUSTOMER CLASS

COMPETITIVE CUSTOMER RATES⁽²⁾

(1) Source: Wells Fargo Securities; U.S. Department of Commerce

(2) Residential customer rates. Typical bill rates (\$/kWh) in effect as of July 1, 2019. Vertically integrated utilities only. Source: E&E Typical Bills and Avg. Rates Report, Winter 2019

And supportive regulatory relationships



(1) 2019A, in billions. Illustrative earnings base for presentation purposes only and includes retail and wholesale. Amounts as of the end of each year shown. Projected earnings base = prior period earnings base + capex - D&A - deferred taxes

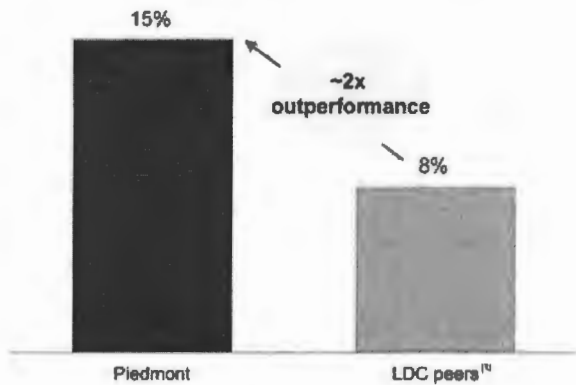
(2) 2019A-2024E CAGR

(3) State regulatory rankings reflect the average assessment across 53 regulatory jurisdictions published independently by RRA and S&P Global Ratings. RRA ranks jurisdictions as Above Average, Average and Below Average, with a sub-ranking of 1-3 for each status. Duke's weighted average rating of Average / 1 reflects the highest average rating prior to Above Average.

(4) Excludes \$2B Atlantic Coast Pipeline investment

INDUSTRY LEADING LDC BUSINESS

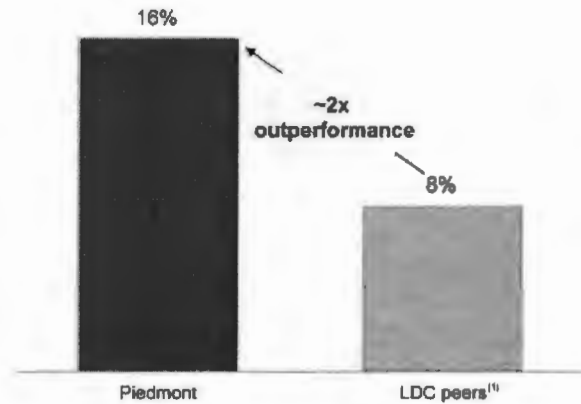
EARNINGS BASE GROWTH (\$B)



2016A-2020E Rate Base CAGR (\$mm)

Nearly doubled earnings base growth vs. U.S. pure-play listed LDCs

NET INCOME GROWTH (\$MM)



2015A-2020E Net Income CAGR (\$mm)

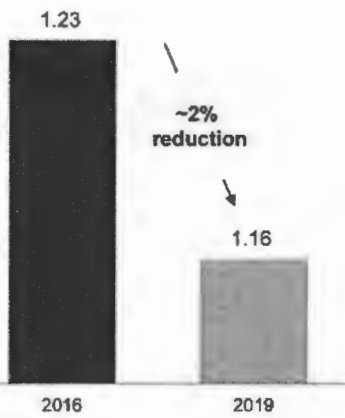
Doubled net income growth vs U.S. pure-play listed LDCs

(1) Peers include ATD, NWN, OGS, and SR

Piedmont's Customers Have Benefitted Under Duke Ownership



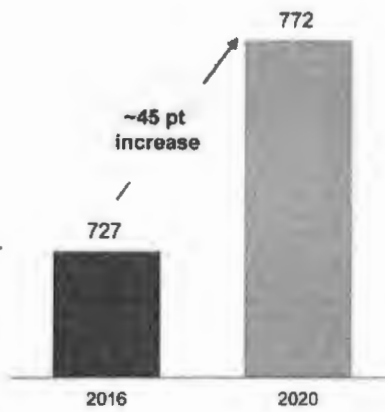
LOW CUSTOMER BILLS (\$/therm)



Average Customer Bill

Lower rates in all three
Piedmont jurisdictions

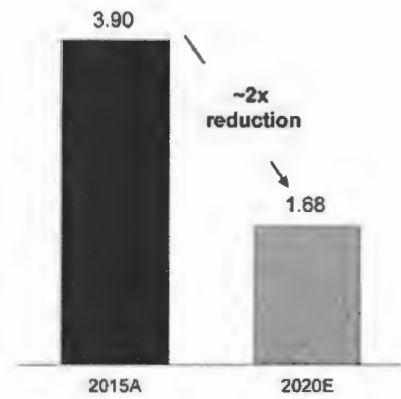
HIGH CUSTOMER SATISFACTION



Customer Satisfaction Metric

Significant improvement in
customer satisfaction metrics

STRONG SAFETY RECORD



TICR Safety Metrics

Greater than 2x reduction in
Total Incident Case Rate (TICR)

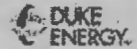


Track Record of Operational Performance



SEPTEMBER INVESTOR UPDATE 2020

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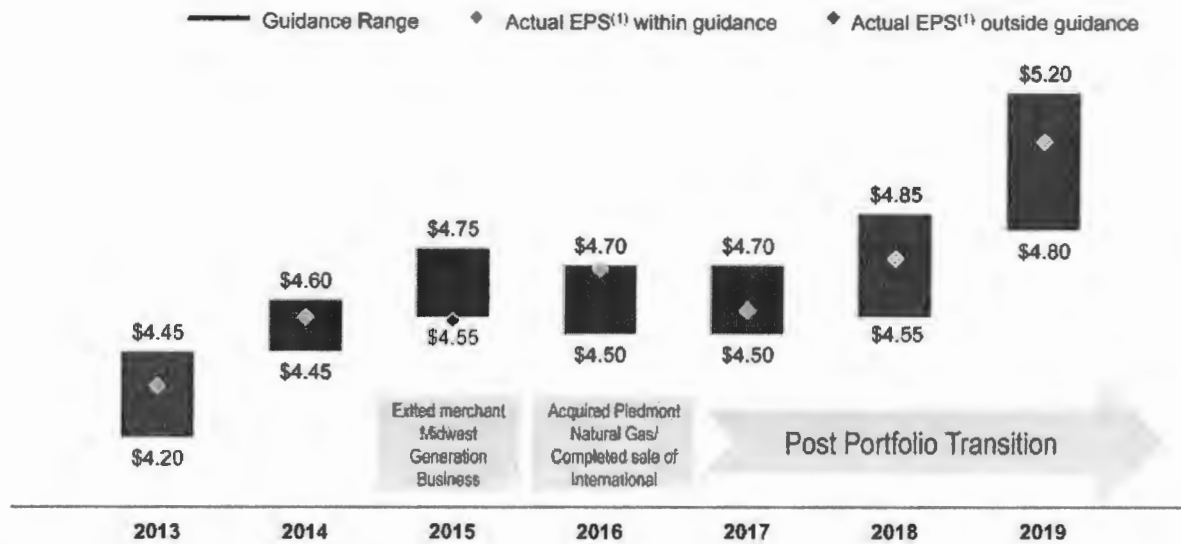
Strong Track Record of Performance

- ✓ Met annual guidance in 7 of the last 8 years while exiting businesses with volatile earnings
- ✓ Kept O&M flat, including absorbing ~\$300 million of O&M from the Piedmont acquisition in 2016, in addition to offsetting wage / salary increases and general inflation
- ✓ Earned at or above allowed ROE's on a consistent basis
- ✓ Consistently maintained customer bills below national average across all jurisdictions
- ✓ Achieved all-time high in customer satisfaction measures in 2Q20, reinforcing the effectiveness of our customer and community outreach
- ✓ Remained one of the electric utility industry's top leaders in safety performance for fifth year in a row

Strong Track Record of Meeting EPS Guidance



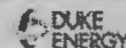
ADJUSTED EARNINGS PER SHARE VS. GUIDANCE



Met annual guidance in 7 of the last 8 years, with our sole miss coming in 2015 by \$0.01/sh

(1) Based on Adjusted EPS

We Have Succeeded On Major Project Development / Management



OUTSTANDING PROJECT MANAGEMENT ON KEY PROJECTS...

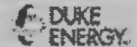
- ✓ **Citrus County Combined Cycle (CC) – 1,640 MW**
 - \$1.5 billion investment recovered through GBRA mechanism in FL
- ✓ **Lee CC – 750 MW**
 - \$700mm investment
 - Required additional Piedmont infrastructure
- ✓ **Asheville CC – 570 MW**
 - Part of \$1.4 B Western Carolinas Modernization Plan to retire coal early and increase renewables
- ✓ **Edwardsport IGCC – 618 MW**
 - Completed this advanced technology project when others could not
 - Cost recovery moved to base rates as requested/ approved in most recent rate case
- ✓ **Other significant generation adds to replace coal**
 - Total of 8 GW generation added since 2010

...AND PRUDENT DECISIONS TO NO LONGER PURSUE PROJECTS WHEN POTENTIAL RISKS EXCEED REWARDS

- ✓ **Levy and Lee new nuclear**
 - Had received approval, but post-Toshiba and Westinghouse bankruptcy saw too much risk
 - Shifted investment to augmenting natural gas and solar generation
- ✓ **Crystal River Nuclear Plant (CR3)**
 - Stopped investment and recovered legacy Progress investment via securitization
- ✓ **Atlantic Coast Pipeline**
 - Permitting delays and legal challenges created unacceptable cost uncertainty

Prudent decision making and efficient execution

With 2020 Additional O&M Cost Savings Well Underway



- Highly confident in achieving a \$350-\$450 million reduction in O&M and other expenses to mitigate 2020 headwinds
 - Unparalleled capability to mitigate headwinds given our size, scale and agility
- Clear line-of-sight of savings initiatives to achieve targets
 - Revised scope and timing of generation outages
 - Contract and employee labor costs, including overtime and variable compensation
 - Employee expenses reductions
 - Lower corporate costs such as IT expenditures
 - Lower interest expense due to well-timed capital market transactions
- Achieved \$170 million in savings through 2Q, with ability to deliver near the high end of mitigation range
 - Rapid response ability is a core competency
 - Business transformation team is developing solutions to make many of these initiatives sustainable for 2021 and beyond

\$ in millions

\$450
\$400
\$350
\$300
\$250
\$200
\$150
\$100
\$50
\$0



Targeted Savings

Achieved to Date ⁽¹⁾

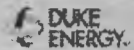
(1) Remaining cost mitigation efforts are expected to be more heavily weighted to the 4th quarter than the 3rd quarter.

**DEMONSTRATED TRACK RECORD OF CONSISTENTLY DELIVERING O&M
AND OTHER COST SAVINGS IN AN AGILE FASHION SINCE 2015**

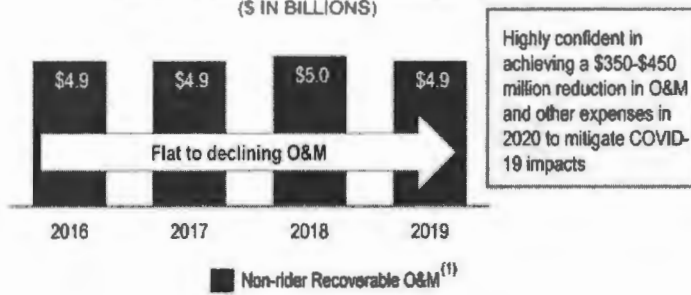
SEPTEMBER INVESTOR UPDATE 2020

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Strong O&M Cost Management



O&M COST MANAGEMENT (\$ IN BILLIONS)



TOP QUARTILE O&M PROFILE (Non-Generation O&M \$/Customer⁽²⁾)



TOP TIER COST MANAGEMENT CONTINUES

- Outstanding track record of cost management
- Since 2015, we have kept non-recoverable O&M flat
 - Includes absorbing ~\$300 million of O&M from the Piedmont acquisition in 2016, in addition to offsetting wage and salary increases and general inflation
- Leveraging increased cost flexibility to keep non-rider recoverable O&M flat despite inflation
- Employing data analytics and digital capabilities to enhance decision making and prioritization
- State of the art Innovation Center – Optimist Hall
- Utilizing cost saving opportunities as a lever to meet business commitments
- Applying our size and scale to transform operational capabilities

(1) Non-rider Recoverable O&M excludes special items and other non-recoverable charges incurred. For a reconciliation to GAAP O&M see accompanying materials at www.duke-energy.com/investors

(2) S&P Global Market Intelligence: SNL Energy Data as sourced from FERC Form 1. Data from over 128 U.S. Regulated Utilities with more than 100,000 customers, rounded.



Focus on Balance Sheet Management



SEPTEMBER INVESTOR UPDATE 2021

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Our utilities have strong credit metrics that support our corporate rating



Rated Issuers

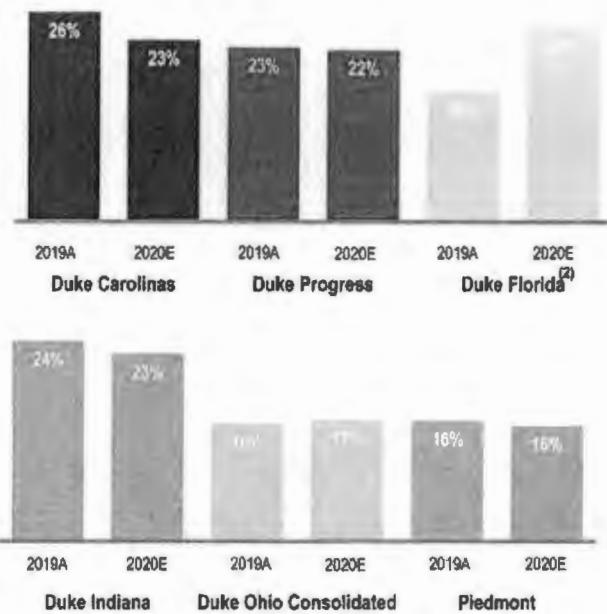
	Moody's	S&P
DUKE ENERGY CORPORATION	Stable	Stable
Senior Unsecured Debt	Baa1	BBB+
Commercial Paper	P-2	A-2
PROGRESS ENERGY, INC.	Stable	Stable
Senior Unsecured Debt	Baa1	BBB+
DUKE ENERGY CAROLINAS, LLC	Stable	Stable
Senior Secured Debt	Aa2	A
Senior Unsecured Debt	A1	A-
DUKE ENERGY PROGRESS, LLC	Stable	Stable
Senior Secured Debt	Aa3	A
DUKE ENERGY FLORIDA, LLC	Stable	Stable
Senior Secured Debt	A1	A
Senior Unsecured Debt	A3	A-
DUKE ENERGY INDIANA, LLC	Stable	Stable
Senior Secured Debt	Aa3	A
Senior Unsecured Debt	A2	A-
DUKE ENERGY OHIO, INC.	Stable	Stable
Senior Secured Debt	A2	A
Senior Unsecured Debt	Baa1	A-
DUKE ENERGY KENTUCKY, INC.	Stable	Stable
Senior Unsecured Debt	Baa1	A-
PIEDMONT NATURAL GAS, INC.	Stable	Stable
Senior Unsecured Debt	A3	A-

Note: Fitch announced on January 21, 2020 its intention to withdraw ratings on Duke Energy Corp within 30 days due to commercial reasons

(1) Key adjustments within the computation include the removal of coal ash remediation spending from FFO, and the adjusted debt balance excludes purchase accounting adjustments

(2) Assumes securitization treated as off credit

FFO/Debt⁽¹⁾



Strong focus on balance sheet and consistent dividend growth

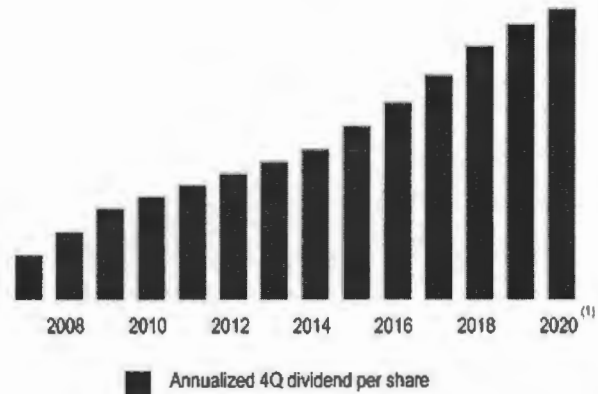


PRUDENT BALANCE SHEET MANAGEMENT

- Strong available liquidity position of \$8.7 billion as of Jun. 30
- Stable outlooks at Moody's and S&P
- Expect to receive remaining refundable AMT credits of ~\$575 million in 2020
 - AMT credits and O&M reductions support consolidated FFO/Debt of ~15% in 2020
- Equity forward of \$2.5 billion priced in Nov. 2019 expected to be settled by year-end 2020
 - Executed transaction opportunistically based on favorable market conditions and prior to COVID-related market sell-off
 - Transaction was sized to address a variety of scenarios including cancellation of ACP
- Continued annual equity issuances in our plan of \$500 million per year through 2022 via DRIP/ATM programs
- Pension plan is fully funded as of Jul. 2020

(1) 2% increase to quarterly dividend declared by the board of directors on July 7, 2020.
 (2) Based on adjusted EPS

INCREASED QUARTERLY DIVIDEND PAYMENT FOR THE 14TH CONSECUTIVE YEAR



65% - 75%
 LONG-TERM TARGET DIVIDEND
 PAYOUT RATIO⁽²⁾



Appendix



SEPTEMBER INVESTOR UPDATE 2011

7/11

ESG is an essential component of Duke Energy's strategy



ENVIRONMENTAL



- Industry-leading climate goal of net-zero carbon emissions by 2050
- Announced over 1,500 MW of new wind and solar projects in 2019
- Further reduced CO₂ emissions by an additional 8% in 2019 from 2005 levels, bringing total decrease to 39%
- Named to Dow Jones Sustainability North America Index for 14 years in a row
- Clear leader in energy efficiency savings in Southeast

SOCIAL RESPONSIBILITY



- One of the industry leaders for 5th year in a row in safety
- Named one of "America's Best Employers" by Forbes in 2019 and one of Fortune's "Worlds Most Admired Companies" for 3rd consecutive year
- Earned perfect score for third year in a row on the Human Rights Campaign Corporate Equality Index; also awarded "Best Places to Work for LGBTQ Equality"

GOVERNANCE & TRANSPARENCY



- Bloomberg ESG disclosure score of 57.4, the third best score and in the top quartile of U.S. utilities
- Climate report utilizes TCFD⁽¹⁾ framework; our pathway is consistent with 2-degree scenario
- 2019 board refreshment enhanced diversity (40% racial, gender and ethnic diversity)
- Strong ESG ratings from ISS Quality Score in 2019

Join us for our Inaugural ESG Analyst Day via live webcast on Oct. 9, 2020

(1) TCFD – Task Force on Climate-related Financial Disclosures

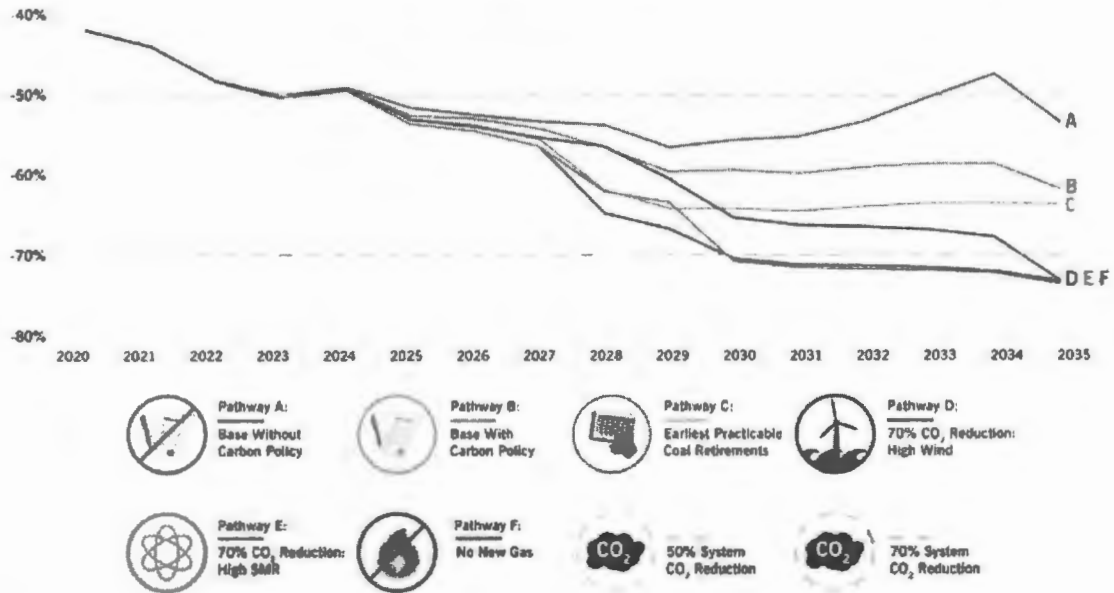
- Studies supporting resource methodology
 - Natural gas enables the acceleration of coal retirements by providing replacement winter peak resources as the integration of renewable resources and battery technology continues to advance
 - Berkeley Earth: "This research suggests that using natural gas as a bridge fuel away from coal is viable if we cannot immediately transition to near-zero carbon technologies. Coal is responsible for the bulk of U.S. CO₂ emissions from electricity generation, and gas provides a practical way to reduce such emissions, even when we include the effects of fugitive methane."
 - Kenan Institute at UNC: "The path to electricity de-carbonization via solely replacing fossil fuels with wind/solar will be much more expensive than widely perceived and point to the need for alternative and/or hybrid solutions, which may include combining wind/solar with natural gas, nuclear, carbon capture/sequestration and some level of carbon taxes"
 - Joule: "The role of firm low-carbon electricity resources in deep decarbonization of power generation" concludes the least-cost strategy to decarbonize electricity includes one or more firm low-carbon resources (including nuclear and natural gas). Without these resources, electricity costs rise rapidly as CO₂ limits approach zero.
 - Balancing renewable generation and use of battery storage
 - NREL (National Renewable Energy Laboratory):
 - Carbon Free Resource Integration Study evaluated the planning and operational considerations of integrating increasing levels of carbon-free resources onto the Duke Energy Carolinas and Duke Energy Progress systems
 - Grid-scale battery storage provides technical expertise related to the discharge capabilities of batteries
- 3rd party modeling assumptions
 - Nexant: Energy efficiency and Market potential study
 - Astrape Consulting: Reserve margin study
 - Tierra Resource Consultants, Proctor Engineering Group and Dunskey: Winter specific demand response and rate design benchmarking study
 - Pricing inputs provided by: Navigant, Energy Information Administration (EIA) Annual Energy Outlook, Guidehouse

- The 2020 IRP includes a most economic or "least-cost" portfolio, as required by North Carolina Utilities Commission (NCUC) Rule R8-60 and subsequent orders, and the Public Service Commission of South Carolina (PSCSC) and The Energy Freedom Act (Act 62), as well as multiple portfolios reflecting a range of potential future resource portfolios
- North Carolina requirements
 - 2 base cases: least cost resources (with and without price on carbon). Additional carbon and coal retirement analyses required for 2020 IRPs
 - NCUC will not "approve" the IRPs; rather, after a formal docket review with intervenors, the NCUC will "accept" the IRPs as reasonable for planning purposes (or reject some aspects of the IRP or make recommendations for future IRPs)
 - New generation resources will need to go through specific CPCN approval processes prior to construction and must demonstrate consistency with the most recent IRP
- South Carolina requirements
 - First IRP filed under Act 62; which contemplates several resource portfolios developed with the purpose of fairly evaluating the range of demand-side, supply-side, storage, and other technologies and services available to meet the utility's service obligations; PSCSC will approve or deny or modify; testimony and adversarial evidentiary hearings anticipated
 - Regulatory condition requires utility to utilize least cost planning
 - New resources will go through new Act 62 processes and statutory requirements for cost recovery, which do note a competitive procurement process.

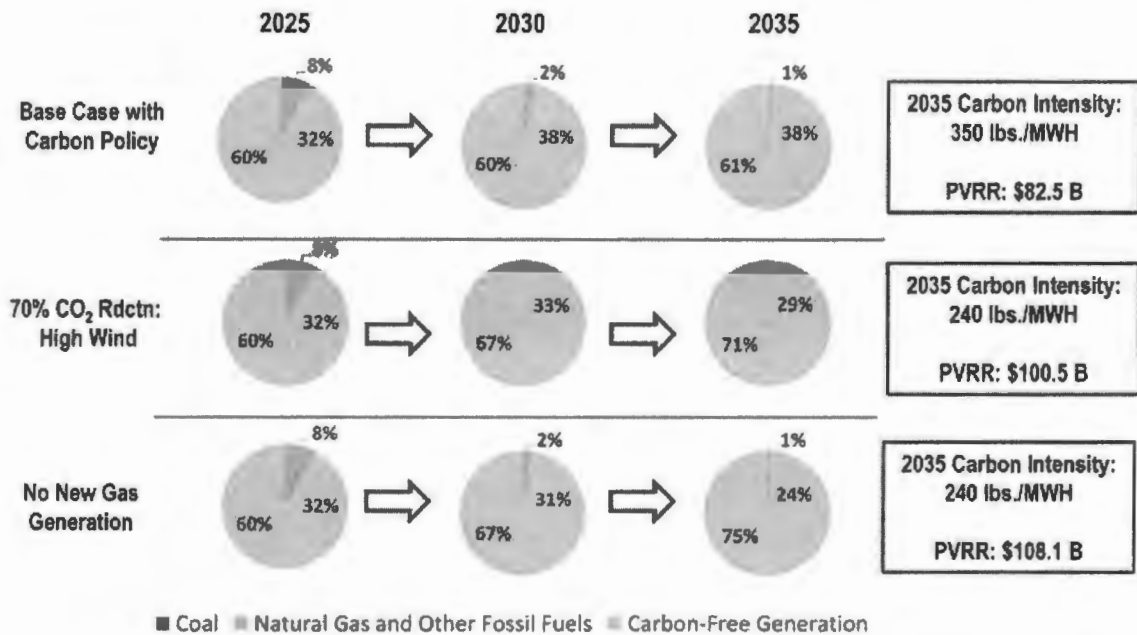
Carolinas IRPs: Carbon Reduction by Scenario



CARBON REDUCTION BY SCENARIO



Carolinas IRPs: Generation Mix by Portfolio



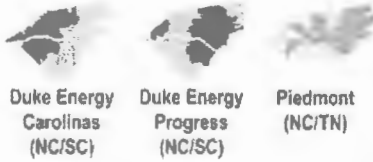
SIGNIFICANT CARBON REDUCTIONS ACHIEVED IN ALL SCENARIOS

We operate utilities across a diverse set of regions across the country



UTILITIES IN HIGH-QUALITY REGIONS OF THE U.S.

CAROLINAS



FLORIDA



MIDWEST



COMPETITIVE CUSTOMER RATES⁽¹⁾

RESIDENTIAL

U.S. AVG.	14.16
DEF (SC)	13.01
DEF	12.86
DEF (NC)	12.41
DEC (SC)	12.25
DEI	12.18
DEC (NC)	10.59
DEK	9.01

COMMERCIAL

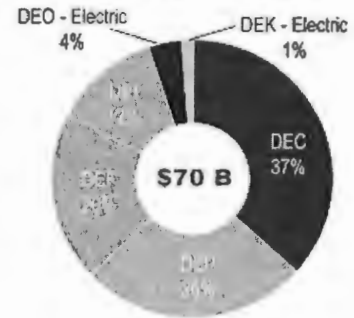
U.S. AVG.	11.52
DEC (SC)	10.77
DEF	10.40
DEI	10.13
DEK	9.38
DEC (NC)	9.28
DEF (SC)	9.22
DEF (NC)	9.09

INDUSTRIAL

U.S. AVG.	10.15
DEF	9.56
DEI	9.01
DEK	8.71
DEC (SC)	8.53
DEC (NC)	8.45
DEF (NC)	8.29
DEF (SC)	8.14

(1) Typical bill rates (¢/kWh) in effect as of July 1, 2019. Vertically integrated electric utilities only. Source: EEI Typical Bills and Avg. Rates Report, Winter 2019

REGULATED ELECTRIC 2019 EARNINGS BASE



BALANCED CUSTOMER MIX



Peer utility benchmarking



Ranked by net electric utility plant value (\$mm)

Key Metrics

	DUKE ENERGY	Peer A	Peer B	Peer C	Peer D	Peer E	Peer F	Peer G	Peer H	Peer I
Total electric sales (GWh)	206,584	147,734	134,866	196,403	122,489	117,172	89,441	49,988	51,286	36,077
Electric customers (000's)	7,800	4,270	5,500	9,100	5,470	3,500	3,700	3,800	3,110	1,628
Electric non-generation O&M / MWh	\$15	\$14	\$39	\$55	\$10	\$46	\$29	\$99	\$113	\$28
Electric non-generation O&M / Customer	\$382	\$493	\$594	\$430	\$225	\$482	\$549	\$602	\$692	\$619
Dist. miles / 1000 customers	36	42	7	16	14	24	56	36	19	43
Distribution line miles	280,100	179,000	40,000	149,945	75,751	85,000	207,524	134,903	58,332	70,600

Clear top-tier performance in O&M cost management

Sources: SNL FERC Form 1, annual filings and investor presentations; data as of YE 2019 unless otherwise noted

Advancing our strategic vision



TRANSFORM THE
CUSTOMER EXPERIENCE



MODERNIZE THE
ENERGY GRID



GENERATE
CLEANER ENERGY



EXPAND **NATURAL GAS**
INFRASTRUCTURE



STAKEHOLDER
ENGAGEMENT

**EMPLOYEE ENGAGEMENT AND OPERATIONAL EXCELLENCE
ARE FOUNDATIONAL TO OUR SUCCESS**

Our investor value proposition



DUK
LISTED
NYSE

A STRONG LONG-TERM RETURN PROPOSITION

DUK
LISTED
NYSE



**CONSTRUCTIVE JURISDICTIONS, LOW-RISK REGULATED
INVESTMENTS AND BALANCE SHEET STRENGTH**

(1) As of Aug. 6, 2020

(2) Subject to approval by the Board of Directors.

(3) Total shareholder return proposition at a constant P/E ratio

(4) Based on adjusted EPS

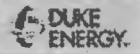


Upcoming events & other



SEPTEMBER 11/ESTOP UPDATE 2020

9/11

Upcoming events

Event	Date
2020 ESG Investor day	October 9, 2020
3Q 2020 earnings call	Early November 2020

BRYAN BUCKLER, VICE PRESIDENT INVESTOR RELATIONS

- Bryan.Buckler@duke-energy.com
- (704) 382-2640

CINDY LEE, DIRECTOR INVESTOR RELATIONS

- Cynthia.Lee@duke-energy.com
- (980) 373-4077

ABBY MOTSINGER, MANAGER INVESTOR RELATIONS

- Abby.Motsinger@duke-energy.com
- (704) 382-7624



For additional information on Duke Energy,
please visit: duke-energy.com/investors

Duke Energy Corporation
 Non-GAAP Reconciliations
 Duke Energy Investor Update
 September 2020

Adjusted Earnings per Share (EPS)

The materials for Duke Energy Corporation's (Duke Energy's) Investor Update in September 2020 include a discussion of adjusted EPS for the year-to-date periods ended December 31, 2019, 2018, 2017, 2016, 2015, 2014 and 2013.

The non-GAAP financial measure, adjusted EPS, represents basic EPS available to Duke Energy Corporation common stockholders (GAAP reported EPS), adjusted for the per share impact of special items. Special items represent certain charges and credits which management believes are not indicative of Duke Energy's ongoing performance.

Management believes the presentation of adjusted EPS provides useful information to investors, as it provides them with an additional relevant comparison of Duke Energy's performance across periods. Management uses this non-GAAP financial measure for planning and forecasting and for reporting financial results to the Duke Energy Board of Directors, employees, stockholders, analysts and investors. Adjusted EPS is also used as a basis for employee incentive bonuses. The most directly comparable GAAP measure for adjusted EPS is reported basic EPS available to Duke Energy Corporation common stockholders. Reconciliations of adjusted EPS for the year-to-date periods ended December 31, 2019, 2018, 2017, 2016, 2015, 2014 and 2013, to the most directly comparable GAAP measures are included here-in.

Adjusted EPS Guidance

The materials for Duke Energy's Investor Update in September 2020 include a reference to the forecasted 2019, 2018, 2017, 2016, 2015, 2014 and 2013, adjusted EPS guidance range per share. The materials also reference the long-term range of annual growth of 4% - 6%. The forecasted adjusted EPS is a non-GAAP financial measure as it represents basic EPS available to Duke Energy Corporation common stockholders (GAAP reported EPS), adjusted for the per share impact of special items, as discussed above under Adjusted EPS. Due to the forward-looking nature of this non-GAAP financial measure for future periods, information to reconcile it to the most directly comparable GAAP financial measure is not available at this time, as management is unable to project all special items for future periods, such as legal settlements, the impact of regulatory orders or asset impairments.

Available Liquidity

The materials for Duke Energy's Investor Update in September 2020 include a discussion of Duke Energy's available liquidity balance. The available liquidity balance presented is a non-GAAP financial measure as it represents cash and cash equivalents, excluding certain amounts held in foreign jurisdictions and cash otherwise unavailable for operations, the remaining availability under Duke Energy's available credit facilities, including the master credit facility and available equity forwards. The most directly comparable GAAP financial measure for available liquidity is cash and cash equivalents. A reconciliation of available liquidity as of June 30, 2020, to the most directly comparable GAAP measure is included here-in.

Non-Rider Recoverable O&M

The materials for Duke Energy's Investor Update in September 2020, include a discussion of Duke Energy's non-rider recoverable operating, maintenance and other expenses (O&M) for the year-to-date periods ended December 31, 2019, 2018, 2017 and 2016. Non-rider recoverable O&M expenses are non-GAAP financial measures, as they represent reported O&M expenses adjusted for special items and expenses recovered through riders. The most directly comparable GAAP financial measure for non-rider recoverable O&M expenses is reported operating, maintenance and other expenses. A reconciliation of non-rider recoverable O&M expenses for the year-to-date periods ended December 31, 2019, 2018, 2017, and 2016 to the most directly comparable GAAP measure are included here-in.

Dividend Payout Ratio

The materials for Duke Energy's Investor Update in September 2020, include a discussion of Duke Energy's forecasted dividend payout ratio of 65% - 75% based upon adjusted EPS. This payout ratio is a non-GAAP financial measure as it is based upon forecasted basic EPS available to Duke Energy Corporation common stockholders (GAAP reported EPS), adjusted for the per-share impact of special items, as discussed above under Adjusted EPS. The most directly comparable GAAP measure for adjusted EPS is reported basic EPS available to Duke Energy Corporation common stockholders. Due to the forward-looking nature of this non-GAAP financial measure for future periods, information to reconcile it to the most directly comparable GAAP financial measure is not available at this time, as management is unable to project all special items, as discussed above under Adjusted EPS Guidance.

Funds From Operations ("FFO") Ratios

The materials for Duke Energy's Investor Update in September 2020, include a reference to historical and expected FFO to Total Debt ratios. These ratios reflect non-GAAP financial measures. The numerator of the FFO to Total Debt ratio is calculated principally by using net cash provided by operating activities on a GAAP basis, adjusted for changes in working capital, ARO spend, depreciation and amortization of operating leases and reduced for capitalized interest (including any AFUDC interest). The denominator for the FFO to Total Debt ratio is calculated principally by using the balance of long-term debt (excluding purchase accounting adjustments and long-term debt associated with the CR3 Securitizations) including current maturities, imputed operating lease liabilities, plus notes payable, commercial paper outstanding, underfunded pension liability, guarantees on joint-venture debt, and adjustments to hybrid debt and preferred stock issuances based on how credit rating agencies view the instruments. The calculation of FFO to Total Debt ratio for the year ended December 31, 2019 is included here-in. Due to the forward-looking nature of this non-GAAP financial measure for future periods, information to reconcile it to the most directly comparable GAAP financial measure is not available at this time, as management is unable to project all special items, as discussed above under Adjusted EPS Guidance.

Business Mix Percentage

The materials for Duke Energy's Investor Update in September 2020, reference ninety-five percent of earnings coming from the regulated electric and gas utilities as a percentage of the total projected 2020 adjusted net income (i.e. business mix), excluding the impact of Other. Duke Energy's regulated electric and gas utilities are included in the Electric Utilities and Infrastructure and Gas Utilities and Infrastructure segments, respectively.

Adjusted segment income is a non-GAAP financial measure, as it represents reported segment income adjusted for special items. Due to the forward-looking nature of any forecasted adjusted segment income information to reconcile this non-GAAP financial measure to the most directly comparable GAAP financial measure is not available at this time, as management is unable to project all special items (as discussed above under Adjusted EPS Guidance).

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
Year Ended December 31, 2019
(Dollars in millions, except per-share amounts)

	<u>Special Items</u>				
	<u>Reported Earnings</u>	<u>Impairment Charge</u>	<u>Discontinued Operations</u>	<u>Total Adjustments</u>	<u>Adjusted Earnings</u>
SEGMENT INCOME					
Electric Utilities and Infrastructure	\$ 3,534	\$ (27) ^A	\$ —	\$ (27)	\$ 3,509
Gas Utilities and Infrastructure	452	19 ^B	—	19	451
Commercial Renewables	198	—	—	—	198
Total Reportable Segment Income	4,185	(8)	—	(8)	4,185
Other	(452)	—	—	—	(452)
Discontinued Operations	(7)	—	7 ^C	7	—
Net Income Available to Duke Energy Corporation Common Stockholders	\$ 3,707	\$ (8)	\$ 7	\$ (1)	\$ 3,706
EPS AVAILABLE TO DUKE ENERGY CORPORATION COMMON STOCKHOLDERS, BASIC	\$ 5.06	\$ (0.01)	\$ 0.01	\$ —	\$ 5.06

Note: Earnings Per Share amounts are adjusted for accumulated but not yet declared dividends for Series B Preferred Stock of \$(0.02).

A — Net of \$9 million tax expense. \$36 million reduction of a prior year impairment recorded within impairment charges for the Citrus County CC project on Duke Energy Florida's Consolidated Statements of Operations.

B — Net of \$6 million tax benefit. \$25 million included within Other Income and Expenses on the Consolidated Statements of Operations, related to the other-than-temporary-impairment of the remaining investment in Constitution Pipeline Company, LLC.

C — Recorded in (Loss) Income from Discontinued Operations, net of tax on the Consolidated Statements of Operations.

Weighted Average Shares, Diluted (reported and adjusted) — 729 million

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2018
 (Dollars in millions, except per-share amounts)

	Reported Earnings	Special Items							Total Adjustments	Adjusted Earnings
		Costs to Achieve Prudent Budget	Regulatory and Legislative Impacts	Sale of Retired Plant	Impairment Charges	Impacts of the Tax Act	Severance	Discontinued Operations		
SEGMENT INCOME										
Electric Utilities and Infrastructure	\$ 3,058	\$ —	\$ 202 B	\$ —	\$ 46 D	\$ 24	\$ —	\$ —	\$ 272	\$ 3,330
Gas Utilities and Infrastructure	274	—	—	—	42 E	1	—	—	43	317
Commercial Renewables	9	—	—	—	91 F	(3)	—	—	88	97
Total Reportable Segment Income	3,341	—	202	—	179	22	—	—	403	3,744
Other	(694)	65 A	—	82 C	—	(2)	144 H	—	289	(406)
Discontinued Operations	19	—	—	—	—	—	—	(19) I	(19)	—
Net Income Attributable to Duke Energy Corporation	\$ 2,666	\$ 65	\$ 202	\$ 82	\$ 179	\$ 20 G	\$ 144	\$ (19)	\$ 673	\$ 3,339
EPS ATTRIBUTABLE TO DUKE ENERGY CORP. BASIC	\$ 3.78	\$ 0.88	\$ 0.29	\$ 0.12	\$ 0.25	\$ 0.03	\$ 0.21	\$ (0.03)	\$ 0.96	\$ 4.72

A - Net of \$19 million tax benefit. \$34 million recorded within Operating Expenses on the Consolidated Statements of Operations.

B - Net of \$16 million tax benefit at Duke Energy Progress and \$47 million tax benefit at Duke Energy Carolinas.

• On the Duke Energy Progress Consolidated Statement of Operations, \$32 million is recorded within impairment charges, \$31 million within Operations, maintenance and other, \$6 million within Interest Expense and \$1 million within Depreciation and amortization.

• On the Duke Energy Carolinas Consolidated Statement of Operations, \$166 million is recorded within impairment charges, \$8 million within Operations, maintenance and other, and \$1 million within Depreciation and amortization.

C - Net of \$25 million tax benefit. \$107 million recorded within Gains (Losses) on Sales of Other Assets and Other, net on the Consolidated Statement of Operations.

D - Net of \$14 million tax benefit. \$80 million recorded within impairment charges on the Consolidated Statements of Operations.

E - Net of \$13 million tax benefit. \$56 million included within Other Income and Expenses on the Consolidated Statement of Operations.

F - Net of \$2 million Noncontrolling Interests. \$93 million goodwill impairment recorded within impairment charges on the Consolidated Statements of Operations.

G - \$20 million true up of prior year Tax Act estimates recorded within Income Tax Expense from Continuing Operations on the Consolidated Statements of Operations.

H - Net of \$43 million tax benefit. \$187 million recorded within Operations, maintenance and other on the Consolidated Statements of Operations.

I - Recorded in Income (Loss) from Discontinued Operations, net of tax on the Consolidated Statements of Operations.

Weighted Average Shares, Diluted (reported and adjusted) - 708 million

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2017
 (Dollars in millions, except per-share amounts)

	Reported Earnings	Special Items					Discontinued Operations	Total Adjustments	Adjusted Earnings
		Costs to Achieve Fuel Cost Savings	Regulatory Settlements	Commercial Renewable Impairments	Impacts of the Tax Act				
SEGMENT INCOME									
Electric Utilities and Infrastructure	\$ 3,210	\$ —	\$ 98 B	\$ —	\$ (231)	\$ —	\$ (133)	\$ 3,077	
Gas Utilities and Infrastructure	319	—	—	—	(38) D	—	(38)	281	
Commercial Renewables	608	—	—	74 C	(442)	—	(368)	240	
Total Reportable Segment Income	3,897	—	98	74	(669)	—	(527)	3,443	
Other	(905)	64 A	—	—	587	—	641	(244)	
Discontinued Operations	(8)	—	—	—	—	6 E	6	—	
Net Income Attributable to Duke Energy Corporation	\$ 3,058	\$ 64	\$ 98	\$ 74	\$ (102) D	\$ 6	\$ 148	\$ 3,199	
EPS ATTRIBUTABLE TO DUKE ENERGY CORP. BASIC	\$ 4.36	\$ 0.09	\$ 0.14	\$ 0.11	\$ (0.14)	\$ 0.01	\$ 0.21	\$ 4.57	

A - Net of \$38 million tax benefit. \$102 million recorded within Operating Expenses and \$1 million recorded within Interest Expense on the Consolidated Statements of Operations.

B - Net of \$80 million tax benefit. \$154 million recorded within Impairment charges and \$4 million recorded within Other Income and Expenses on the Consolidated Statements of Operations.

C - Net of \$20 million tax benefit. \$62 million recorded within Impairment charges and \$10 million recorded within Other Income and Expenses on the Consolidated Statements of Operations.

D - \$116 million benefit recorded with Income Tax Expense from Continuing Operations, offset by \$16 million expense recorded within Gas Utilities and Infrastructure's Equity in Earnings of Unconsolidated Affiliates on the Consolidated Statements of Operations.

E - Recorded in Income (Loss) from Discontinued Operations, net of tax on the Consolidated Statements of Operations.

Weighted Average Shares, Diluted (reported and adjusted) - 709 million

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2016
 (Dollars in millions, except per-share amounts)

	Special Items							Adjusted Earnings
	Reported Earnings	Costs to Achieve Synergies	Cost Savings Initiatives	Commercial Renewables Impairment	International Energy Operations	Discontinued Operations	Total Adjustments	
SEGMENT INCOME								
Electric Utilities and Infrastructure	\$ 3,040	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 3,040
Gas Utilities and Infrastructure	152	—	—	—	—	—	—	152
Commercial Renewables	23	—	—	45 C	—	—	45	68
Total Reportable Segment Income	3,215	—	—	45	—	—	45	3,260
International Energy	—	—	—	—	243 D	—	243	243
Other	(645)	320 A	57 B	—	—	—	386	(259)
Intercompany Eliminations	1	—	—	—	—	(1)	(1)	—
Discontinued Operations	(618)	—	—	—	(263) D	662 E	419	—
Net Income Attributable to Duke Energy Corporation	\$ 2,152	\$ 320	\$ 57	\$ 45	\$ —	\$ 661	\$ 1,083	\$ 3,244
EPS ATTRIBUTABLE TO DUKE ENERGY CORPORATION, BASIC	\$ 3.11	\$ 0.48	\$ 0.08	\$ 0.07	\$ —	\$ 0.95	\$ 1.96	\$ 4.90

A - Net of \$194 million tax benefit. Includes \$11 million recorded within Operating Revenues, \$278 million recorded within Operating Expenses and \$234 million recorded within Interest Expense on the Consolidated Statements of Operations. The interest expense primarily relates to losses on forward-starting interest rate swaps associated with the Piedmont acquisition financing.

B - Net of \$35 million tax benefit. Primarily consists of severance costs recorded within Operation, maintenance and other on the Consolidated Statements of Operations.

C - Net of \$26 million tax benefit. Other-than-temporary impairment included within Equity in earnings (losses) of unconsolidated affiliates on the Consolidated Statements of Operations.

D - Net of \$37 million tax expense. Operating results of the International Disposal Group, which exclude the loss and impairment described below and other miscellaneous transaction-related costs, recorded within (Loss) Income from Discontinued Operations, net of tax on the Consolidated Statements of Operations.

E - Recorded within (Loss) Income from Discontinued Operations, net of tax on the Consolidated Statements of Operations. Includes a loss on the sale of the International Disposal Group, an impairment charge related to certain assets in Central America, and a tax benefit related to previously sold businesses.

Weighted Average Shares, Diluted (reported and adjusted) - 691 million

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2015
 (Dollars in millions, except per-share amounts)

	Special Items										Total Adjustments	Adjusted Earnings
	Reported Earnings	Costs to Advance Bargains	Edwardport Settlement	Midwest Generation Operations	Ash-Booth Settlement and Penalties	Cost Savings Initiatives	International Energy Operations	Discontinued Operations				
SEGMENT INCOME												
Electric Utilities and Infrastructure	\$ 2,816	\$ —	\$ 10	\$ —	\$ 11	\$ 10	\$ —	\$ —	\$ 79	\$ 2,896		
Gas Utilities and Infrastructure	73	—	—	—	—	—	—	—	—	73		
Commercial Renewable	82	—	—	—	—	1	—	—	1	83		
Total Reportable Segment Income	2,945	—	55	—	11	11	—	—	80	3,094		
International Energy	—	—	—	—	—	—	754	—	131	131		
Other	(230)	80	—	96	—	77	—	41	278	(23)		
Discontinued Operations	171	—	—	(50)	—	—	(103)	28	(171)	—		
Net Income Attributable to Duke Energy Corporation	\$ 2,916	\$ 80	\$ 55	\$ —	\$ 11	\$ 88	\$ —	\$ 119	\$ 330	\$ 3,182		
EPS ATTRIBUTABLE TO DUKE ENERGY CORPORATION, Basic	\$ 4.06	\$ 0.00	\$ 0.00	\$ —	\$ 0.02	\$ 0.13	\$ —	\$ 0.17	\$ 0.40	\$ 4.64		

A - Net of \$77 million tax benefit. \$85 million recorded within Operating Expenses and \$2 million recorded within Interest Expense on the Consolidated Statements of Operations.

B - Net of \$36 million tax benefit. \$85 million recorded within Intergovernmental charges and \$4 million recorded within Other Income and Expenses, net on the Duke Energy Indiana Consolidated Statements of Operations.

C - Net of \$93 million tax expense. Operating results of the nonregulated Midwest generation business classified as discontinued operations, which exclude special items and economic hedges.

D - Net of \$3 million tax benefit. Recorded within Operation, maintenance and other on the Consolidated Statements of Operations. Includes \$8 million and \$6 million at Duke Energy Carolina and Duke Energy Progress, respectively.

E - Net of \$6 million tax benefit. Primarily consists of severance costs recorded within Operation, maintenance and other on the Consolidated Statements of Operations. Includes \$7 million at Duke Energy Carolina, \$4 million at Duke Energy Progress, \$2 million at Duke Energy Ohio and \$2 million at Duke Energy Indiana.

F - Net of \$1 million tax benefit. Primarily consists of severance costs recorded within Operation, maintenance and other on the Consolidated Statements of Operations.

G - Net of \$47 million tax benefit. Primarily consists of severance costs recorded within Operation, maintenance and other on the Consolidated Statements of Operations.

H - Net of \$70 million tax expense. Operating results of the International Energy Group classified as discontinued operations.

I - State tax expense resulting from the completion of the sale of the nonregulated Midwest generation business.

J - Recorded in Income (Loss) from Discontinued Operations, net of tax on the Consolidated Statements of Operations, and includes the impact of a litigation reserve related to the nonregulated Midwest generation business.

Weighted Average Shares Outstanding, Diluted (reported and adjusted) - 694 million

DUKE ENERGY CORPORATION
ADJUSTED TO REPORTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2014
 (Dollars in millions, except per-share amounts)

	Special Items									
	Reported Earnings	Costs to Achieve Progress Margin	Asset Impairment	Liabilities Reserve	Asset Sales	International Tax Adjustment	Economic Hedges (Warrant-to-Market)	Discontinued Operations	Total Adjustments	Adjusted Earnings
Net income (Loss) Attributable to Duke Energy Corporation	\$ 1,821	\$ 127	\$ 33	\$ 122	\$ 5	\$ 173	\$ 1	\$ 477	\$ 1,225	\$ 1,218
EPS ATTRIBUTABLE TO DUKE ENERGY CORPORATION, BASIC	\$ 2.96	\$ 0.19	\$ 0.05	\$ 0.14	\$ (0.01)	\$ 0.63	\$ 0.01	\$ 0.84	\$ 1.28	\$ 1.28

A - Net of \$15 million tax benefit. Recorded as a decrease in Operating Revenues. \$15 million recorded as an Operating Expense and \$1 million recorded as an Interest Expense on the Consolidated Statements of Operations.

B - Net of \$1 million tax benefit. Recorded as an Operating Revenue on the Consolidated Statements of Operations.

C - Net of \$15 million tax benefit. Recorded as impairment charges on the Consolidated Statements of Operations.

D - Recorded as an Operating Maintenance and Other Operating Expenses on the Consolidated Statements of Operations.

E - Net of \$1 million tax expense. Recorded in Other Income and Expenses on the Consolidated Statements of Operations.

F - Deferred tax impact resulting from the decision to reclassify International Energy's historic and projected foreign earnings, included as an Income Tax Expense on the Consolidated Statement of Operations.

G - Recorded in income (loss) from Discontinued Operations, net of tax on the Consolidated Statements of Operations, and was the impairment of the nonregulated Midwest generation business, the "mark-to-market" of economic hedges of the nonregulated Midwest generation business, state tax benefit resulting from the planned disposition and certain costs associated with a contract settlement.

Weighted Average Shares reported and adjusted - in millions

Basic	727
Diluted	727

"Mark-to-market" adjustments reflect the impact of derivative contracts, which are used in Duke Energy's hedging of a portion of the economic value of its commercial generation assets and also relate to existing derivative positions that may have reports beyond the planned disposal date of the nonregulated Midwest generation business. The mark-to-market impact of derivative contracts is recognized in GAAP earnings immediately as such derivative contracts do not qualify for hedge accounting or regulatory treatment. The economic value of generation assets is subject to fluctuations in fair value due to market price volatility of input and output commodities (e.g., coal, electricity, natural gas). Economic hedging involves both purchases and sales of these input and output commodities related to generation assets. Operations of the generation assets are accounted for under the accrual method. Management believes including impacts of mark-to-market changes of the derivative contracts from adjusted earnings (the settlement value matches the financial impact of the derivative contract with the portion of economic value of the underlying hedged asset). However, due to the structure of the nonregulated Midwest generation business as mentioned above, certain derivative positions have reports beyond the planned disposal date of these assets. As such, management has excluded settlements of these derivative positions from adjusted diluted EPS as these releases have and cause more closely relate to the loss in economic value of these assets. Management believes that the presentation of adjusted diluted EPS attributable to Duke Energy Corporation provides useful information to investors as it provides them an additional relevant comparison of Duke Energy Corporation's performance across periods.

DUKE ENERGY CORPORATION
ADJUSTED TO REPORTED EARNINGS RECONCILIATION
Twelve Months Ended December 31, 2013
(Dollars in millions, except per-share amounts)

	Reported Earnings	Special Items						Total Adjustments	Adjusted Earnings
		Costs to Achieve, Progress Merger	Nuclear Development Charges	Litigation Reserve	Crystal River Unit 3 Impairment	Asset Sales	Discontinued Operations		
Net Income (Loss) Attributable to Duke Energy Corporation	\$ 2,566	\$ 164 A	\$ 57 B	\$ 14 C	\$ 216 D	\$ (50) E	\$ (6) F	\$ 415	\$ 3,080
EPS ATTRIBUTABLE TO DUKE ENERGY CORPORATION, BASIC	\$ 3.77	\$ 0.26	\$ 0.08	\$ 0.02	\$ 0.31	\$ (0.07)	\$ (0.01)	\$ 0.59	\$ 4.36

A - Net of \$113 million tax benefit. \$57 million recorded as a decrease in Operating Revenues, \$350 million recorded within Operating Expenses and \$2 million recorded within Interest Expense on the Consolidated Statements of Operations.

B - Net of \$30 million tax benefit. Recorded within Impairment Charges (Operating Expenses) on the Consolidated Statements of Operations.

C - Net of \$8 million tax benefit. Recorded in Operations, maintenance, and other (Operating Expenses) on the Consolidated Statement of Operations.

D - Net of \$137 million tax benefit. \$2 millions recorded as a decrease in Operating Revenues and \$344 million recorded within Operating Expenses on the Consolidated Statement of Operations.

E - Net of \$21 million tax expense. Recorded in Other Income and Expenses on the Consolidated Statements of Operations and Gain/Loss on Sales of Other Assets on the Consolidated Statement of Operations.

F - Recorded in Income (Loss) From Discontinued Operations, net of tax, on the Consolidated Statements of Operations. Includes the impairment of the nonregulated Midwest generation business and the mark-to-market of economic hedges of the nonregulated Midwest generation business.

Weighted Average Shares (reported and adjusted) - in millions

Basic	706
Diluted	706

Duke Energy Corporation
Available Liquidity Reconciliation
As of June 30, 2020
(In millions)

Cash and Cash Equivalents	\$ 341
Less: Certain Amounts Held in Foreign Jurisdictions	(110)
Less: Unavailable Domestic Cash	(87)
	244
Plus: Remaining Availability under Master Credit Facilities and other facilities	5,892
Plus: Remaining Availability from Equity Forwards	2,579
Total Available Liquidity (a), June 30, 2020	\$ 8,715 approximately 8.7 billion

(a) The available liquidity balance presented is a non-GAAP financial measure as it represents Cash and cash equivalents, excluding certain amounts held in foreign jurisdictions and cash otherwise unavailable for operations, and remaining availability under Duke Energy's available credit facilities, including the master credit facility and available equity forwards as of June 30, 2020. The most directly comparable GAAP financial measure for available liquidity is Cash and cash equivalents.

Duke Energy Corporation
Operations, Maintenance and Other Expense
(In millions)

	Actual December 31, 2016	Actual December 31, 2017	Actual December 31, 2018	Actual December 31, 2019
Operation, maintenance and other ^(a)	\$6,223	\$5,944	\$6,463	\$6,066
Adjustments:				
Costs to Achieve Mergers ^(b)	(238)	(94)	(83)	—
Severance ^(c)	(92)	—	(167)	—
Regulatory settlement ^(c)	—	(5)	(40)	—
Reagents Recoverable ^(c)	(93)	(90)	(112)	(95)
Energy Efficiency Recoverable ^(c)	(417)	(485)	(446)	(415)
Other Deferrals and Recoverable ^(c)	(233)	(246)	(477)	(472)
Margin based O&M for Commercial Businesses	(185)	(94)	(113)	(95)
Short-term incentive payments (over/under budget)	(90)	(22)	(30)	(112)
Non-Rider Recoverable operation, maintenance and other	<u>\$ 4,875</u>	<u>\$ 4,908</u>	<u>\$ 4,974</u>	<u>\$ 4,878</u>

(a) As reported in the Consolidated Statements of Operations.

(b) Presented as a special item for the purpose of calculating adjusted earnings and adjusted diluted earnings.

(c) Primarily represents expenses to be deferred or recovered through rate riders.

FFO to Debt Calculation
Duke Energy Corporation
(in millions)

	Year Ended December 31,	
	2019	2018
Cash From Operations	\$ 8,309	\$ 8,309
Adjust for Working Capital	250	250
Cash ARO spend	746	746
Include Capitalized Interest on cost	(159)	(159)
Hybrid interest adjustment	30	30
Preferred stock adjustment	(21)	(21)
CRS securitization adjustment	(34)	(34)
ACP construction loan interest adjustment	(32)	(32)
AMT refund adjustment (1)	(287)	(287)
Less-imputed FFO adjustment (2)(3)	340	340
Funds From Operations	\$ 8,908	\$ 8,908
Notes payable and commercial paper	\$ 3,135	\$ 3,135
Current maturities of LT debt	3,141	3,141
LT debt	54,985	54,985
Less: Purchase Accounting adjustments	(1,912)	(1,912)
CRS securitization	(1,112)	(1,112)
Underfunded Pension	330	330
ACP construction loan	827	827
Hybrid debt adjustment	(250)	(250)
Preferred stock adjustment	1,000	1,000
Less-imputed debt	1,640	1,640
Total Balance Sheet Debt (including ST)	\$ 61,688	\$ 61,688
Working capital detail, including MTLA		
Receivables	\$ 78	\$ 78
Inventory	(132)	(132)
Other current assets	30	30
Accounts payable	(164)	(164)
Taxes accrued	(224)	(224)
Other current liabilities	178	178
	\$ (230)	\$ (230)
FFO / Debt	14.4%	14.4%

(1) AMT refund adjustment is an expected 2020 cash inflow from the IRS related to AMT refunds that Duke Energy will receive as a result of the 2017 Tax Act. The 2020 AMT refund is included in the 2019 GAAP cash flow statement as deferred income taxes and change in other current assets. The change in other current assets is part of working capital, which is added back to the cash from operations. Therefore, the AMT refund adjustment is required to reduce cash from operations so there is no impact in 2019 for the 2020 expected AMT Refund.

In the 2018 Funds From Operations, a similar adjustment should have been made for the \$573 million AMT refund. Had the adjustment been made, the Funds From Operations would have been reduced by \$573 million. Starting in 2019 and going forward, receipts of the AMT refund will consistently be included in Funds From Operations in the year the cash is received.



PFO to Debt Calculation
Duke Energy Progress
(in millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	1,829
Adjust for Working Capital		(92)
Coal ash ARO spend		390
Include Capitalized Interest as cost		(28)
Lease-imputed PFO adjustment (DBA)		56
Funds From Operations	\$	2,149
Notes payable to affiliated companies	\$	66
Current maturities of LT debt		1,006
LT debt		7,902
LT debt payable to affiliates		150
Lease imputed debt		391
Total Balance Sheet Debt (including ST)	\$	9,515
Working capital detail, excluding MTH		
Receivables	\$	21
Receivables from affiliates		(29)
Inventory		30
Other current assets		101
Accounts payable		92
Accounts payable to affiliates		(75)
Taxes accrued		(46)
Other current liabilities		68
	\$	62
PFO / Debt		22.6%

FFO to Debt Calculation
Duke Energy Florida
(In millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	1,470
Adjust for Working Capital		(178)
Coal ash ARO spend		22
Include Capitalized Interest as cost		(3)
Adjust for CR3		(54)
Lease-imputed FFO adjustment (D&A)		79
Proceeds From Operations	\$	1,346
Notes payable to affiliated companies	\$	-
Current maturities of LT debt		571
LT debt		7,416
Adjust for CR3		(1,111)
Lease imputed debt		401
Underfunded Pension		77
Total Balance Sheet Debt (including ST)	\$	7,364
Working capital detail, excluding MTM		
Receivables	\$	26
Receivables from affiliates		17
Inventory		42
Other current assets		156
Accounts payable		(36)
Accounts payable to affiliates		40
Taxes accrued		(31)
Other current liabilities		(26)
	\$	170
FFO / Debt		18.3%

FFO to Debt Calculation
Duke Energy Indiana
(In millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	997
Adjust for Working Capital		2
Coal ash ARO spend		48
Include Capitalized Interest as cost		(26)
Lease-imputed FFO adjustment (DLA)		18
Funds From Operations	\$	1,039
Notes payable to affiliated companies	\$	30
Current maturities of LT debt		503
LT debt		3,404
LT debt payable to affiliates		150
CRC		186
Lease imputed debt		58
Total Balance Sheet Debt (including ST)	\$	4,331
Working capital detail, excluding MTM		
Receivables	\$	(8)
Receivables from affiliates		41
Inventory		(95)
Other current assets		76
Accounts payable		(10)
Accounts payable to affiliates		4
Taxes accrued		(25)
Other current liabilities		15
	\$	(2)
FFO / Debt		24.0%

FFO to Debt Calculation
Duke Energy Ohio
(in millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	\$36
Adjust for Working Capital		(19)
Cost Ash ARO spend		8
Include capitalized interest as cost		(22)
Lease-imputed FFO adjustment (D&A)		10
Funds From Operations	\$	\$08
Notes payable to affiliated companies	\$	312
Current maturities of LT debt		-
LT debt		2,594
LT debt payable to affiliates		25
CRC		165
Lease imputed debt		22
Total Balance Sheet Debt (including ST)	\$	3,118
Working capital detail, excluding MTM		
Receivables	\$	20
Receivables from affiliates		22
Inventory		(9)
Other current assets		(5)
Accounts payable		(17)
Accounts payable to affiliates		(10)
Taxes accrued		17
Other current liabilities		1
	\$	26
FFO / Debt		16.1%

FFO to Debt Calculation
Piedmont Natural Gas
(In millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	409
Adjust for Working Capital		68
Include Capitalized Interest as cost		(26)
Lease-imputed FFO adjustment (D&A)		4
Funds From Operations	\$	475
Notes payable to affiliated companies	\$	475
Current maturities of LT debt		-
LT debt		2,384
Lease imputed debt		27
Total Balance Sheet Debt (including GT)	\$	2,887
Working capital detail, excluding MTM		
Receivables	\$	28
Receivables from affiliates		12
Inventory		(2)
Other current assets		(25)
Accounts payable		(7)
Accounts payable to affiliates		(35)
Taxes accrued		(60)
Other current liabilities		1
	\$	(81)
FFO / Debt		16.5%

Duke Energy

Upgrading to Buy: Setting a new, more positive tone in the Carolinas

Rating Change: BUY | PO: 85.00 USD | Price: 80.73 USD

Coal ash pending with tide beginning to shift favorably

With DUK shares trading near its relative lows (-1% vs. XLU since 2Q call & more critically a full -110% discount vs the group) we are upgrading to Buy as we perceive a de-risked story acute fears reflected. We see real reason for an inflection in EPS expectations with both positive regulatory backdrop on '21 legislation & positive revisions to IRP capex (based on forthcoming reaction from NC gov/NCUC). While pending coal ash rate case remains outstanding (and much anticipated cautious point), we perceive an order similar to Dominion as quite likely (after latest stakeholder discussions); this would help firm up doubtful expectations. Further, we anticipate existing settlements in the rate case to remain intact despite concerns otherwise too. Fears are likely at their worst heading into 4Q decisions in NC – and see positive EPS & regulatory datapoints arising into '21. Expectations appear to at their low point & investors seem to be missing the positive inflection from regulatory work DUK has been pursuing. Bottom line, analyst EPS expectations of ~\$5.40 on '22 likely understate potential +\$14 Bn in higher capex possible (tables below) & repositioned ESG trajectory.

Sizing up the IRP & Clean Energy Rec.; Tweak EPS higher

Given the recently filed IRP likely gravitating toward the 70% CO₂ reduction scenario with high wind/base hybrid w/ stakeholders (not the 'base plan'), we assume \$1bn of incremental spend in the initial 5yr window vs. \$56bn base plan for T&D interconnect opportunities. This incremental spend moves EPS modestly higher, now forecasting a 5.6% CAGR off the re-based '21 outlook. We perceive the latter 5-10yr window will provide the more meaningful generation spend opportunity (see analysis below) w/ upwards of \$14bn over a 15yr window (including Trans.) w/ DUK's utility renewable ownership assumed at 30% (similar to HB589) given potential concessions on ownership in exchange for accelerated D&A/securitization through the clean energy process. We also apply a 2x premium to DUK's FL ops given constructive regulatory backdrop and 0.5x premium to DEP/DEC due to spending upside. Our PO moves to \$85 (from \$87) on lower peer multiples of 16.5x for electric (from 17.3x) and 14.5x (from 16.4x) for gas.

Estimates (Dec)

(US\$)	2018A	2019A	2020E	2021E	2022E
EPS	4.72	5.06	5.07	5.20	5.44
GAAP EPS	4.69	5.12	5.15	5.28	5.51
EPS Change (YoY)	3.3%	7.2%	0.2%	2.6%	4.6%
Consensus EPS (Bloomberg)			5.08	5.24	5.49
DPS	3.64	3.78	3.85	3.84	3.95

Valuation (Dec)

	2018A	2019A	2020E	2021E	2022E
P/E	17.1x	16.0x	15.9x	15.5x	14.8x
GAAP P/E	17.2x	15.8x	15.7x	15.3x	14.7x
Dividend Yield	4.5%	4.7%	4.8%	4.8%	4.9%
EV / EBITDA*	16.7x	14.4x	13.5x	12.7x	12.0x
Free Cash Flow Yield*	-3.7%	-3.4%	-2.5%	-1.5%	-2.9%

* For full definitions of /Qmethod™ measures, see page 13.

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Refer to important disclosures on page 14 to 16. Analyst Certification on page 11. Price Objective Basis/Risk on page 11.

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Timestamp: 09 September 2020 06:06AM EDT

09 September 2020

Equity

Key Changes

(US\$)	Previous	Current
Inv. Opinion	B-2-7	B-1-7
Inv. Rating	NEUTRAL	BUY
Price Obj.	87.00	85.00
2022E Rev (m)	28,190.8	28,209.5
2022E EPS	5.43	5.44

Julien Dumoulin-Smith

Research Analyst
BofAS
+1 646 855 5855
julien.dumoulin-smith@bofa.com

Richard Ciciarelli, CFA

Research Analyst
BofAS
richard.ciciarelli@bofa.com

Harris Pollans

Research Analyst
BofAS
harris.pollans@bofa.com

Aric Li

Research Analyst
BofAS
aric.li@bofa.com

Anya Shelekhin

Research Analyst
BofAS
anya.shelekhin@bofa.com

Ryan Greenwald

Research Analyst
BofAS
ryan.greenwald@bofa.com

Dariusz Lozny, CFA

Research Analyst
BofAS
dariusz.lozny@bofa.com

Stock Data

Price	80.73 USD
Price Objective	85.00 USD
Date Established	9-Sep-2020
Investment Opinion	B-1-7
52-Week Range	62.13 USD - 103.79 USD
Mkt Val (mn) / Shares Out	59,371 USD / 735.4 (mn)
Average Daily Value (mn)	264.33 USD
BofA Ticker / Exchange	DUK / NYS
Bloomberg / Reuters	DUK US / DUK.N
ROE (2020E)	7.6%
Net Dbt to Eqty (Dec-2019A)	129.8%

NCUC – North Carolina Utility
Commission

iQprofileSM Duke Energy

iQmethodSM – Bus Performance*

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Return on Capital Employed	3.3%	3.9%	3.9%	4.0%	4.0%
Return on Equity	6.2%	8.2%	7.6%	7.6%	7.6%
Operating Margin	19.1%	22.8%	23.0%	23.5%	24.0%
Free Cash Flow	(2,203)	(2,003)	(1,499)	(865)	(1,704)

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Cash Realization Ratio	2.7x	2.7x	2.5x	2.5x	2.4x
Asset Replacement Ratio	2.0x	2.6x	2.2x	2.1x	2.1x
Tax Rate	14.6%	12.7%	12.0%	12.0%	12.0%
Net Debt-to-Equity Ratio	130.8%	129.8%	120.4%	121.0%	124.2%
Interest Cover	2.5x	2.9x	3.0x	3.0x	3.0x

Income Statement Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Sales	24,521	25,079	26,359	27,307	28,210
% Change	4.1%	2.3%	5.1%	3.6%	3.3%
Gross Profit	10,441	11,556	12,276	12,978	13,724
% Change	-3.5%	10.7%	6.2%	5.7%	5.7%
EBITDA	8,848	10,261	10,948	11,633	12,364
% Change	-4.7%	16.0%	6.7%	6.3%	6.3%
Net Interest & Other Income	(2,094)	(2,204)	(2,224)	(2,281)	(2,406)
Net Income (Adjusted)	2,666	3,707	3,719	3,979	4,191
% Change	-12.8%	39.0%	0.3%	7.0%	5.3%

Free Cash Flow Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Net Income from Cont Operations (GAAP)	2,647	3,755	3,779	4,039	4,251
Depreciation & Amortization	4,696	4,548	4,876	5,212	5,581
Change in Working Capital	0	(53)	(95)	(77)	(78)
Deferred Taxation Charge	1,079	1,260	1,100	1,000	400
Other Adjustments, Net	(1,236)	319	(188)	(200)	24
Capital Expenditure	(9,389)	(11,832)	(10,971)	(10,840)	(11,882)
Free Cash Flow	-2,203	-2,003	-1,499	-865	-1,704
% Change	-55.4%	9.1%	25.1%	42.3%	-96.9%

Balance Sheet Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Cash & Equivalents	591	590	675	760	1,047
Trade Receivables	3,134	3,183	3,297	3,381	3,461
Other Current Assets	5,989	5,958	6,100	6,153	6,171
Property, Plant & Equipment	91,694	98,650	104,745	110,373	116,674
Other Non-Current Assets	43,984	43,984	43,984	43,984	43,984
Total Assets	145,392	152,366	158,801	164,651	171,337
Short-Term Debt	6,816	7,167	7,350	7,751	8,286
Other Current Liabilities	8,225	8,190	8,351	8,411	8,431
Long-Term Debt	51,123	53,776	55,151	58,159	62,176
Other Non-Current Liabilities	35,394	35,761	35,633	35,493	35,577
Total Liabilities	101,558	104,894	106,485	109,814	114,471
Total Equity	43,834	46,498	51,342	53,863	55,892
Total Equity & Liabilities	145,392	151,392	157,827	163,677	170,363

* For full definitions of iQmethodSM measures, see page 13.

Company Sector

Electric Utilities

Company Description

Duke Energy Corporation operates as a regulated utility company in the US based in Charlotte, NC. The company operates regulated electric utilities in the Midwest, Florida and the Carolinas and supplies electric service to approximately 7.5 million residential, commercial, and industrial customers. Duke owns 50,000MW of capacity. The regulated gas utilities serve more than 1.6 million customers in the Carolinas and Ohio. A commercial arm owns contract renewables and pipelines across the US.

Investment Rationale

We rate DUK Buy as we see LT growth as intact despite years of negative revisions, by contrast, we see likely de-risking of regulatory compact into '21 legislative session alongside improving capex budget from accelerated coal retirements (beyond base plan presented) as enabling one of few positive inflections in EPS estimates in recent years. Opportunity to re-rate off exceptionally low expectations vs peers.

Stock Data

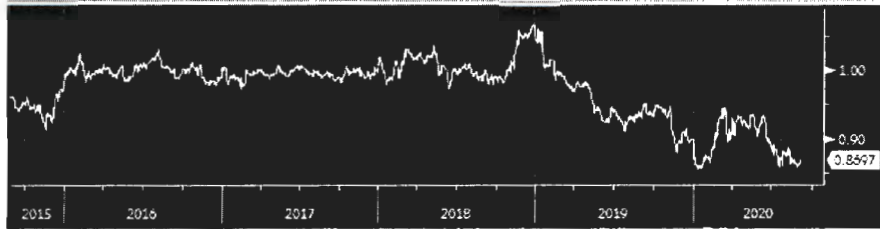
Average Daily Volume 3,242,689

Quarterly Earnings Estimates

	2019	2020
Q1	1.24A	1.14A
Q2	1.12A	1.08A
Q3	1.79A	1.82E
Q4	0.93A	1.03E



Exhibit 1: DUK FY2 PE vs. IXU



Source: Bloomberg

We upgrade DUK shares as we perceive few negatives remaining for shares after a consistent set of pressures in recent years. While the most cautious of which could still materialize (formally) around its rate case, we perceive management has effectively risk-adjusted its recently reduced EPS guidance with 2Q. We perceive that this reset effectively addressed many of the legacy issues. With expectations just so low, we perceive very little in the form of a positive as necessary to drive a re-rate in shares higher. For instance, in our case, simple affirmation of coal ash precedent utilized in the Dominion rate case for Duke would be sufficient (appears quite likely following recent discussions with stakeholders). With Street still seemingly concerned of further reductions to '21 EPS (we don't believe that sell-side expectations have re-rated alongside investor expectations re-rate down to new lower 4-6% CAGR)- we just don't believe those will materialize. By contrast, we see positive capex revisions at its upcoming ESG Analyst Day on October 9th as enabling among the few positive EPS revisions of late. Moreover, we see substantially greater traction for meaningful regulatory reform and for a more aggressive adoption of renewables capex post-election as well. 2021 looks set to see a meaningfully improved backdrop for DUK considering the various potential outcomes of 'another' shot at legislation (this time, with what seems like a meaningfully improved set of stakeholders supporters). Prospects such as multi-year rate plans (to avoid consecutive cases), ROE banding, and performance based rates (PBR) all appear quite possible.

But what is the peer set – quite low on expectations despite historically intact outlook for utilities?

While DUK has suffered a series of regulatory losses over the past year, including the cancelation of Atlantic Coast, excavation order from the DEQ, and potential absence of return on coal ash spending (once past the deferral period) from the pending rate cases, we perceive the company's risk profile and business mix to be in much better shape than other peers that trade a similar discount to the group. We see risks associated with the rate case as manageable despite the recent pushback on grid mod as we see approval as likely and see risks with coal ash as largely priced-in (reflecting the incremental regulatory lag in our assumptions). While the ruling from the Supreme Court will likely dictate recovery of coal ash going forward (presenting modest downside risk), we expect the commission will largely take their cues from the recent Dominion order.

With shares now nearly de-risked in our view (absent the pending coal ash outcome), we perceive a signal of confidence in NC could stem from the IRP outcome and (inaugural?) ESG day on Oct. 9 (where we expect mgmt. to highlight 2-3 scenarios from the IRP most likely to take hold as well as more granular capex details associated with them). Moreover, we see stakeholder alignment associated with the Clean Energy Agenda where we could see several constructive rate making proposals move forward, including: Multi-year rate plans (MYRP), decoupling, accelerated depreciation, and/or legislative changes around the least cost approach in the IRP (to open up more renewable opportunities). Bottom line, we perceive DUK's EPS quality to not be materially different from peers that trade at higher levels with clear upside to the story if the company can execute on the NC pivot.



So what is the real risk here that isn't fully appreciated?

We stress the next date the Supreme Court can issue a decision for the 2017 coal ash appeal is Sept. 25 (or if not in Dec.), and with no statutory time frame on a rate case decision it could be conceivable that the NCUC receives its cues from the higher court. Still given precedent from the D order and commentary from hearings, we see a 10yr amortization and no return on past the deferral period as base case w/ 6-8c impact reflected in our EPS estimates. We stress Supreme Court doesn't need to follow any earlier precedent but would still expect some form of return on equity – we see the earlier NCUC decision as an elegant solution to addressing even brief periods of return on coal ash (and full recovery of associated principle). There is no mandated timeline to address this case (having been pending for some time). Bottom line, we perceive some potential for modestly reduced EPS here as the principle remaining risk – this doesn't appear necessarily likely (focus of courts will be on legalities rather than ratepayers outcomes of what total amount is eligible for recovery)– and as such as see positives on balance as outweighing risks in near-term for our upgrade.

Incremental capex opportunities w/ recent IRP filing

We continue to expect Duke's capex outlook to be reset higher with the company's 2020 Integrated Resource Plan (IRP) that was filed September 1st. DUK outlined six paths to achieve the realization of cleaner energy in both NC and SC encapsulating the company's goal of 50% carbon emissions reductions by 2030 across all of the six options, and two of the options were aligned with the NC governor's carbon emission reduction goal of 70% by 2030. The IRP's base case without carbon policy is mostly in line with the company's 2018 IRP except for an incremental 500 MW of storage + 250MW of solar largely offset by 1,400 MW less new gas gen (9,600 MW vs prior 11,000 MW). All of the other 2020 IRP options aside from this base case imply incremental capex upside to the current \$56bn 5-yr plan (2020-2024) in addition to substantial incremental investment in the subsequent five years (2025-2029). See our recent update following the IRP filing here: [DUK: When Base Doesn't Quite Seem like the Base Plan](#).

This IRP was broader than usual, as the commission will look for a reasonable balance between the lowest cost plan for customers and maximizing de-carbonization efforts. Hence, the multiple scenarios allow for flexibility, providing the commissions and stakeholders a number of options when weighing in on the plan that is most aligned with both customers and de-carbonization targets. We see this as a politically astute move, albeit the immediate reaction may indeed prove less immediately constructive by investors who may not fully appreciate the positioning of this document. Note only in SC is the IRP explicitly approved or rejected, while a process is opened up in NC with interveners opining. We could see the IRP approval process kicked to the 2022 IRP filing given most generation needs are not likely to occur near-term, although see the 2020 IRP setting the stage for this.

Just what is the capex opportunity?

Given the IRP is an adjudicated process and the Clean Energy Plan reaches the Governor at the end of December, we assume a more formal detailed capex update is not likely to occur until 4Q20 results in February 2021. We do highlight that Duke will be hosting an inaugural ESG day on October 9 to provide more details around three of the six options outlined in the IRP that have the most stakeholder interest (i.e. most likely). *The base plan without carbon policy is the lowest cost planning scenario and in line with the current 5-yr plan. Hence, this does not imply any upside to the current 5-yr capital program. The options that aligned with the governor's 70% carbon reduction target along with the no new gas option implies incremental capex relative to the \$56bn plan through '24 (albeit with most opportunities occurring in the latter half of the decade).* We expect most for the renewable CPCN's will likely be filed 3yrs out from the expected in-service date, with most of the coal replacement capacity build to occur from '25-30 time frame, although could see T&D opportunities potentially accelerated (given limitations on solar without meaningful investments to alleviate congestions). Note three of the six scenarios leave

zero remaining dual fuel coal capacity by 2035 while the two base cases with and without carbon policy leave 3,050 MW of Dual Fuel coal capacity post 2035 and the “no new gas generation” leaves 2,200 MW remaining post 2035. Below we lay out the economic retirement dates of coal plants where it is clear the bulk of the retirements occur during 2025-2035, which is likely aligned with much of the necessary renewable capex to replace the retired coal capacity.

Table 1: Economic Retirement dates of coal plants from Sequential Peaker Method (SPM)

Coal Plant	Base Case with or without CO2 Policy:	
	Most Economic Retirement Year	Capacity (MW)
Allen 2-4	2022	677
Allen 1 & 5	2024	421
Cliffside 5	2026	526
Roxboro 3 & 4	2028	1,409
Roxboro 1 & 2	2029	1,053
Mayo 1	2029	746
Marshall 1-4	2035	2,078
Belews Creek 1	2039	1,110
Belews Creek 2	2039	1,110
Cliffside 6	2049	830
Total Incremental Retirements 2020-2024 (MW)		1,098
Total Incremental Retirements 2025-2029 (MW)		3,734
Total Incremental Retirements 2030-2035 (MW)		2,078
Total Incremental Retirements beyond 2035 (MW)		3,050

Source: BoFA Global Research estimates, company report, Bloomberg

We also assume DUK will only be able to own 30% of utility-scale renewables (specifically solar and wind) as a starting point given precedent from HB589 for solar. We also conservatively assume DUK will only own 30% of storage but acknowledge upside to this assumption. We stress the timing/pace, type of renewable deployment (solar/storage, wind, offshore, standalone storage, nat gas), and total amount that DUK can own will very much be dictated by the Clean Energy stakeholder process and general assembly/governor elections. Lastly, we assume DUK owns 100% of the associated T&D. In total, we could see upwards of \$14bn in capex (including Transmission although absent distribution) over a 15yr period based on our various assumptions below. Below we breakdown this hypothetical renewable capex opportunity by using the base plan without carbon policy as the low end of the range and the 70% CO2 reduction; High Wind Plan as the high end of the range. Recall, the Base without carbon policy is roughly in line with the current long term plan and incorporates absolute least cost planning. After speaking with a number of stakeholders, the 70% Carbon Reduction; High Wind plan seems to be aligned with the interests of most of the parties, particularly Governor Cooper's 70% carbon emission reduction target. We expect the Duke's final plan to shake out somewhere between these two pathways with the average implied incremental capex over the next 15 years relative to the current plan to be about \$7bn (including T&D).

Table 2: DUK Hypothetical Renewable Capex Opportunity stemming from the IRP process

DUK Hypothetical Renewable Capex Calc	Base without CO2 Policy	70% CO2 Reduction; High Wind
	Low	High
SOLAR		
Solar MW	250	7,850
% Ownership Assumption (Solar)	30%	30%
Owned Solar MW	75	2,355
\$/kw	1,200	1,200
Solar Capex Net to DUK (\$mn)	90	2,826
ONSHORE WIND		
Wind (MW)	0	2,850
% Ownership Assumption (Wind)	30%	30%
Owned Wind MW	0	855
\$/kw	1,500	1,500
Wind Capex Net to DUK (\$mn)	0	1,283
OFFSHORE WIND		
Offshore Wind (MW)	0	2,650
% Ownership Assumption (Offshore)	30%	30%
Owned Wind MW	0	795
\$/kw	3,000	3,000
Offshore Wind Capex Net to DUK (\$mn)	0	2,385
STORAGE		
Storage MW	500	3,850
% Ownership assumption (storage)	30%	30%
Storage MW	150	1,155
\$/kW	4,000	4,000
Storage Capex Net to DUK (\$mn)	600	4,620
NATURAL GAS		
Natural Gas (MW)	-1,400	-4,600
% Ownership Assumption (Nat Gas)	100%	100%
Natural Gas MW	-1,400	-4,600
\$/kw	1,000	1,000
Nat Gas Capex Net to DUK (\$mn)	-1,400	-4,600
TOTAL		
OWNED MW	225	5,160
Total MW	-650	12,600
Implied \$/kW on Owned Renewables	3,067	2,154
Total Renewable Capex Net to DUK(\$mn)	690	11,114
Total Renewable T&D Capex net to DUK (\$mn)	1,000	7,500
Less: Lower Nat Gas Capex Net to DUK (\$mn)	-1,400	-4,600
Incremental Capex net to DUK 2020-2035 (\$mn)	290	14,014
Avg Incremental Capex net to DUK 2020-2035 (\$mn)		7,152

Source: BoFA Global Research estimates, company report

North Carolina Offshore wind considerations

Avangrid Renewables won the Kitty Hawk offshore wind area bid from the federal government to lease 122,405 offshore acres off the coast of North Carolina and Virginia, and has begun the process of studying the area as part of early stage project development. Early indications are the Wind Energy Area (WEA) has potential to yield around 2.5GW of offshore wind. This compares to two of Duke's six pathways outlined in the 2020 IRP ("70% CO2 reduction; High Wind" and "No New Gas Generation"), which both call for 2,650 MW of offshore wind.

With North Carolina stakeholder discussions noting that there is a growing interest in offshore wind, we wonder if DUK could potentially partner with AGR or move further down to the southern portion of the state where a lease has not yet been opened yet. Mgmt. highlighted on its 2Q call, that the IRP could provide some visibility into this opportunity. Below, we assume just 20% of capacity would be replaced with offshore wind, with DUK having a 30% carve out of that amount.

Rate Case Expectations: coal ash Dominion order likely

We continue to expect DUK's rate case in the Carolinas to have a similar outcome to Dominion's coal ash order with a 10yr amortization period and no return once past the

deferral period. Recall, the key issues which Duke and the other parties have not reached a settlement on include: matters related to the recovery of and on coal ash basin expenditures in addition to the amount of annual depreciation expense, including accelerated depreciation on certain coal-fired generation plants.

We perceive testimony from CFO, Steve Young, was much stronger in response to some of the staff questioning. Specially, DUK's CFO pointed to the need for a strong credit rating due to the company's hurricane prone service territory (w/ sizeable storm costs still on its books), its need to operate its nuclear plants and access cheap capital, as well as the long-term implications that would result from a credit downgrade (given minimal impact on interest rates costs from a downgrade w/ all rates depressed due the fed backing of treasuries). Further, company testimony pointed out that its service territories in IN and FL receive a return on and of capital for coal ash spend as well as DUK's large-cap peers (SO, AEP, D in VA).

While commissioners did not provide any commentary one way or another, our base case coal ash outcome is in line with D's precedent, and we already reflect this in our estimates with ~30bps of lag in the out years ('23 and beyond) as we expect Duke will offset most of the lag next year and into '22 with cost mitigation. This translates to ~6-8c of drag per year vs mgmt. estimates of 5-10c/yr. We stress that with the next date the Supreme Court can issue a decision for the 2017 coal ash appeal is Sept. 25 (or if not in Dec.) and with no statutory time frame on a rate case decision, it could be conceivable that the NCUC waits for an order until it receives its cues from the higher court. The pending order from the Supreme Court remains largely unknown/cautious although see risks of the negative revisions priced-in/largely known and likely to set the precedent for future recovery and put the issue to bed once and for all.

Expect grid mod settlement to be approved despite recent pushback

Following the recent select Commissioner pushback on Duke's grid-improvement plan (GIP or grid-mod), we wanted to clarify this pushback and also make sure to note the positive tone the following day (Aug 28) supporting the previously settled items. Recall, on July 31, 2020, pursuant to the stipulations, DEC, DEP and the Public Staff agreed to total deferral treatment for about \$1.3bn of grid improvement projects i.e. GIP (vs \$2.4bn total requested) as part of their multifaceted partial settlement (see [here](#) for our report on DEC/DEP partial settlement including other terms). In the hearings, three Commissioners seemed to raise the concern around the GIP settlement including: McKissick, Clodfelter and Duffley. Duke noted that if the company did not receive the deferral, it would experience >100bps ROE impact by 2022 (third year of the GIP). Most of these commissioners' concern was around the lack of clarity with regard to determining whether or not the GIP was actually achieving its goals and aligning benefit/costs with customers accordingly. Specifically, there was concern with the significant percentage of GIP program costs allocated to residential customers while a very large percentage of the benefits flows to C&I customers.

However, Duke made clear in the Aug 28 hearing that when you back out the costs not associated with reliability (37% of the costs), 92% of the costs associated with reliability benefits are allocated to customers on the self-optimizing grid, which are all residential. Hence, residential customers bear the higher allocation of GIP program costs, but also receive the most benefit from a reliability standpoint. Lastly, we would highlight also on August 28th, it is emphasized by Mr. Ledford from the NCSEA that expert witnesses Paul Alvarez and Dennis Stephens, who previously had reservations about GIP and actually originally recommended to reject the GIP, now support the settlement for the pared down GIP – a positive sign that Duke notes reflects the value of stakeholder engagement. We note our conversation with stakeholders indicated a much improved proposal vs. the one just 3yrs ago. Bottom line, despite the pushback we believe the GIP settlement is likely approved by the commission and look for additional data points on hearings this week and beyond.



Alternative rate making mechanisms in legislation next?

We continue to perceive an opportunity for alternative rate mechanisms to move forward, such as Performance Based Rates (PBRs), Multi-year rate plans (MYRPs), ROE banding, securitization/accelerated depreciation, riders and others. We believe there remains potential for Duke to have a recommendation back to the legislation that would include some type of combination of these alternative mechanisms. All of these tools would be positive for Duke, but there are a number of steps it will take to get there as past efforts stalled/failed. With that said, we see both increased confidence from the company and corresponding stakeholder commentary as supportive for DUK's legislative prospects in the 2021 long session, although wouldn't be implemented in a rate case until 2023. Moreover, we don't perceive mgmt.'s updated growth trajectory relies on any one of these items in particular, although do see ability to garner a constructive outcome as further de-risking the EPS outlook.

What about the SE Energy Market?

Several Southeastern utilities (DUK, SO, D) announced that they are exploring the creation of a regional, intra-hour energy exchange called the Southeast Energy Exchange Market (SEEM). This comes after years of a contemplated Southeast regional transmission operator. While the ultimate hopes are that it could be an initial step towards reducing customer bills and other proposals have been more extreme (such as retail de-regulation), *we perceive an initial stumbling block could be the way in which DUK/SO proposed the market rather than through a stakeholder process.* Initial indication from the utilities is that it could save rate payers \$40mn/yr compared to a consultant study that suggested up to \$360bn in savings. While discussions remain in its infancy, we perceive there could be more pushback/skepticism/debate over which reforms ultimately take shape.

FL regulatory construct remains sound

Duke Energy Florida is proposing to spend ~\$1bn on 750 MW of solar projects across Florida in the next three years with ~\$500mn incremental vs. what is currently expected to be spent in FL. Given both the incremental spend opportunities and constructive regulatory backdrop where the company has the ability to garner another Multi-year rate plan (filing expected at end of 2021) and has above-average ROEs, we move to a 2x (from 1x) premium in this jurisdiction.

EPS Estimates

We raise our EPS assumptions modestly in '22-'25, and our implied EPS CAGR '25 is 60bps above the mid-point at 5.6% (off the \$5.15 base) as we factor in incremental capex from IRP at DEC and DEP. While our EPS estimates remain below consensus, we perceive the outlook to be de-risked as mgmt. can likely execute at the upper-end of the re-based 4-6% CAGR. While we remain -5c below formal Street estimates, we perceive investor expectations are already using at or below revised guidance midpoint suggesting closer to ~\$5.40 mark on '22 expectations. We perceive positive capex revisions alongside confidence in mgmt's ability to hold the line on costs into '21 & '22 should enable a consistent earned ROE trend in the Carolinas to drive this outcome. Moreover, mgmt. has been quite diligent in tactfully avoiding equity after its latest ACP pipeline setback – and perceive at least for now no further equity announcements as also helping to de-risk the backdrop.

Table 3: DUK EPS Estimates

EPS Estimates	2019A	2020E	2021E	2022E	2023E	2024E	2025E
Electric							
Carolinas	1.95	1.90	1.86	1.92	1.97	2.06	2.15
Indiana	0.60	0.61	0.62	0.64	0.66	0.68	0.71
Ohio - Electric	0.22	0.25	0.25	0.27	0.30	0.35	0.39
Progress- Carolinas	1.12	1.15	1.17	1.22	1.25	1.27	1.31
Progress- Florida	0.96	0.97	1.02	1.03	1.05	1.08	1.09
Commercial Transmission	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eliminations	-0.04	0.00	0.00	0.00	0.00	0.00	0.00
Consolidated Earnings	4.81	4.88	4.92	5.07	5.24	5.44	5.65
Guidance	4.77	4.94					
Gas							
Ohio - Gas	0.12	0.14	0.16	0.19	0.20	0.21	0.22
Piedmont (PNY)	0.27	0.31	0.33	0.37	0.41	0.45	0.49
Midstream Pipelines	0.24	0.11	0.04	0.05	0.06	0.08	0.09
Eliminations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consolidated Earnings	0.62	0.56	0.53	0.61	0.67	0.74	0.81
Guidance	0.51	0.72					
Commercial Renewables	0.27	0.32	0.33	0.30	0.28	0.29	0.22
Guidance	0.32	0.33					
Parent/Other	-0.64	-0.69	-0.58	-0.54	-0.46	-0.42	-0.28
Guidance	-0.60	-0.73					
Adjustments							
BofAe EPS	5.07	5.07	5.20	5.44	5.72	6.04	6.39
Previous Estimates	5.06	5.07	5.20	5.43	5.71	6.02	6.36
Guidance	4.95-5.15	5.05-5.45					
Consensus	5.02	5.08	5.24	5.49	5.84	6.20	7.04
Mgmt EPS CAGR: 4-6% from 2019-2024E (old)	5.00	5.25	5.51	5.79	6.08	6.39	
Low End	4.80	5.05	5.41	5.62	5.85	6.08	
High End	5.20	5.45	5.62	5.96	6.31	6.69	
BofAe CAGR '19-'24e						3.9%	
Mgmt EPS CAGR: 4-8% off '21 expected \$5.15 base (new)			5.15	5.41	5.68	5.96	6.26
Low End				5.36	5.57	5.79	6.02
High End				5.46	5.79	6.13	6.50
BofAe CAGR '21-'25e							5.6%

Source: BofA Global Research estimates, company report, Bloomberg

Valuation

Our PO moves to \$85 (from \$87) on lower 22E peer multiples (disc. back one yr) of 16.5x for electric (from 17.3x) and 14.5x (from 16.4x) for gas and more than offset our modestly higher EPS estimates. . We also apply a 2x premium to DUK's FL ops given constructive regulatory backdrop and 0.5x premium to DEP/DEC due to spending upside. We perceive a potential inflection heading into '21 off de-risked rate case outlook subsequent to full NCUC decision on case & coal ash recovery. We perceive the reduced outlook already reflects an eventual normalization in earned returns & regulatory outcomes. We perceive a continued clear potential for positive revisions with capex articulated – and subsequently into the capex process too will further drive confidence in shares. We see potential higher re-rating after several years of more cautious EPS revisions & datapoints. With its peer Dominion having been able to re-rate positively on ESG-related datapoints in recent months, we see its peer set as enabling a positive revision all the more as it meaningfully accelerates its coal retirements (likely) as NC executive & legislature more formally tackle energy issues in coming year.



Table 4: DUK SOTP Valuation

Duke Energy Sum of the Parts Valuation

2022E

All figures in \$Mn except per share

	Metric	P/E Multiple						Equity Value		
		2022 EPS	Low	Peer	Prem/Discount	Base	High	Low	Base	High
Group Peer Multiple - Electric				16.6x						
Group EPS '18-'22 CAGR - Electric				5.00%						
Electric Utilities				17.3x						
Duke Energy Carolinas	\$1.92	16.8x		0.5x	17.8x	18.8x	\$32.24	\$34.15	\$36.07	
Duke Energy Progress/Carolinas	\$1.22	16.8x		0.5x	17.8x	18.8x	\$20.48	\$21.70	\$22.92	
Duke Energy Florida	\$1.03	18.3x		2.0x	19.3x	20.3x	\$18.81	\$19.83	\$20.86	
Duke Energy Indiana	\$0.64	17.3x		1.0x	18.3x	19.3x	\$11.00	\$11.64	\$12.27	
Duke Energy Ohio/Kentucky	\$0.27	16.3x		0.0x	17.3x	18.3x	\$4.42	\$4.69	\$4.96	
Total Electric Utility Value	\$5.07						\$86.95	\$92.02	\$97.08	
Group Peer Multiple - Gas				14.5x						
Group EPS '18-'22 CAGR - Gas				5.10%						
Gas Utilities				15.2x						
Duke Energy Piedmont	\$0.37	14.2x		0.0x	15.2x	16.2x	\$5.27	\$5.64	\$6.01	
Duke Energy Ohio/Kentucky Gas	\$0.19	14.2x		0.0x	15.2x	16.2x	\$2.66	\$2.84	\$3.03	
Total Gas Utility Value	\$0.56						\$7.92	\$8.48	\$9.04	
Commercial Segment		2022 EBITDA								
Remaining Midstream assets	\$107	8.0x	9.0x	0.0x	9.0x	10.0x	859	967	1,074	
Transmission Segment	\$6	8.0x	9.0x	0.0x	9.0x	10.0x	52	58	64	
Segment Net Debt	-\$3,623						-3,623	-3,623	-3,623	
Add back Renewable Debt	\$2,468						2,468	2,468	2,468	
Renewables Segment NPV @ 8% Discount	\$1,291						1,291	1,291	1,291	
New Renewables NPV	\$471						471	471	471	
Net Infrastructure Equity							1,518	1,632	1,746	
Net Infrastructure Equity Per Share							\$2.08	\$2.10	\$2.39	
Parent		2022 EPS								
NMC (Saudi Chemical JV)	\$0.05	10.3x		-6.0x	11.3x	12.3x	\$0.52	\$0.57	\$0.62	
Parent Interest attributed to utility - 50%	-\$0.54	18.9x		0.0x	17.9x	16.9x	-\$5.05	-\$4.78	-\$4.52	
Parent Debt- 50%	-\$20,761						-\$13.38	-\$13.38	-\$13.38	
Total Equity Value							-\$17.91	-\$17.60	-\$17.28	
Shares Outstanding							776			
Total Equity Value							\$79.00	\$85.00	\$91.00	
Current Share Price							\$80.73	\$80.73	\$80.73	
NTM Dividend Yield							4.74%			
Total Potential Return							10.03%			

Source: BoFA Global Research estimates, company report, Bloomberg



Price objective basis & risk

Duke Energy (DUK)

Our \$85 PO is derived from a sum-of-the-parts valuation. We value the Electric and Gas utilities using peer 2022E P/E multiples. We apply a 2.0x multiple premium to Duke's operations in FL/IN to reflect more favorable regulatory environments. We apply a 0.5x multiple to the Carolinas given upside to spending in improving regulatory construct combined with latest IRP. We value the other regulated electric utilities at 16.5x and the gas utilities at peer group multiples of 14.5x 2022E P/E, respectively. Both electric and gas peer P/E multiples are grossed up by 5% for the groups CAGR to reflect capital appreciation across the sector. The commercial midstream, and transmission are valued on a 2022E EV/EBITDA basis. We use a 9.0x multiple for midstream and transmission segment. We add the net present value of renewable segment using an 8% discount rate. We subtract out the impact of commercial debt, and add back for the renewable debt.

Upside risks: constructive rate case results, higher capital expenditure additions vs our assumptions, lower interest rates. Downside risks: poor rate case results, operating errors, and negative changes in the regulatory environment, Macro risks: Increases in interest rates and decreases in equity market valuations.

Analyst Certification

I, Julien Dumoulin-Smith, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.



North American Utilities, Alternative Energy & LNG Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	AES	AES	AES US	Julien Dumoulin-Smith
	Alliant Energy Corporation	LNT	LNT US	Julien Dumoulin-Smith
	AltaGas	YALA	ALA CN	Julien Dumoulin-Smith
	Atlantica Yield	AY	AY US	Julien Dumoulin-Smith
	Atmos Energy Corporation	ATO	ATO US	Richard Ciciarelli, CFA
	Avista	AVA	AVA US	Richard Ciciarelli, CFA
	Clearway Energy	CWENA	CWEN/A US	Julien Dumoulin-Smith
	Clearway Energy	CWEN	CWEN US	Julien Dumoulin-Smith
	CMS Energy	CMS	CMS US	Julien Dumoulin-Smith
	Consolidated Edison	ED	ED US	Julien Dumoulin-Smith
	DTE Energy	DTE	DTE US	Julien Dumoulin-Smith
	Duke Energy	DUK	DUK US	Julien Dumoulin-Smith
	Edison International	EIX	EIX US	Julien Dumoulin-Smith
	Emera Inc	YEMA	EMA CN	Julien Dumoulin-Smith
	Entergy	ETR	ETR US	Julien Dumoulin-Smith
	Essential Utilities	WTRG	WTRG US	Julien Dumoulin-Smith
	Evergy, Inc	EVRG	EVRG US	Julien Dumoulin-Smith
	First Solar, Inc.	FSLR	FSLR US	Julien Dumoulin-Smith
	FirstEnergy	FE	FE US	Julien Dumoulin-Smith
	Idacorp	IDA	IDA US	Julien Dumoulin-Smith
	NextEra Energy	NEE	NEE US	Julien Dumoulin-Smith
	NRG Energy	NRG	NRG US	Julien Dumoulin-Smith
	OGE Energy Corp	OGE	OGE US	Julien Dumoulin-Smith
	PG&E Corporation	PCG	PCG US	Julien Dumoulin-Smith
	PNM Resources Inc.	PNM	PNM US	Julien Dumoulin-Smith
	PPL Corporation	PPL	PPL US	Julien Dumoulin-Smith
	Sempra Energy	SRE	SRE US	Julien Dumoulin-Smith
	Spire	SR	SR US	Richard Ciciarelli, CFA
	Sunnova Energy	NOVA	NOVA US	Julien Dumoulin-Smith
	SunRun	RUN	RUN US	Julien Dumoulin-Smith
	Vistra Energy	VST	VST US	Julien Dumoulin-Smith
NEUTRAL				
	Ameren Corporation	AEE	AEE US	Julien Dumoulin-Smith
	American Electric Power	AEP	AEP US	Julien Dumoulin-Smith
	Avangrid	AGR	AGR US	Julien Dumoulin-Smith
	Black Hills Corporation	BKH	BKH US	Julien Dumoulin-Smith
	CenterPoint Energy	CNP	CNP US	Julien Dumoulin-Smith
	Cheniere Energy Inc	LNG	LNG US	Julien Dumoulin-Smith
	Dominion Energy	D	D US	Julien Dumoulin-Smith
	Hannon Armstrong	HASI	HASI US	Julien Dumoulin-Smith
	Hydro One	YH	H CN	Julien Dumoulin-Smith
	NextDecade	NEXT	NEXT US	Julien Dumoulin-Smith
	NextEra Energy Partners	NEP	NEP US	Julien Dumoulin-Smith
	NiSource Inc	NI	NI US	Julien Dumoulin-Smith
	ONE Gas, Inc.	OGS	OGS US	Richard Ciciarelli, CFA
	Pinnacle West	PNW	PNW US	Julien Dumoulin-Smith
	Portland General Electric Company	POR	POR US	Julien Dumoulin-Smith
	Public Service Enterprise Group	PEG	PEG US	Julien Dumoulin-Smith
	Southern Company	SO	SO US	Julien Dumoulin-Smith
	Southwest Gas Holdings	SWX	SWX US	Richard Ciciarelli, CFA
	Tellurian Inc	TELL	TELL US	Julien Dumoulin-Smith
	Xcel Energy Inc	XEL	XEL US	Julien Dumoulin-Smith
UNDERPERFORM				
	Algonquin Power & Utilities Corp	AQN	AQN US	Julien Dumoulin-Smith
	Algonquin Power & Utilities Corp	YAQN	AQN CN	Julien Dumoulin-Smith
	American Water Works	AWK	AWK US	Julien Dumoulin-Smith
	Bloom Energy	BE	BE US	Julien Dumoulin-Smith
	Eversource Energy	ES	ES US	Julien Dumoulin-Smith
	Exelon	EXC	EXC US	Julien Dumoulin-Smith
	Fortis	YFTS	FTS CN	Julien Dumoulin-Smith
	Fortis Inc	FTS	FTS US	Julien Dumoulin-Smith
	Hawaiian Electric Industries	HE	HE US	Julien Dumoulin-Smith
	MGE Energy	MGEE	MGEE US	Julien Dumoulin-Smith
	New Jersey Resources Corp	NJR	NJR US	Richard Ciciarelli, CFA



North American Utilities, Alternative Energy & LNG Coverage Cluster

Investment rating	Company	BoFA Ticker	Bloomberg symbol	Analyst
	Northwest Natural Holdings	NWN	NWN US	Richard Ciciarelli, CFA
	NorthWestern Corporation	NWE	NWE US	Julien Dumoulin-Smith
	South Jersey Industries	SJI	SJI US	Richard Ciciarelli, CFA
	SunPower Corp.	SPWR	SPWR US	Julien Dumoulin-Smith
	Unitil Corporation	UTL	UTL US	Julien Dumoulin-Smith
	WEC Energy Group Inc	WEC	WEC US	Julien Dumoulin-Smith
RSTR				
	Vivint Solar	VSLR	VSLR US	Julien Dumoulin-Smith

iQmethodSM Measures Definitions

Business Performance	Numerator	Denominator
Return On Capital Employed	NOPAT = (EBIT + Interest Income) * (1 - Tax Rate) + Goodwill Amortization	Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill Amortization
Return On Equity	Net Income	Shareholders' Equity
Operating Margin	Operating Profit	Sales
Earnings Growth	Expected 5-Year CAGR From Latest Actual	N/A
Free Cash Flow	Cash Flow From Operations – Total Capex	N/A
Quality of Earnings		
Cash Realization Ratio	Cash Flow From Operations	Net Income
Asset Replacement Ratio	Capex	Depreciation
Tax Rate	Tax Charge	Pre-Tax Income
Net Debt-To-Equity Ratio	Net Debt = Total Debt, Less Cash & Equivalents	Total Equity
Interest Cover	EBIT	Interest Expense
Valuation Toolkit		
Price / Earnings Ratio	Current Share Price	Diluted Earnings Per Share (Basis As Specified)
Price / Book Value	Current Share Price	Shareholders' Equity / Current Basic Shares
Dividend Yield	Annualised Declared Cash Dividend	Current Share Price
Free Cash Flow Yield	Cash Flow From Operations – Total Capex	Market Cap. = Current Share Price * Current Basic Shares
Enterprise Value / Sales	EV = Current Share Price * Current Shares + Minority Equity + Net Debt + Other LT Liabilities	Sales
EV / EBITDA	Enterprise Value	Basic EBIT + Depreciation + Amortization

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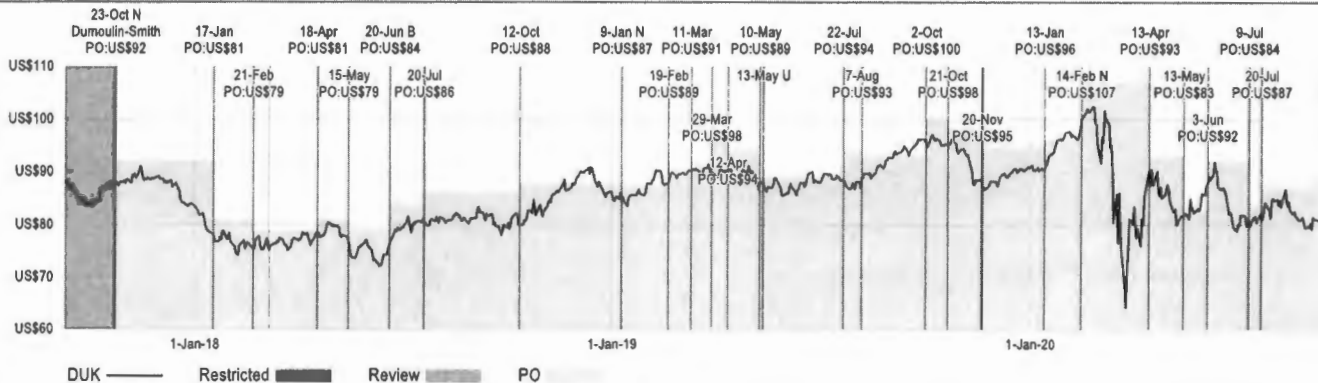
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Disclosures

Important Disclosures

Duke Energy (DUK) Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

Equity Investment Rating Distribution: Utilities Group (as of 30 Jun 2020)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	76	51.01%	Buy	56	73.68%
Hold	33	22.15%	Hold	22	66.67%
Sell	40	26.85%	Sell	29	72.50%

Equity Investment Rating Distribution: Global Group (as of 30 Jun 2020)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1632	52.21%	Buy	1031	63.17%
Hold	711	22.74%	Hold	444	62.45%
Sell	783	25.05%	Sell	407	51.98%

* Issuers that were investment banking clients of BoFA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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Duke Energy

The Feedback from our Upgrade

Reiterate Rating: BUY | PO: 85.00 USD | Price: 82.00 USD

What is so controversial? Feedback on our upgrade

Following our earlier upgrade of shares from Neutral to Buy this week, we revisit the key debates among some investors. We stress a broad perception we may be too early in getting constructive on shares where recent track record would suggest a need to await further execution & avoid pitfalls. To this perception, we stress less downside than feared, reflected principally in the form of less exposure to a negative Supreme Court case (pending before NC from its last rate case). While the current rate cases focuses on prospective recovery (and we anticipate a similar outcome to Dominion), the court has yet to rule on only ~\$500mn of coal ash spend in rates today from the '17 rate case, limiting NT EPS revisions if the order aligns w/ D's outcome. The next date the Supreme Court can issue a decision is Sept. 25 (or if not in December). With no statutory time frame on a rate case decision, timing of NCUC order could correspond w/ cues from the higher court. Ultimately, we perceive a variety of scenarios are reflected in updated EPS CAGR figures as well as balance sheet (no further equity needs). Bottom line, we remain quite confident on our call given both accelerated nature of datapoints & greater de-risking in NC than widely appreciated by Street. Reiterate Buy.

Further upside on capex & CAGR ahead with the IRP too

Additionally, assuming the final IRP path is more aligned with the NC Governor's 70% carbon reduction target, we see upside to out-year EPS estimates from incremental renewable capex to replace coal retirements (potentially leading to RAB growth of upwards of ~7% from 6% today). We currently bake in minimal EPS impact within the current 5-yr plan from potential incremental renewable capex. On timing here too – we perceive the recommendation from the key stakeholder group should lead to a much clearer view of just which incremental renewable plan will be adopted by December including specifics on just which regulatory reforms could be adopted as well. Further, we see the election (in which incumbent Democrats continue to poll quite well) as a likely positive given potential for execution to continue under existing administration.

Estimates (Dec)

(US\$)	2018A	2019A	2020E	2021E	2022E
EPS	4.72	5.06	5.07	5.20	5.44
GAAP EPS	4.69	5.12	5.07	5.20	5.44
EPS Change (YoY)	3.3%	7.2%	0.2%	2.6%	4.6%
Consensus EPS (Bloomberg)			5.07	5.23	5.50
DPS	3.64	3.78	3.85	3.84	3.95

Valuation (Dec)

	2018A	2019A	2020E	2021E	2022E
P/E	17.4x	16.2x	16.2x	15.8x	15.1x
GAAP P/E	17.5x	16.0x	16.2x	15.8x	15.1x
Dividend Yield	4.4%	4.6%	4.7%	4.7%	4.8%
EV / EBITDA*	16.8x	14.5x	13.6x	12.9x	12.1x
Free Cash Flow Yield*	-3.7%	-3.3%	-2.4%	-1.5%	-2.9%

* For full definitions of *IQmethod™* measures, see page 7.

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Timestamp: 11 September 2020 07:03AM EDT

11 September 2020

Equity

Key Changes

(US\$)	Previous	Current
2020E Rev (m)	26,358.5	26,387.5
2021E Rev (m)	27,307.0	27,238.3
2022E Rev (m)	28,209.5	28,144.3

Julien Dumoulin-Smith

Research Analyst
BofAS
+1 646 855 5855
julien.dumoulin-smith@bofa.com

Richard Ciciarelli, CFA

Research Analyst
BofAS
richard.ciciarelli@bofa.com

Harris Pollans

Research Analyst
BofAS
harris.pollans@bofa.com

Aric Li

Research Analyst
BofAS
aric.li@bofa.com

Anya Shelekhin

Research Analyst
BofAS
anya.shelekhin@bofa.com

Ryan Greenwald

Research Analyst
BofAS
ryan.greenwald@bofa.com

Dariusz Lozny, CFA

Research Analyst
BofAS
dariusz.lozny@bofa.com

Stock Data

Price	82.00 USD
Price Objective	85.00 USD
Date Established	9-Sep-2020
Investment Opinion	B-1-7
52-Week Range	62.13 USD - 103.79 USD
Mkt Val (mn) / Shares Out (mn)	60,305 USD / 735.4
Average Daily Value (mn)	267.67 USD
BofA Ticker / Exchange	DUK / NYS
Bloomberg / Reuters	DUK US / DUK.N
ROE (2020E)	7.7%
Net Dbt to Eqty (Dec-2019A)	129.8%

DEC – Duke Energy Carolinas

DEP – Duke Energy Progress

IRP – Integrated Resource Plan

iQprofileSM Duke Energy

iQmethodSM – Bus Performance*

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Return on Capital Employed	3.3%	3.9%	3.9%	3.9%	4.0%
Return on Equity	6.2%	8.2%	7.7%	7.5%	7.6%
Operating Margin	19.1%	22.8%	23.1%	23.3%	23.9%
Free Cash Flow	(2,203)	(2,003)	(1,435)	(887)	(1,730)

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Cash Realization Ratio	2.7x	2.7x	2.5x	2.5x	2.4x
Asset Replacement Ratio	2.0x	2.6x	2.2x	2.1x	2.1x
Tax Rate	14.6%	12.7%	12.2%	12.2%	12.1%
Net Debt-to-Equity Ratio	130.8%	129.8%	120.1%	120.8%	124.1%
Interest Cover	2.5x	2.9x	3.0x	3.0x	3.0x

Income Statement Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Sales	24,521	25,079	26,388	27,238	28,144
% Change	4.1%	2.3%	5.2%	3.2%	3.3%
Gross Profit	10,441	11,556	12,305	12,909	13,659
% Change	-3.5%	10.7%	6.5%	4.9%	5.8%
EBITDA	8,848	10,261	10,977	11,564	12,298
% Change	-4.7%	16.0%	7.0%	5.3%	6.3%
Net Interest & Other Income	(2,094)	(2,204)	(2,176)	(2,248)	(2,371)
Net Income (Adjusted)	2,666	3,707	3,764	3,948	4,164
% Change	-12.8%	39.0%	1.5%	4.9%	5.5%

Free Cash Flow Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Net Income from Cont Operations (GAAP)	2,647	3,755	3,767	3,950	4,166
Depreciation & Amortization	4,696	4,548	4,876	5,212	5,581
Change in Working Capital	0	(53)	(97)	(68)	(78)
Deferred Taxation Charge	1,079	1,260	1,100	1,000	400
Other Adjustments, Net	(1,236)	319	(110)	(141)	83
Capital Expenditure	(9,389)	(11,832)	(10,971)	(10,840)	(11,882)
Free Cash Flow	-2,203	-2,003	-1,435	-887	-1,730
% Change	-55.4%	9.1%	28.4%	38.2%	-95.1%

Balance Sheet Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Cash & Equivalents	591	590	675	760	547
Trade Receivables	3,134	3,183	3,299	3,375	3,455
Other Current Assets	5,989	5,958	6,100	6,153	6,171
Property, Plant & Equipment	91,694	98,650	104,745	110,373	116,674
Other Non-Current Assets	43,984	43,984	43,984	43,984	43,984
Total Assets	145,392	152,366	158,804	164,644	170,831
Short-Term Debt	6,816	7,167	7,343	7,746	7,784
Other Current Liabilities	8,225	8,190	8,351	8,411	8,431
Long-Term Debt	51,123	53,776	55,094	58,121	62,161
Other Non-Current Liabilities	35,394	35,761	35,632	35,493	35,578
Total Liabilities	101,558	104,894	106,419	109,770	113,954
Total Equity	43,834	46,498	51,411	53,900	55,903
Total Equity & Liabilities	145,392	151,392	157,830	163,670	169,857

* For full definitions of iQmethodSM measures, see page 7.

Company Sector

Electric Utilities

Company Description

Duke Energy Corporation operates as a regulated utility company in the US based in Charlotte, NC. The company operates regulated electric utilities in the Midwest, Florida and the Carolinas and supplies electric service to approximately 7.5 million residential, commercial, and industrial customers. Duke owns 50,000MW of capacity. The regulated gas utilities serve more than 1.6 million customers in the Carolinas and Ohio. A commercial arm owns contract renewables and pipelines across the US.

Investment Rationale

We rate DUK Buy as we see LT growth as intact despite years of negative revisions, by contrast, we see likely de-risking of regulatory compact into '21 legislative session alongside improving capex budget from accelerated coal retirements (beyond base plan presented) as enabling one of few positive inflections in EPS estimates in recent years. Opportunity to re-rate off exceptionally low expectations vs peers.

Stock Data

Average Daily Volume 3,264,329

Quarterly Earnings Estimates

	2019	2020
Q1	1.24A	1.14A
Q2	1.12A	1.08A
Q3	1.79A	1.83E
Q4	0.93A	1.02E



More on regulatory reform from above...

Also, we see substantially greater traction for meaningful regulatory reform/ carbon legislation and aggressive adoption of renewables capex post-election (particularly the NC House of Reps, which republicans currently have majority). The Senate race (much tighter) too will be important given their more conservative stance on energy legislation in the past. '21 looks set to see an improved backdrop for DUK considering the various potential outcomes of 'another' shot at legislation this time, with what seems like meaningfully improved stakeholder support. Prospects such as MYRPs (to avoid consecutive cases), ROE banding, & PBRs all appear quite possible.

Clarifying earned ROEs in the Carolinas: Lag embedded

Following our upgrade of DUK to Buy, we further clarify our earned ROE assumptions for the Carolinas. Our base case assumes Duke's pending coal ash outcome is in line with Dominion's precedent order (10yr amortization absent a return), which we already reflect in our EPS estimates w/ 20-30bps of lag ('23 and beyond) as we expect Duke will offset most of the coal ash lag next year and into '22 with cost mitigation. This translates to ~5-9c of drag per year vs mgmt. estimates of 5-10c/yr. Hence, our earned ROEs for DEC for '21 / '22 / '23 / '24 are 9.6% / 9.5% / 9.4% / 9.3% and for DEP of 9.6% / 9.6% / 9.5% / 9.4%, respectively (see full table for all electric utility earned ROEs inside).

The base case embedded in our model currently assumes Duke's pending coal ash outcome is in line with Dominion's precedent order as we reflect 20-30bps of lag in the out years ('23 and beyond). The coal ash lag does not occur until 2023 because we expect Duke will offset most of this lag next year and into '22 with cost mitigation. This expected coal ash lag translates to ~5-9c of drag per year vs mgmt. estimates of 5-10c/yr. Hence, our earned ROEs for Duke Energy Carolinas for '21 / '22 / '23 / '24 are 9.6% / 9.5% / 9.4% / 9.3% and for Duke Energy Progress of 9.6% / 9.6% / 9.5% / 9.4%, clearly exhibiting lag from coal ash in '23/24/25, and compare to the authorized ROEs of 9.5% and 9.6% in SC and NC, respectively.

Table 1: Duke Carolinas Earned ROE assumptions – clearly incorporates lag of w/ 5-9c of drag assumed

Duke Carolinas Earned ROE assumptions	2019A	2020E	2021E	2022E	2023E	2024E	2025E
Duke Energy Carolinas (NC+SC) Reported Book ROE	10.50%	9.5-10%	9.5-10%	9.5-10%	9.5-10%	9.5-10%	9.5-10%
Weighted (NC+SC) Regulatory ROE	9.90%	9.85%	9.57%	9.57%	9.57%	9.57%	9.57%
Adjusted Book ROE	10.50%	9.73%	9.58%	9.51%	9.44%	9.37%	9.32%
Coal Ash Headwind (regulatory Lag)			0.0%	0.1%	0.1%	0.2%	0.3%
Coal Ash EPS Drag			-	0.01	0.03	0.05	0.06
Duke Energy Progress Reported Book ROE	10.50%	9.5-10%	9.5-10%	9.5-10%	9.5-10%	9.5-10%	9.5-10%
Ratebase-Weighted Authorized ROE (NC+SC)	9.94%	9.82%	9.58%	9.58%	9.58%	9.58%	9.58%
Adjusted Book ROE	9.52%	9.63%	9.60%	9.57%	9.47%	9.40%	9.43%
Book ROE Delta	-0.98%	0.12%	0.15%	0.18%	0.28%	0.35%	0.32%
Coal Ash Headwind (regulatory Lag)	0.00%	0.00%	0.0%	0.0%	0.1%	0.2%	0.2%
Coal Ash EPS Drag			-	0.00	0.02	0.03	0.02
Total EPS Impact from Coal Ash (order similar to Dominion assumed)			-	0.02	0.05	0.07	0.09

Source: BofA Global Research estimates, company report



DUK EPS estimates

Table 2: DUK EPS estimates

DUK Model - Dashboard/Overview

EPS Estimates	2019A	2020E	2021E	2022E	2023E	2024E	2025E
Electric							
Carolinas	1.95	1.88	1.87	1.93	2.00	2.08	2.16
Indiana	0.60	0.60	0.62	0.65	0.67	0.70	0.74
Ohio - Electric	0.22	0.25	0.26	0.28	0.31	0.34	0.39
Progress- Carolinas	1.12	1.15	1.13	1.15	1.16	1.18	1.20
Progress- Florida	0.96	1.01	1.05	1.10	1.13	1.16	1.20
Commercial Transmission	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eliminations	-0.04	0.00	0.00	0.00	0.00	0.00	0.00
Consolidated Earnings	4.81	4.89	4.94	5.11	5.27	5.46	5.70
Guidance	4.77	4.94					
Gas							
Ohio - Gas	0.12	0.13	0.16	0.19	0.21	0.23	0.25
Piedmont (PNY)	0.27	0.31	0.33	0.37	0.41	0.45	0.49
Midstream Pipelines	0.24	0.11	0.04	0.05	0.06	0.08	0.09
Eliminations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consolidated Earnings	0.62	0.55	0.53	0.61	0.68	0.75	0.83
Guidance	0.51	0.72					
Commercial Renewables	0.27	0.32	0.33	0.30	0.28	0.29	0.28
Guidance	0.32	0.33					
Parent/Other	-0.64	-0.69	-0.60	-0.57	-0.50	-0.46	-0.46
Guidance	-0.60	-0.73					
Adjustments							
BofAe EPS	5.07	5.07	5.20	5.44	5.72	6.04	6.39
<i>Previous Estimates</i>	5.06	5.07	5.20	5.44	5.72	6.04	6.39
Guidance	4.95-5.15	5.05-5.45					
Consensus	5.02	5.08	5.24	5.49	5.84	6.20	7.04
Mgmt EPS CAGR: 4-6% from 2019-2024E (OLD)	5.00	5.25	5.51	5.79	6.08	6.39	
Low End	4.80	5.05	5.41	5.62	5.85	6.08	
High End	5.20	5.45	5.62	5.96	6.31	6.69	
BofAe CAGR '19-'24e						3.9%	
Mgmt EPS CAGR: 4-6% off '21 expected \$5.15 base (NEW)			5.15	5.41	5.68	5.96	6.26
Low End				5.36	5.57	5.79	6.02
High End				5.46	5.79	6.13	6.50
BofAe CAGR '21-'25e							5.6%

Source: BofA Global Research estimates, company report, Bloomberg



Price objective basis & risk

Duke Energy (DUK)

Our \$85 PO is derived from a sum-of-the-parts valuation. We value the Electric and Gas utilities using peer 2022E P/E multiples. We apply a 2.0x multiple premium to Duke's operations in FL/IN to reflect more favorable regulatory environments. We apply a 0.5x multiple to the Carolinas given upside to spending in improving regulatory construct combined with latest IRP. We value the other regulated electric utilities at 16.5x and the gas utilities at peer group multiples of 14.5x 2022E P/E, respectively. Both electric and gas peer P/E multiples are grossed up by 5% for the groups CAGR to reflect capital appreciation across the sector. The commercial midstream, and transmission are valued on a 2022E EV/EBITDA basis. We use a 9.0x multiple for midstream and transmission segment. We add the net present value of renewable segment using an 8% discount rate. We subtract out the impact of commercial debt, and add back for the renewable debt.

Upside risks: constructive rate case results, higher capital expenditure additions vs our assumptions, lower interest rates. Downside risks: poor rate case results, operating errors, and negative changes in the regulatory environment, Macro risks: Increases in interest rates and decreases in equity market valuations.

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North American Utilities, Alternative Energy & LNG Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
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	Alliant Energy Corporation	LNT	LNT US	Julien Dumoulin-Smith
	AltaGas	YALA	ALA CN	Julien Dumoulin-Smith
	Atlantica Yield	AY	AY US	Julien Dumoulin-Smith
	Atmos Energy Corporation	ATO	ATO US	Richard Ciciarelli, CFA
	Avista	AVA	AVA US	Richard Ciciarelli, CFA
	Clearway Energy	CWENA	CWEN/A US	Julien Dumoulin-Smith
	Clearway Energy	CWEN	CWEN US	Julien Dumoulin-Smith
	CMS Energy	CMS	CMS US	Julien Dumoulin-Smith
	Consolidated Edison	ED	ED US	Julien Dumoulin-Smith
	DTE Energy	DTE	DTE US	Julien Dumoulin-Smith
	Duke Energy	DUK	DUK US	Julien Dumoulin-Smith
	Edison International	EIX	EIX US	Julien Dumoulin-Smith
	Emera Inc	YEMA	EMA CN	Julien Dumoulin-Smith
	Entergy	ETR	ETR US	Julien Dumoulin-Smith
	Essential Utilities	WTRG	WTRG US	Julien Dumoulin-Smith
	Evergy, Inc	EVRG	EVRG US	Julien Dumoulin-Smith
	First Solar, Inc.	FSLR	FSLR US	Julien Dumoulin-Smith
	FirstEnergy	FE	FE US	Julien Dumoulin-Smith
	Idacorp	IDA	IDA US	Julien Dumoulin-Smith
	NextEra Energy	NEE	NEE US	Julien Dumoulin-Smith
	NRG Energy	NRG	NRG US	Julien Dumoulin-Smith
	OGE Energy Corp	OGE	OGE US	Julien Dumoulin-Smith
	PG&E Corporation	PCG	PCG US	Julien Dumoulin-Smith
	PNM Resources Inc.	PNM	PNM US	Julien Dumoulin-Smith
	PPL Corporation	PPL	PPL US	Julien Dumoulin-Smith
	Sempra Energy	SRE	SRE US	Julien Dumoulin-Smith
	Spire	SR	SR US	Richard Ciciarelli, CFA
	Sunnova Energy	NOVA	NOVA US	Julien Dumoulin-Smith
	SunRun	RUN	RUN US	Julien Dumoulin-Smith
	Vistra Energy	VST	VST US	Julien Dumoulin-Smith
NEUTRAL				
	Ameren Corporation	AEE	AEE US	Julien Dumoulin-Smith
	American Electric Power	AEP	AEP US	Julien Dumoulin-Smith
	Avangrid	AGR	AGR US	Julien Dumoulin-Smith
	Black Hills Corporation	BKH	BKH US	Julien Dumoulin-Smith
	CenterPoint Energy	CNP	CNP US	Julien Dumoulin-Smith
	Cheniere Energy Inc	LNG	LNG US	Julien Dumoulin-Smith
	Dominion Energy	D	D US	Julien Dumoulin-Smith
	Hannon Armstrong	HASI	HASI US	Julien Dumoulin-Smith
	Hydro One	YH	H CN	Julien Dumoulin-Smith
	NextDecade	NEXT	NEXT US	Julien Dumoulin-Smith
	NextEra Energy Partners	NEP	NEP US	Julien Dumoulin-Smith
	NiSource Inc	NI	NI US	Julien Dumoulin-Smith
	ONE Gas, Inc.	OGS	OGS US	Richard Ciciarelli, CFA
	Pinnacle West	PNW	PNW US	Julien Dumoulin-Smith
	Portland General Electric Company	POR	POR US	Julien Dumoulin-Smith
	Public Service Enterprise Group	PEG	PEG US	Julien Dumoulin-Smith
	Southern Company	SO	SO US	Julien Dumoulin-Smith
	Southwest Gas Holdings	SWX	SWX US	Richard Ciciarelli, CFA
	Tellurian Inc	TELL	TELL US	Julien Dumoulin-Smith
	Xcel Energy Inc	XEL	XEL US	Julien Dumoulin-Smith
UNDERPERFORM				
	Algonquin Power & Utilities Corp	AQN	AQN US	Julien Dumoulin-Smith
	Algonquin Power & Utilities Corp	YAQN	AQN CN	Julien Dumoulin-Smith
	American Water Works	AWK	AWK US	Julien Dumoulin-Smith
	Bloom Energy	BE	BE US	Julien Dumoulin-Smith
	Eversource Energy	ES	ES US	Julien Dumoulin-Smith
	Exelon	EXC	EXC US	Julien Dumoulin-Smith
	Fortis	YFTS	FTS CN	Julien Dumoulin-Smith
	Fortis Inc	FTS	FTS US	Julien Dumoulin-Smith
	Hawaiian Electric Industries	HE	HE US	Julien Dumoulin-Smith
	MGE Energy	MGEE	MGEE US	Julien Dumoulin-Smith
	New Jersey Resources Corp	NJR	NJR US	Richard Ciciarelli, CFA



North American Utilities, Alternative Energy & LNG Coverage Cluster

Investment rating	Company	BoFA Ticker	Bloomberg symbol	Analyst
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	NorthWestern Corporation	NWE	NWE US	Julien Dumoulin-Smith
	South Jersey Industries	SJI	SJI US	Richard Ciciarelli, CFA
	SunPower Corp.	SPWR	SPWR US	Julien Dumoulin-Smith
	Unitil Corporation	UTL	UTL US	Julien Dumoulin-Smith
	WEC Energy Group Inc	WEC	WEC US	Julien Dumoulin-Smith
RSTR				
	Vivint Solar	VSLR	VSLR US	Julien Dumoulin-Smith

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Business Performance	Numerator	Denominator
Return On Capital Employed	NOPAT = (EBIT + Interest Income) * (1 - Tax Rate) + Goodwill Amortization	Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill Amortization
Return On Equity	Net Income	Shareholders' Equity
Operating Margin	Operating Profit	Sales
Earnings Growth	Expected 5-Year CAGR From Latest Actual	N/A
Free Cash Flow	Cash Flow From Operations – Total Capex	N/A
Quality of Earnings		
Cash Realization Ratio	Cash Flow From Operations	Net Income
Asset Replacement Ratio	Capex	Depreciation
Tax Rate	Tax Charge	Pre-Tax Income
Net Debt-To-Equity Ratio	Net Debt = Total Debt, Less Cash & Equivalents	Total Equity
Interest Cover	EBIT	Interest Expense
Valuation Toolkit		
Price / Earnings Ratio	Current Share Price	Diluted Earnings Per Share (Basis As Specified)
Price / Book Value	Current Share Price	Shareholders' Equity / Current Basic Shares
Dividend Yield	Annualised Declared Cash Dividend	Current Share Price
Free Cash Flow Yield	Cash Flow From Operations – Total Capex	Market Cap. = Current Share Price * Current Basic Shares
Enterprise Value / Sales	EV = Current Share Price * Current Shares + Minority Equity + Net Debt + Other LT Liabilities	Sales
EV / EBITDA	Enterprise Value	Basic EBIT + Depreciation + Amortization

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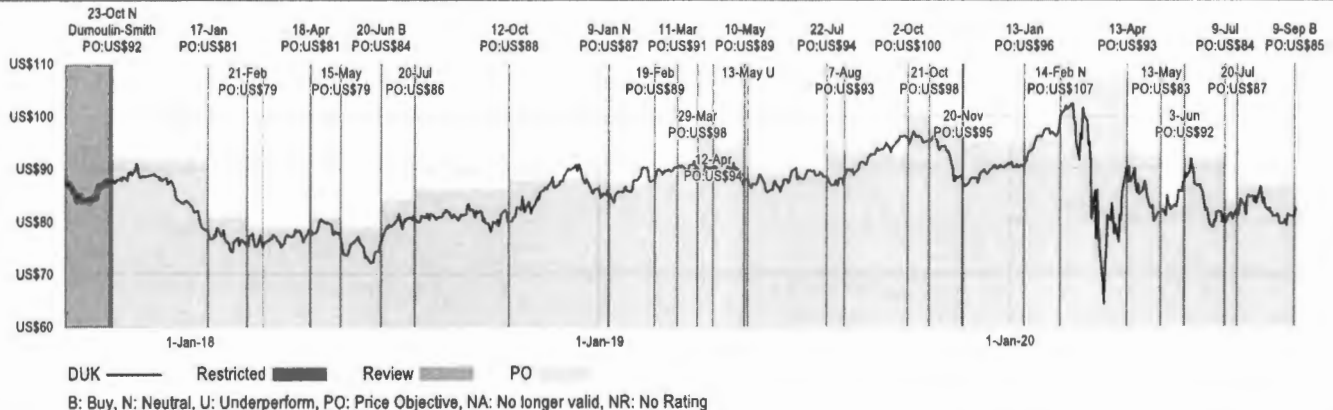
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Duke Energy (DUK) Price Chart



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Equity Investment Rating Distribution: Utilities Group (as of 30 Jun 2020)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	76	51.01%	Buy	56	73.68%
Hold	33	22.15%	Hold	22	66.67%
Sell	40	26.85%	Sell	29	72.50%

Equity Investment Rating Distribution: Global Group (as of 30 Jun 2020)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
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Hold	711	22.74%	Hold	444	62.45%
Sell	783	25.05%	Sell	407	51.98%

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I/A

Public Staff 96

Docket No. E-2, Sub 1219

Rebuttal Exhibit RBH-15

Page 1 of 2

Credit Ratings - Dr. Woolridge's Proxy Group

Company	Ticker	Moody's Long-Term Issuer	Moody's Corporate Long-Term	S&P Long-Term Issuer	S&P Corporate Long-Term
ALLETE, Inc.	ALE	Baa1	Baa1	BBB+	BBB+
Superior Water, Light and Power Company		A3			
Alliant Energy Corporation	LNT	Baa2	Baa2	A-	A-
Interstate Power and Light Company		Baa1	Baa1	A-	A-
Wisconsin Power and Light Company		A3	A3	A	A
Ameren Corporation	AEE	Baa1	Baa1	BBB+	BBB+
Ameren Illinois Company		A3	A3	BBB+	BBB+
Union Electric Company		Baa1	Baa1	BBB+	BBB+
American Electric Power Company, Inc.	AEP		Baa1	A-	A-
AEP Texas Inc.		Baa1	Baa1	A-	A-
Appalachian Power Company		Baa1	Baa1	A-	A-
Indiana Michigan Power Company		A3	A3	A-	A-
Kentucky Power Company		Baa3	Baa3	A-	A-
Ohio Power Company		A2	A2	A-	A-
Public Service Company of Oklahoma		A3	A3	A-	A-
Southwestern Electric Power Company		Baa2	Baa2	A-	A-
Avangrid, Inc.	AGR	Baa1	Baa1	BBB+	BBB+
New York State Electric & Gas Corporation		A3	A3	A-	A-
United Illuminating Company		Baa1	Baa1	A-	A-
Rochester Gas and Electric Corporation		A3	A3	A-	A-
Central Maine Power Company		A2	A2	A	A
Avista Corporation	AVA	Baa2		BBB	
Alaska Electric Light and Power		Baa3	Baa3		
CMS Energy Corporation	CMS		Baa1	BBB+	BBB+
Consumers Energy Company			(P)A2	A-	A-
Consolidated Edison, Inc.	ED	Baa2	Baa2	A-	A-
Consolidated Edison Company of New York, Inc.		Baa1	Baa1	A-	A-
Orange and Rockland Utilities, Inc.		Baa1	Baa1	A-	A-
Rockland Electric				A-	A-
Dominion Energy, Inc.	D		Baa2	BBB+	BBB+
Dominion Energy South Carolina, Inc.		Baa2	Baa2	BBB+	BBB+
Virginia Electric and Power Company		A2	A2	BBB+	BBB+
Duke Energy Corporation	DUK	Baa1	Baa1	A-	A-
Duke Energy Carolinas, LLC		A1	A1	A-	A-
Duke Energy Florida, LLC		A3	A3	A-	A-
Duke Energy Indiana, LLC		A2	A2	A-	A-
Duke Energy Kentucky, Inc.			Baa1	A-	A-
Duke Energy Ohio, Inc.		Baa1	Baa1	A-	A-
Duke Energy Progress, LLC		A2	A2	A-	A-
Edison International	EIX	Baa3	Baa3	BBB	BBB
Southern California Edison Company		Baa2	Baa2	BBB	BBB
Entergy Corporation	ETR	Baa2	Baa2	BBB+	BBB+
Entergy Arkansas, LLC		Baa1	Baa1	A-	A-
Entergy Louisiana, LLC		Baa1	Baa1	A-	A-
Entergy Mississippi, LLC		Baa1	Baa1	A-	A-
Entergy New Orleans, LLC		Ba1	Ba1	BBB+	BBB+
Entergy Texas, Inc.		Baa3	Baa3	BBB+	BBB+
Eversource Energy	ES	Baa1	Baa1	A-	A-
Connecticut Light and Power Company		A3	A3	A	A
NSTAR Electric Company		A1	A1	A	A
Public Service Company of New Hampshire		A3	A3	A	A

DEC Moody's A1 - Total of Five - A1

DEP Moody's A2 - Total of 11 - A2

Remaining 62 A3 or lower

Credit Ratings - Dr. Woolridge's Proxy Group

Company	Ticker	Moody's Long-Term Issuer	Moody's Corporate Long-Term	S&P Long-Term Issuer	S&P Corporate Long-Term
Exelon Corporation	EXC	Baa2	Baa2	BBB+	BBB+
Atlantic City Electric Company		Baa1	Baa1	A-	A-
Baltimore Gas and Electric Company		A3	A3	A	A
Commonwealth Edison Company		A3	A3	A-	A-
Delmarva Power & Light Company		Baa1	Baa1	A-	A-
PECO Energy Co.		A2	A2	BBB+	BBB+
Potomac Electric Power Company		Baa1	Baa1	A-	A-
FirstEnergy Corp.	FE	Baa3	Baa3	BBB	BBB
Cleveland Electric Illuminating Company		Baa2	Baa2	BBB	BBB
Jersey Central Power & Light Company		Baa1	Baa1	BBB	BBB
Metropolitan Edison Company		A3	A3	BBB	BBB
Monongahela Power Company		Baa2	Baa2	BBB	BBB
Ohio Edison Company		A3	A3	BBB	BBB
Pennsylvania Electric Company		Baa1	Baa1	BBB	BBB
Pennsylvania Power Company		A3	A3	BBB	BBB
Potomac Edison Company		Baa2	Baa2	BBB	BBB
Toledo Edison Company		Baa1	Baa1	BBB	BBB
West Penn Power Company		A3	A3	BBB	BBB
Hawaiian Electric Industries, Inc.	HE			BBB-	BBB-
Hawaiian Electric Company, Inc.		Baa2	Baa2	BBB-	BBB-
Hawaii Electric Light Company				BBB-	BBB-
Maui Electric Company, Ltd				BBB-	BBB-
IDACORP, Inc.	IDA	Baa1	Baa1	BBB	BBB
Idaho Power Company		A3	A3	BBB	BBB
MGE Energy, Inc.	MGEE				
Madison Gas and Electric Company		A1	A1	AA-	AA-
NextEra Energy, Inc.	NEE	Baa1	Baa1	A-	A-
Florida Power & Light Company		A1	A1	A	A
Gulf Power Company		A2	A2	A	A
NorthWestern Corporation	NWE		Baa2	BBB	BBB
OGE Energy Corp.	OGE		(P)Baa1	BBB+	BBB+
Oklahoma Gas and Electric Company		A3	A3	A-	A-
Otter Tail Corporation	OTTR	Baa2	Baa2	BBB	BBB
Otter Tail Power Company		A3	A3	BBB+	BBB+
Pinnacle West Capital Corporation	PNW	A3	A3	A-	A-
Arizona Public Service Company		A2	A2	A-	A-
PNM Resources, Inc.	PNM	Baa3	Baa3	BBB	BBB
Public Service Company of New Mexico		Baa2	Baa2	BBB	BBB
Texas-New Mexico Power Company		A3	A3	BBB+	BBB+
Portland General Electric Company	POR	A3	A3	BBB+	BBB+
PPL Corporation	PPL	Baa2	Baa2	A-	A-
Kentucky Utilities Company		A3	A3	A-	A-
LG&E and KU Energy LLC		Baa1	Baa1	A-	A-
Louisville Gas and Electric Company		A3	A3	A-	A-
PPL Electric Utilities Corporation		A3	A3	A-	A-
Sempra Energy	SRE	Baa1	Baa1	BBB+	BBB+
Oncor Electric Delivery Company LLC			A2	A	A
San Diego Gas & Electric Company		Baa1	Baa1	BBB+	BBB+
Southern Company	SO		Baa2	A-	A-
Alabama Power Company		A1	A1	A	A
Georgia Power Company		Baa1	Baa1	A-	A-
Mississippi Power Company		Baa2	Baa2	A-	A-
WEC Energy Group, Inc.	WEC	Baa1	Baa1	A-	A-
Wisconsin Electric Power Company		A2	A2	A-	A-
Wisconsin Public Service Corporation		A2	A2	A-	A-
Xcel Energy Inc.	XEL	Baa1	Baa1	A-	A-
Northern States Power Company - MN		A2	A2	A-	A-
Northern States Power Company - WI			(P)A2	A-	A-
Public Service Company of Colorado		A3	A3	A-	A-
Southwestern Public Service Company		Baa2	Baa2	A-	A-

Source: S&P Global Market Intelligence

Duke Energy Progress
DOCKET NO. E-2, SUB 1219

PUBLIC STAFF EXHIBIT

STOCK PRICE CLOSE

	<u>Duke Energy Corporation</u>	<u>S&P 500 Index</u>
February 21, 2020	\$101.43	3,338
February 24 ¹	102.30	3,226
February 25	99.25	3,128
February 26	98.94	3,116
February 27	94.99	2,979
February 28	91.70	2,954
March 2	96.67	3,090
March 3	95.61	3,003
March 4	101.65	3,130
March 5	100.13	3,024
March 6	99.05	2,972
March 9	94.58	2,747
March 10	95.05	2,882
March 11	90.94	2,741
March 12	80.48	2,481
March 13	85.75	2,711
March 16	76.58	2,386
March 17	86.00	2,529
March 18	79.28	2,398
March 19	75.05	2,409
March 20	68.40	2,305

¹ Issuance of Commission February 24, 2020 Dominion Energy North Carolina order in Docket No. E-22, Sub 562.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d) of the
Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): **September 9, 2020**

Commission file number	Registrant, State of Incorporation or Organization, Address of Principal Executive Offices, and Telephone Number	IRS Employer Identification No.
1-32853	 DUKE ENERGY CORPORATION (a Delaware corporation) 550 South Tryon Street Charlotte, North Carolina 28202-1803 704-382-3853	20-2777218

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- ☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- ☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- ☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- ☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock, \$0.001 par value	DUK	New York Stock Exchange LLC
5.125% Junior Subordinated Debentures due January 15, 2073	DUKH	New York Stock Exchange LLC
5.625% Junior Subordinated Debentures due September 15, 2078	DUKB	New York Stock Exchange LLC
Depository Shares, each representing a 1/1,000 th interest in a share of 5.75% Series A Cumulative Redeemable Perpetual Preferred Stock, par value \$0.001 per share	DUK PR A	New York Stock Exchange LLC

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Item 7.01. Regulation FD Disclosure.

On September 9, 2020, Duke Energy Corporation posted an investor presentation to its website at www.duke-energy.com/our-company/investors. A copy of these slides is attached hereto as Exhibit 99.1. The information in Exhibit 99.1 is being furnished pursuant to this Item 7.01. In accordance with General Instruction B.2 of Form 8-K, the information in Item 7.01 of this Current Report on Form 8-K, including Exhibit 99.1, shall not be deemed "filed" for the purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liabilities of that section.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

99.1 September 2020 Investor Update of Duke Energy Corporation dated September 9, 2020 (furnished pursuant to Item 7.01)

104 Cover Page Interactive Data File (embedded within the Inline XBRL document).

I/A

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

DUKE ENERGY CORPORATION

Date: September 9, 2020

By: /s/ David S. Maltz

Name: David S. Maltz

Title: Vice President, Legal, Chief Governance Officer and Assistant Corporate Secretary

I/A



Safe Harbor statement

This presentation includes forward-looking statements within the meaning of the federal securities laws. Actual results could differ materially from such forward-looking statements. The factors that could cause actual results to differ are discussed herein and in Duke Energy's SEC filings, available at www.sec.gov.

Regulation G disclosure

In addition, today's discussion includes certain non-GAAP financial measures as defined under SEC Regulation G. A reconciliation of those measures to the most directly comparable GAAP measures is available in the Appendix herein and on our Investor Relations website at www.duke-energy.com/investors/.

Safe harbor statement

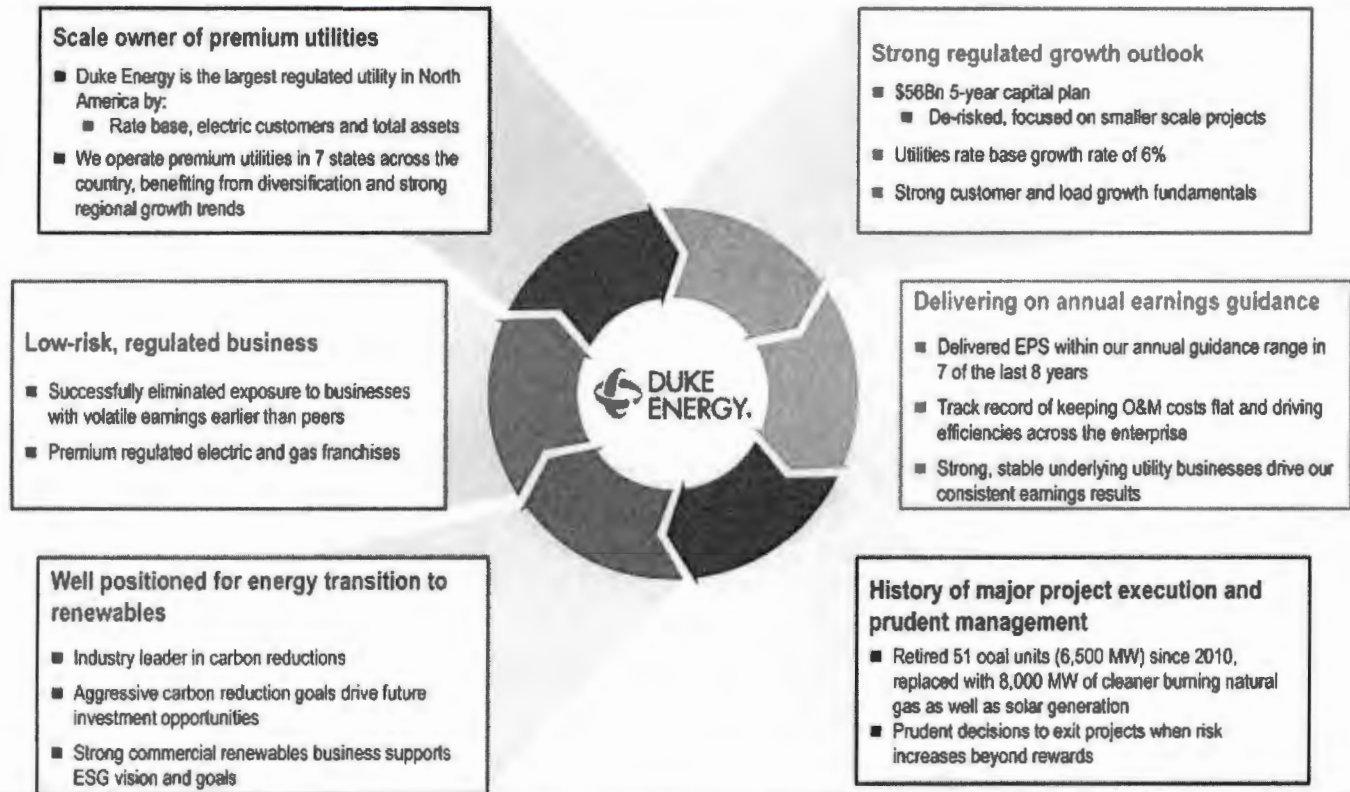
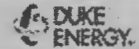


This document includes forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. Forward-looking statements are based on management's beliefs and assumptions and can often be identified by terms and phrases that include "anticipate," "believe," "intend," "estimate," "expect," "continue," "should," "could," "may," "plan," "project," "predict," "will," "potential," "forecast," "target," "guidance," "outlook" or other similar terminology. Various factors may cause actual results to be materially different than the suggested outcomes within forward-looking statements; accordingly, there is no assurance that such results will be realized. These factors include, but are not limited to: The impact of the COVID-19 pandemic; State, federal and foreign legislative and regulatory initiatives, including costs of compliance with existing and future environmental requirements, including those related to climate change, as well as rulings that affect cost and investment recovery or have an impact on rate structures or market prices; The extent and timing of costs and liabilities to comply with federal and state laws, regulations and legal requirements related to coal ash remediation, including amounts for required closure of certain ash impoundments, are uncertain and difficult to estimate; The ability to recover eligible costs, including amounts associated with coal ash impoundment retirement obligations and costs related to significant weather events, and to earn an adequate return on investment through rate case proceedings and the regulatory process; The costs of decommissioning nuclear facilities could prove to be more extensive than amounts estimated and all costs may not be fully recoverable through the regulatory process; Costs and effects of legal and administrative proceedings, settlements, investigations and claims; Industrial, commercial and residential growth or decline in service territories or customer bases resulting from sustained downturns of the economy and the economic health of our service territories or variations in customer usage patterns, including energy efficiency efforts and use of alternative energy sources, such as self-generation and distributed generation technologies; Federal and state regulations, laws and other efforts designed to promote and expand the use of energy efficiency measures and distributed generation technologies, such as private solar and battery storage, in Duke Energy service territories could result in customers leaving the electric distribution system, excess generation resources as well as stranded costs; Advancements in technology; Additional competition in electric and natural gas markets and continued industry consolidation; The influence of weather and other natural phenomena on operations, including the economic, operational and other effects of severe storms, hurricanes, droughts, earthquakes and tornadoes, including extreme weather associated with climate change; The ability to successfully operate electric generating facilities and deliver electricity to customers including direct or indirect effects to the company resulting from an incident that affects the U.S. electric grid or generating resources; The ability to obtain the necessary permits and approvals and to complete necessary or desirable pipeline expansion or infrastructure projects in our natural gas business; Operational interruptions to our natural gas distribution and transmission activities; The availability of adequate interstate pipeline transportation capacity and natural gas supply; The impact on facilities and business from a terrorist attack, cybersecurity threats, data security breaches, operational accidents, information technology failures or other catastrophic events, such as fires, explosions, pandemic health events or other similar occurrences. The inherent risks associated with the operation of nuclear facilities, including environmental, health, safety, regulatory and financial risks, including the financial stability of third-party service providers; The timing and extent of changes in commodity prices and interest rates and the ability to recover such costs through the regulatory process, where appropriate, and their impact on liquidity positions and the value of underlying assets; The results of financing efforts, including the ability to obtain financing on favorable terms, which can be affected by various factors, including credit ratings, interest rate fluctuations, compliance with debt covenants and conditions and general market and economic conditions; Credit ratings of the Duke Energy Registrants may be different from what is expected; Declines in the market prices of equity and fixed-income securities and resultant cash funding requirements for defined benefit pension plans, other post-retirement benefit plans and nuclear decommissioning trust funds; Construction and development risks associated with the completion of the Duke Energy Registrants' capital investment projects, including risks related to financing, obtaining and complying with terms of permits, meeting construction budgets and schedules and satisfying operating and environmental performance standards, as well as the ability to recover costs from customers in a timely manner, or at all; Changes in rules for regional transmission organizations, including changes in rate designs and new and evolving capacity markets, and risks related to obligations created by the default of other participants; The ability to control operation and maintenance costs; The level of creditworthiness of counterparties to transactions; The ability to obtain adequate insurance at acceptable costs; Employee workforce factors, including the potential inability to attract and retain key personnel; The ability of subsidiaries to pay dividends or distributions to Duke Energy Corporation holding company (the Parent); The performance of projects undertaken by our nonregulated businesses and the success of efforts to invest in and develop new opportunities; The effect of accounting pronouncements issued periodically by accounting standard-setting bodies; The impact of U.S. tax legislation to our financial condition, results of operations or cash flows and our credit ratings; The impacts from potential impairments of goodwill or equity method investment carrying values; and the ability to implement our business strategy, including enhancing existing technology systems.

Additional risks and uncertainties are identified and discussed in the Duke Energy Registrants' reports filed with the SEC and available at the SEC's website at sec.gov. In light of these risks, uncertainties and assumptions, the events described in the forward-looking statements might not occur or might occur to a different extent or at a different time than described. Forward-looking statements speak only as of the date they are made and the Duke Energy Registrants expressly disclaim an obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

I/A

Our Long-Term Investor Value Proposition



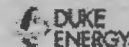


Carolinas IRP Highlights



SEPTEMBER INVESTOR UPDATE Q4/10

Duke Energy's clean energy future vision for the Carolinas



Carolinas IRPs illustrate multiple pathways to a **cleaner energy future**

Collaborated with over 200 **Stakeholders** to help shape **path to achieve** our climate goals

KEY MESSAGES

- Carolinas Integrated Resource Plans (IRP) filed Sept. 1 include six portfolios
 - **Base case has a least cost standard⁽¹⁾**, following current energy policy
 - Other portfolios present options for accelerated decarbonization, a Duke Energy priority with emerging support in the Carolinas
 - All portfolios represent **significant capital opportunities**
- Renewables take center stage in five of six pathways, while natural gas continues to play a vital role
 - **Renewables and storage additions average 16,000 MW** across the six portfolios, with gas additions averaging 6,500 MW
 - **Dispatchable resources are needed** to support significant renewables additions (recent example in California)
 - **Winter peak in the Carolinas** necessitates natural gas generation to supply power on early/dark mornings in January and February
 - Multiple **third party studies⁽¹⁾ support the role of natural gas** enabling a cost-effective transition to de-carbonization



DESTINATION
 => 50% REDUCTION IN CO₂
 EMISSIONS BY 2030 AND
NET-ZERO BY 2050

(1) See appendix slides for additional information

2030 CARBON REDUCTION IN CAROLINAS WILL RANGE FROM 56% TO 74%

Carolinas IRPs: Summary Results



Pathway	Base without Carbon Policy		Base with Carbon Policy		Earliest Practicable Coal Retirements		70% CO ₂ Reduction: High Wind		70% CO ₂ Reduction: High Small Modular Reactor (SMR)		No New Gas Generation	
	A		B		C		D		E		F	
System CO ₂ Reduction (2030 2035)	56%	53%	59%	62%	64%	64%	70%	73%	71%	74%	65%	73%
Present Value Revenue Requirement (PVRR) [\$B] (through 2050) ¹	\$79.8		\$82.5		\$84.1		\$100.5		\$95.5		\$108.1	
Estimated Transmission Investment Required [\$B] ²	\$0.9		\$1.8		\$1.3		\$7.5		\$3.1		\$8.9	
Total Solar [MW] ^{3, 4}	8,650		12,300		12,400		16,250		16,250		16,400	
Incremental Onshore Wind [MW] ³	0		750		1,350		2,850		2,850		3,150	
Incremental Offshore Wind [MW] ³	0		0		0		2,650		250		2,650	
Incremental SMR Capacity [MW] ⁴	0		0		0		0		1,350		700	
Incremental Storage [MW] ^{3, 5}	1,050		2,200		2,200		4,400		4,400		7,400	
Incremental Gas [MW] ³	9,600		7,350		9,600		6,400		6,100		0	
Total Contribution from Energy Efficiency and Demand Response Initiatives [MW] ⁶	2,050		2,050		2,050		3,350		3,350		3,350	
Dependency on Technology & Policy Advancement												

¹ PVRR includes the cost of CO₂ as tax, including CO₂ costs as forecasted through 2050, by \$11-\$16/B through 2050.

² Represents an estimated nominal transmission investment cost as included in PVRR calculation.

³ All capacities are Total/Incremental nameplate capacity within the IRP planning horizon.

⁴ Total solar nameplate capacity includes 3,925 MW connected in DEC and DEP combined as of year-end 2020 (projected).

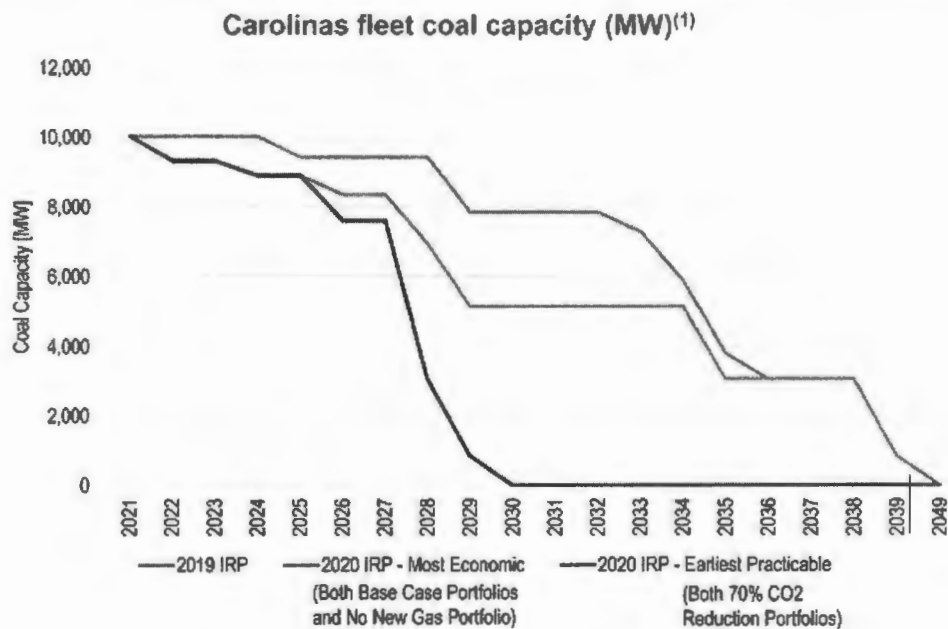
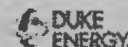
⁵ Includes 4-hr, 8-hr, and 16-hr grid-tied storage, storage at select plus storage sites, and pumped storage.

⁶ Contribution of ELDR (including Integrated Volt-Var Control (IVVC) and Distribution System Demand Response (DSDR)) in 2035 to peak winter planning hour.

LEGEND:

- Completely dependent
- Highly dependent
- Moderately dependent
- Slightly dependent
- Not dependent

Coal retirements by portfolio



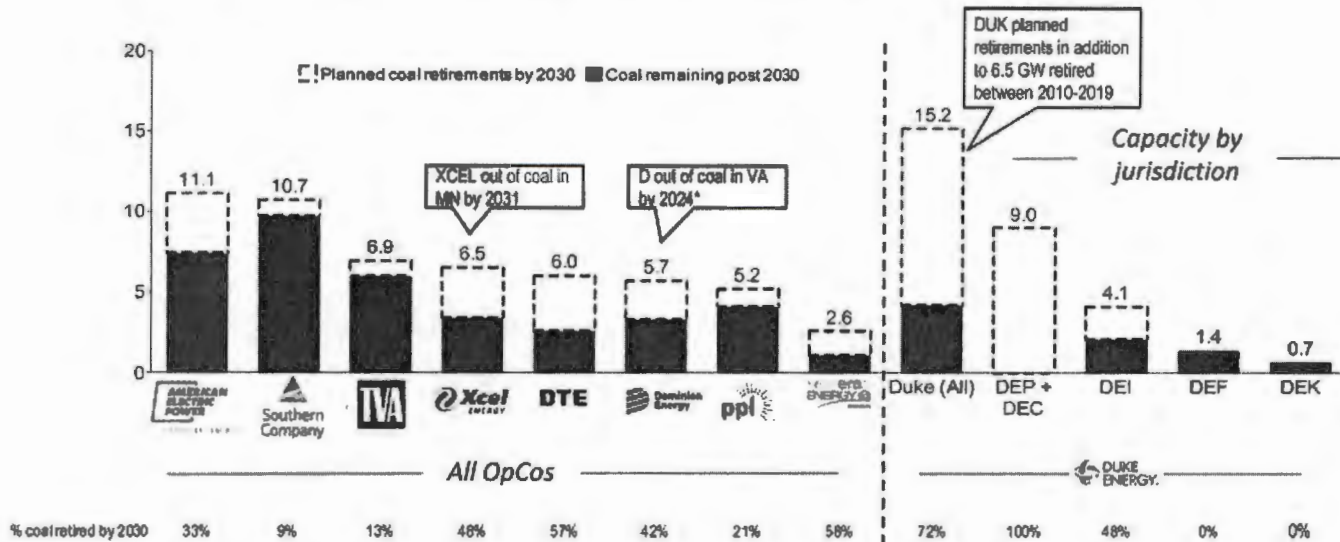
(1) In Earliest Practicable scenario, Coal fuel unit Cliffside 6 operates on natural gas only starting in 2030

2020 IRPS ACCELERATE COAL RETIREMENTS AS A BASELINE, AND PROVIDE POTENTIAL FOR SIGNIFICANT ACCELERATION

IRP contemplates the largest coal closure in the industry over the next decade



2019 active coal nameplate capacity and planned retirements by 2030 (GW)

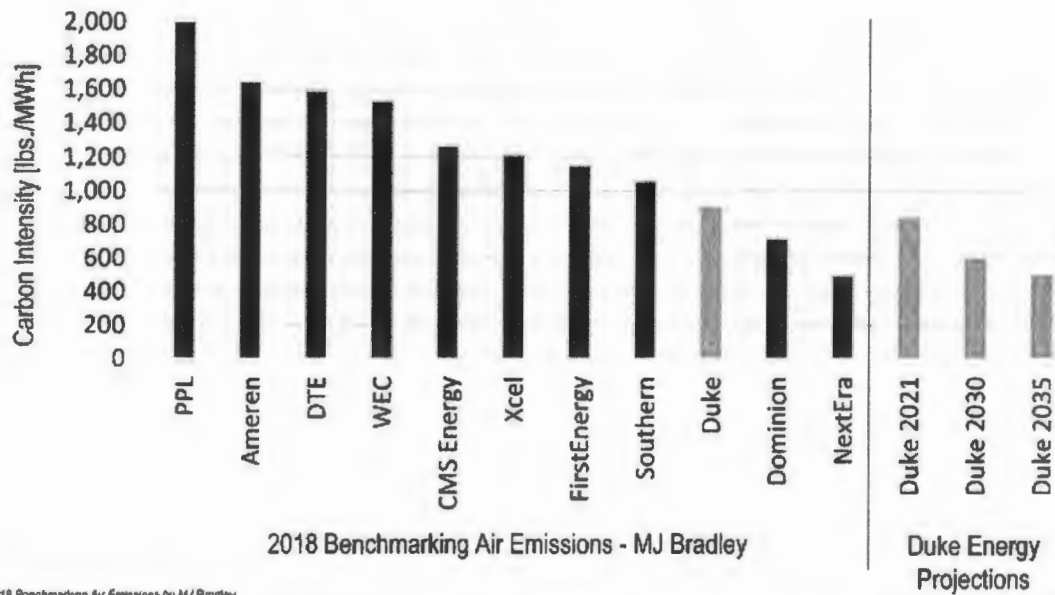


Note: *Coal co-owned with a cooperative utility and Virginia City Hybrid Energy Center are exceptions; TVA sites potential to retire additional 2.2GW coal if cost-effective; Dominion SCE&G IRP explored additional 1.3GW retirements; DEI capacity excludes Edwardsport IGCC; Duke Carolinas retirement schedule based on "Earliest Practicable" scenario detailed in 2020 IRP
 Source: SNL 2019 active nameplate capacity (operating plants based on ownership % and fuel categorization, may exclude dual fuel w/ non-coal firing); planned coal retirements based on company latest IRP, utility commission reports, sustainability reports, and news releases

PLANNED RETIREMENTS IN ADDITION TO 51 UNITS (6,500 MW) RETIRED SINCE 2010

SEPTEMBER INVESTOR UPDATE 2020

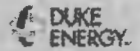
Carbon Intensity Benchmarks and Duke Energy Projections



Source: 2018 Benchmarking Air Emissions by MJ Bradley

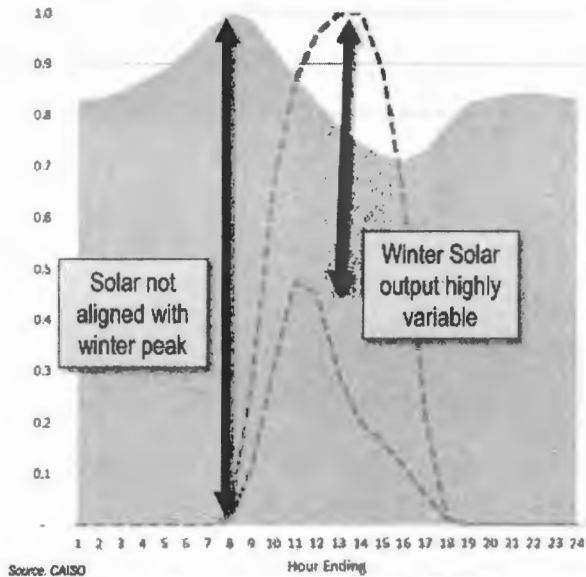
CARBON INTENSITY RATE OF THE DEC/DEP COMBINED FLEET IS 37% LOWER THAN THE INDUSTRY AVERAGE

Serving the Carolinas Winter Peak

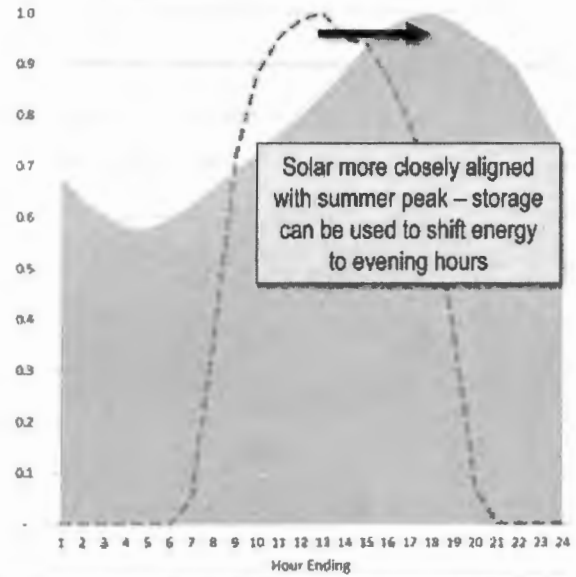


--- Solar Generation ■ Load

Carolinas: winter peaking



California: summer peaking

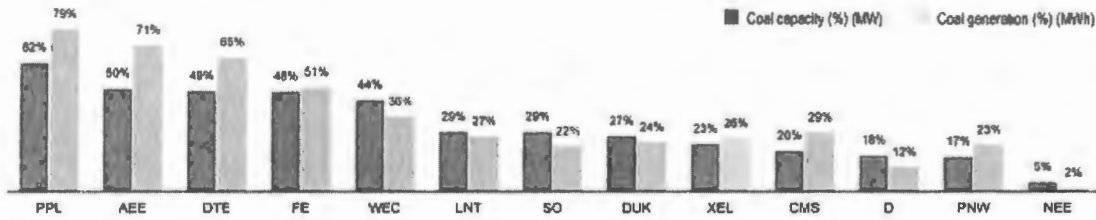


**SOLAR + STORAGE INSUFFICIENT TO MEET WINTER PEAK IN THE CAROLINAS;
NATURAL GAS GENERATION NEEDED TO SUPPLY POWER ON COLD/DARK MORNINGS**

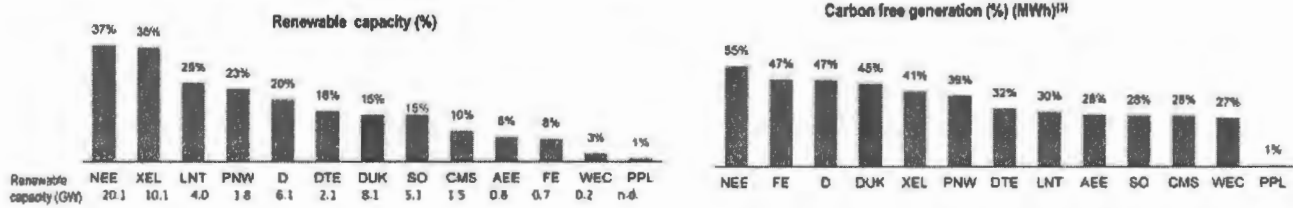
Environmental track record



Duke is less "coal-heavy" than other utilities and has done more to reduce its carbon footprint⁽¹⁾



Duke has significantly expanded into renewables, in line with peers⁽¹⁾⁽²⁾



Source: S&P, Company filings. Note: Generation mix includes owned and purchased power

(1) AEE and FE data reflects 2019 generation data given lack of disclosure

(2) Represents renewables (commercial and regulated, including conventional hydro) + nuclear capacity and inclusive PPAs in addition to owned generation

(3) DUK excludes pumped storage hydro capacity / generation (includes conventional hydro and purchased renewable power)

STRONG TRACK RECORD OF CARBON REDUCTION IN LINE WITH INDUSTRY PEERS

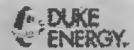


Premium Utility Franchises With Attractive Fundamentals



SEPTEMBER 2014/2015 UPDATE 205

Duke Completed Its Portfolio Transition Ahead of Peers



CURRENT INDUSTRY THEMES



Divestiture of merchant
businesses

Announced exit from Midwest generation in 2014

Regulated business M&A

Announced acquisition of Piedmont in 2015

Divestiture of international
businesses

*Announced exit from Duke Energy International
business in 2016*

ESG focus

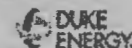
Announced net-zero carbon goal in 2019

Focus on O&M cost
management

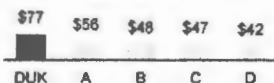
Kept O&M flat since 2016

TODAY'S DUKE ENERGY IS A WELL-RUN REGULATED ELECTRIC AND GAS UTILITY

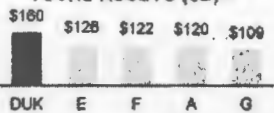
Duke Energy Is The Largest Regulated Utility In North America



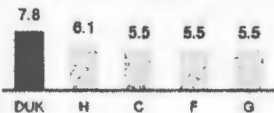
NORTH AMERICAN RATE BASE AS OF 12/31/2019 (\$B)⁽¹⁾



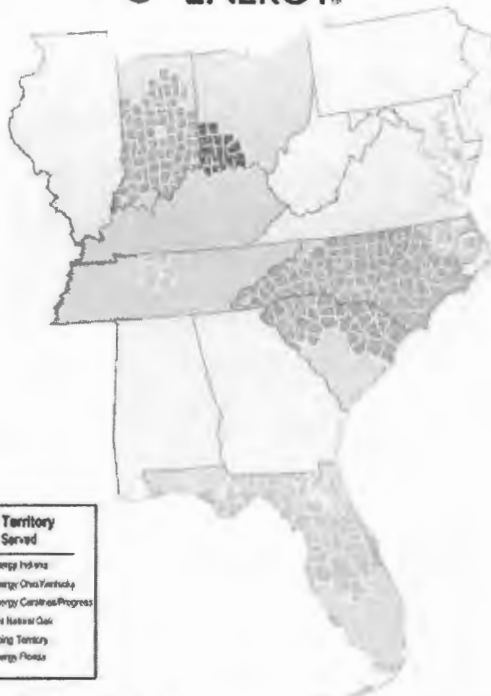
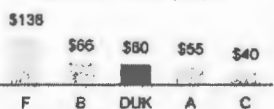
TOTAL ASSETS (\$B)⁽²⁾



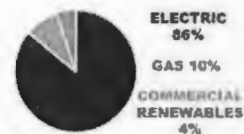
NORTH AMERICAN ELECTRIC CUSTOMERS (MM)



MARKET CAP (\$B)⁽³⁾



\$56 B 5-YEAR CAPITAL PLAN



53 GWS TOTAL GENERATING CAPACITY



310 K ELECTRIC T&D MILES

33 K GAS PIPELINE MILES

29 K EMPLOYEES

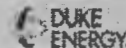
(1) DUK excludes \$2B Atlantic Coast Pipeline investment

(2) Balance sheet data as of 6/30/2020

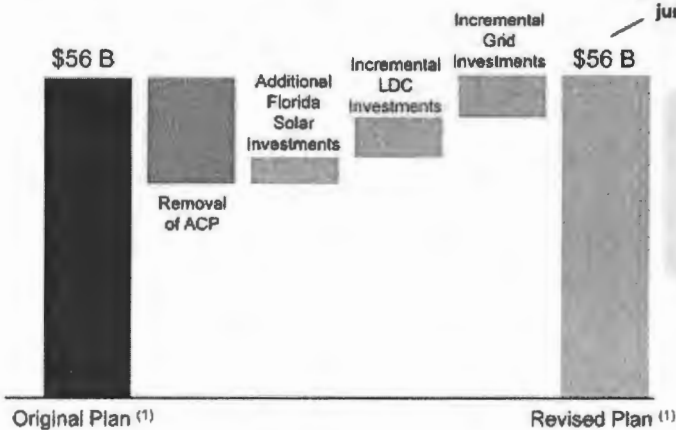
(3) As of August 25, 2020

Note: Peers listed as letters above include AEP, Berkshire Hathaway Energy, D, EXC, FE, NEE, PCG, and SO

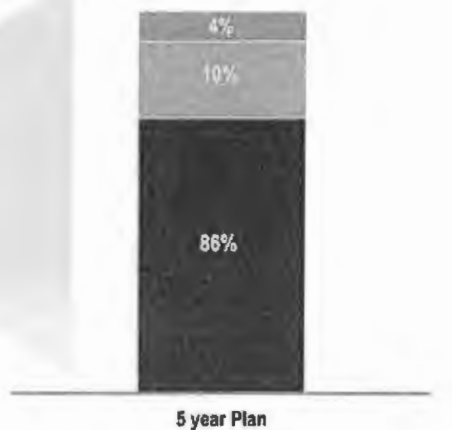
Earnings growth predicated on \$56 billion 5-year capital plan



\$56 BILLION, 5-YEAR CAPITAL PLAN REMAINS INTACT



2020-2024 CAPEX BREAKDOWN



■ Electric ■ Gas - LDC ■ Commercial Renewables

Emerging infrastructure needs

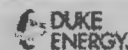
- Piedmont LDC investments for the eastern part of NC replacing ACP need
- Grid upgrades and emerging infrastructure across all of our jurisdictions
- Additional solar investments from Florida's 750MW, Clean Energy Connection program
- Increasing focus on fleet transition including renewables and battery storage

⁽¹⁾ For illustrative purposes. Total amounts are not to scale.

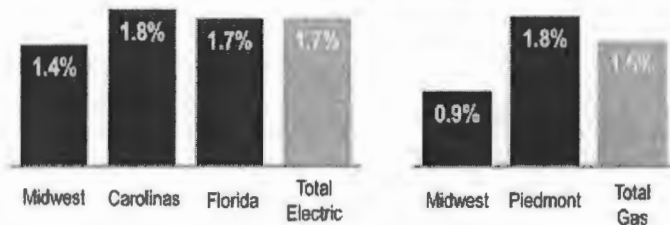
Continued strong organic customer growth underlies 5-year capital plan

- Low-risk, smaller scale projects
- Nearly 2% customer growth in the Southeast YTD Q2 2020

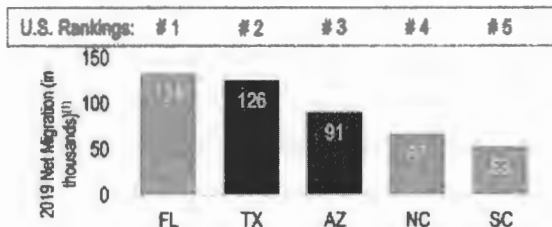
Strong customer growth in vibrant economies



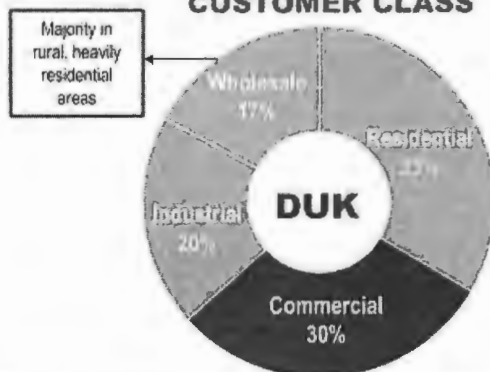
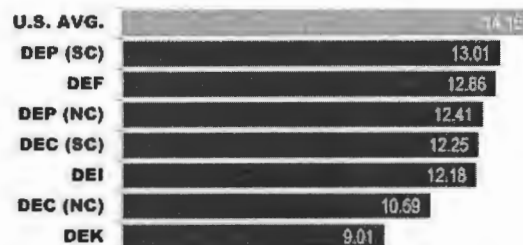
YTD Q2 2020 GROWTH IN NUMBER OF RESIDENTIAL CUSTOMERS



SERVING THREE OF THE MOST VIBRANT STATES IN THE COUNTRY



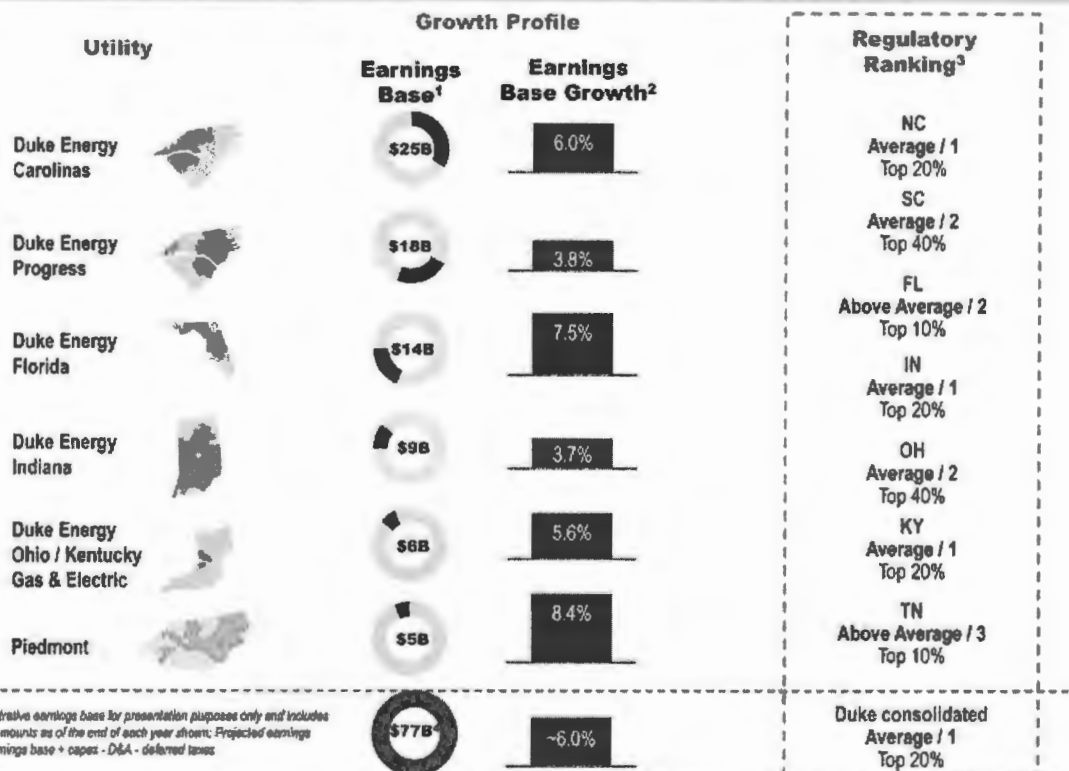
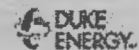
TOTAL ELECTRIC SALES BY CUSTOMER CLASS

COMPETITIVE CUSTOMER RATES⁽²⁾

(1) Source: Wells Fargo Securities; U.S. Department of Commerce

(2) Residential customer rates. Typical bill rates (\$/kWh) in effect as of July 1, 2019. Vertically integrated utilities only. Source: E&E Typical Bills and Avg. Rates Report, Winter 2019

And supportive regulatory relationships



(1) 2019A, in billions. Illustrative earnings base for presentation purposes only and includes retail and wholesale. Amounts as of the end of each year shown. Projected earnings base = prior period earnings base + capex - D&A - deferred taxes

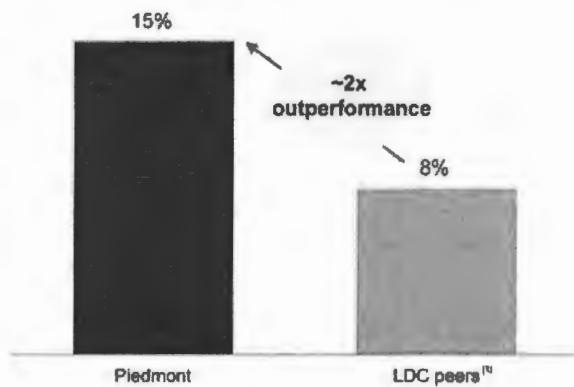
(2) 2019A-2024E CAGR

(3) State regulatory rankings reflect the average assessment across 53 regulatory jurisdictions published independently by RRA and S&P Global Ratings. RRA ranks jurisdictions as Above Average, Average and Below Average, with a sub-ranking of 1-3 for each status. Duke's weighted average rating of Average / 1 reflects the highest average rating prior to Above Average.

(4) Excludes \$2B Atlantic Coast Pipeline investment

INDUSTRY LEADING LDC BUSINESS

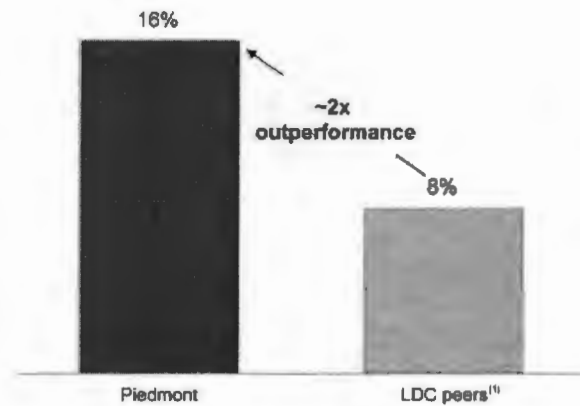
EARNINGS BASE GROWTH (\$B)



2016A-2020E Rate Base CAGR (\$mm)

Nearly doubled earnings base growth vs. U.S. pure-play listed LDCs

NET INCOME GROWTH (\$MM)



2015A-2020E Net Income CAGR (\$mm)

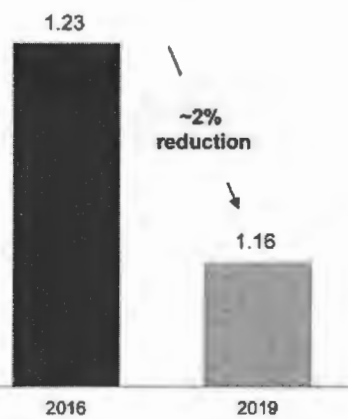
Doubled net income growth vs U.S. pure-play listed LDCs

(1) Peers include ATD, NWN, OGS, and SR

Piedmont's Customers Have Benefitted Under Duke Ownership



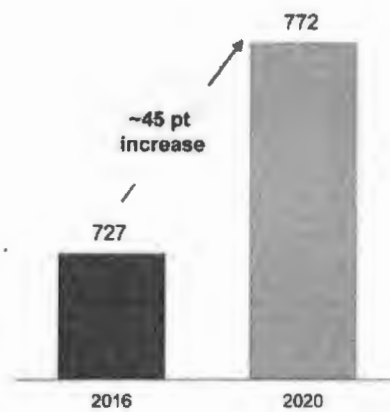
LOW CUSTOMER BILLS (\$/therm)



Average Customer Bill

Lower rates in all three
Piedmont jurisdictions

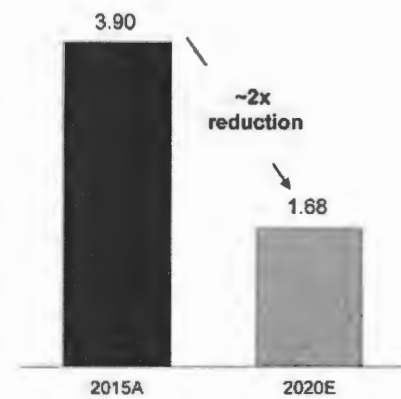
HIGH CUSTOMER SATISFACTION



Customer Satisfaction Metric

Significant improvement in
customer satisfaction metrics

STRONG SAFETY RECORD



TICR Safety Metrics

Greater than 2x reduction in
Total Incident Case Rate (TICR)



Track Record of Operational Performance



SEPTEMBER INVESTOR UPDATE 2020

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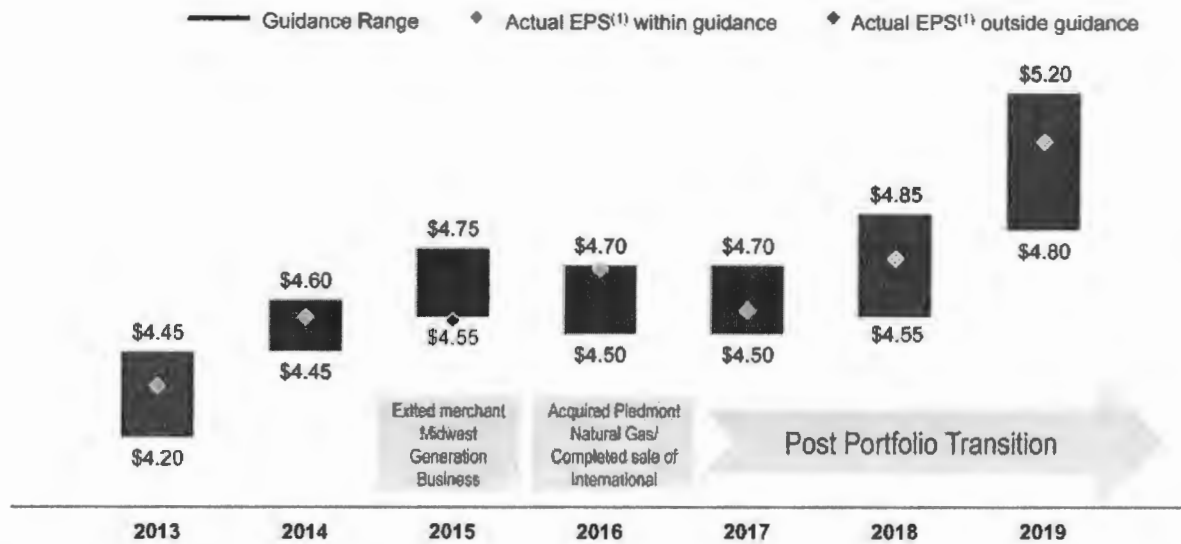
Strong Track Record of Performance

- ✓ Met annual guidance in 7 of the last 8 years while exiting businesses with volatile earnings
- ✓ Kept O&M flat, including absorbing ~\$300 million of O&M from the Piedmont acquisition in 2016, in addition to offsetting wage / salary increases and general inflation
- ✓ Earned at or above allowed ROE's on a consistent basis
- ✓ Consistently maintained customer bills below national average across all jurisdictions
- ✓ Achieved all-time high in customer satisfaction measures in 2Q20, reinforcing the effectiveness of our customer and community outreach
- ✓ Remained one of the electric utility industry's top leaders in safety performance for fifth year in a row

Strong Track Record of Meeting EPS Guidance



ADJUSTED EARNINGS PER SHARE VS. GUIDANCE



Met annual guidance in 7 of the last 8 years, with our sole miss coming in 2015 by \$0.01/sh

(1) Based on Adjusted EPS

**OUTSTANDING PROJECT MANAGEMENT
ON KEY PROJECTS...**

- ✓ **Citrus County Combined Cycle (CC) – 1,640 MW**
 - \$1.5 billion investment recovered through GBRA mechanism in FL
- ✓ **Lee CC – 750 MW**
 - \$700mm investment
 - Required additional Piedmont infrastructure
- ✓ **Asheville CC – 570 MW**
 - Part of \$1.4 B Western Carolinas Modernization Plan to retire coal early and increase renewables
- ✓ **Edwardsport IGCC – 618 MW**
 - Completed this advanced technology project when others could not
 - Cost recovery moved to base rates as requested/ approved in most recent rate case
- ✓ **Other significant generation adds to replace coal**
 - Total of 8 GW generation added since 2010

**...AND PRUDENT DECISIONS TO NO LONGER
PURSUE PROJECTS WHEN POTENTIAL RISKS
EXCEED REWARDS**

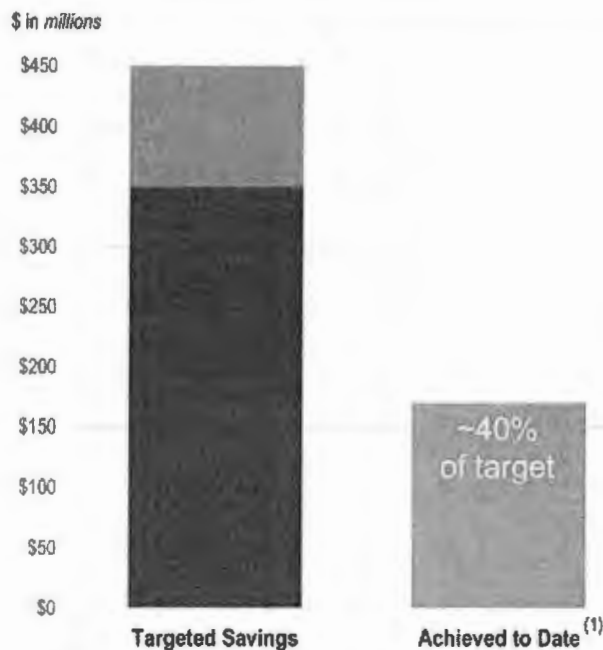
- ✓ **Levy and Lee new nuclear**
 - Had received approval, but post-Toshiba and Westinghouse bankruptcy saw too much risk
 - Shifted investment to augmenting natural gas and solar generation
- ✓ **Crystal River Nuclear Plant (CR3)**
 - Stopped investment and recovered legacy Progress investment via securitization
- ✓ **Atlantic Coast Pipeline**
 - Permitting delays and legal challenges created unacceptable cost uncertainty

Prudent decision making and efficient execution

With 2020 Additional O&M Cost Savings Well Underway



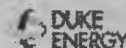
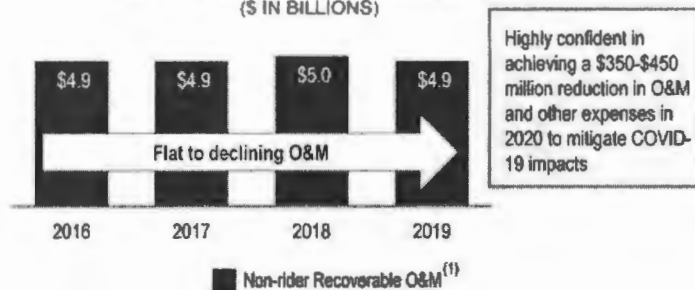
- Highly confident in achieving a \$350-\$450 million reduction in O&M and other expenses to mitigate 2020 headwinds
 - Unparalleled capability to mitigate headwinds given our size, scale and agility
- Clear line-of-sight of savings initiatives to achieve targets
 - Revised scope and timing of generation outages
 - Contract and employee labor costs, including overtime and variable compensation
 - Employee expenses reductions
 - Lower corporate costs such as IT expenditures
 - Lower interest expense due to well-timed capital market transactions
- Achieved \$170 million in savings through 2Q, with ability to deliver near the high end of mitigation range
 - Rapid response ability is a core competency
 - Business transformation team is developing solutions to make many of these initiatives sustainable for 2021 and beyond



⁽¹⁾ Remaining cost mitigation efforts are expected to be more heavily weighted to the 4th quarter than the 3rd quarter.

DEMONSTRATED TRACK RECORD OF CONSISTENTLY DELIVERING O&M AND OTHER COST SAVINGS IN AN AGILE FASHION SINCE 2015

Strong O&M Cost Management


O&M COST MANAGEMENT
 (\$ IN BILLIONS)

TOP QUARTILE O&M PROFILE
 (Non-Generation O&M \$/Customer⁽²⁾)

TOP TIER COST MANAGEMENT CONTINUES

- Outstanding track record of cost management
- Since 2015, we have kept non-recoverable O&M flat
 - Includes absorbing ~\$300 million of O&M from the Piedmont acquisition in 2016, in addition to offsetting wage and salary increases and general inflation
- Leveraging increased cost flexibility to keep non-rider recoverable O&M flat despite inflation
- Employing data analytics and digital capabilities to enhance decision making and prioritization
- State of the art Innovation Center – Optimist Hall
- Utilizing cost saving opportunities as a lever to meet business commitments
- Applying our size and scale to transform operational capabilities

(1) Non-rider Recoverable O&M excludes special items and other non-recoverable charges incurred. For a reconciliation to GAAP O&M see accompanying materials at www.duke-energy.com/investors

(2) S&P Global Market Intelligence: SNL Energy Data as sourced from FERC Form 1. Data from over 128 U.S. Regulated Utilities with more than 100,000 customers, rounded.



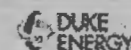
Focus on Balance Sheet Management



SEPTEMBER INVESTOR UPDATE 2021

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Our utilities have strong credit metrics that support our corporate rating



Rated Issuers

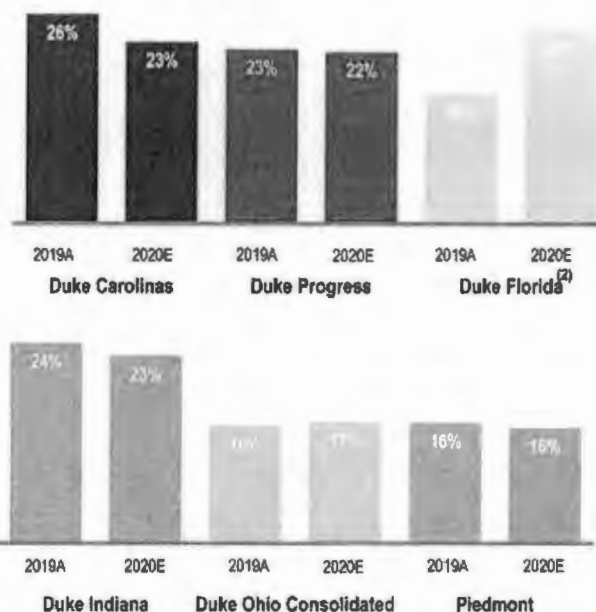
	Moody's	S&P
DUKE ENERGY CORPORATION	Stable	Stable
Senior Unsecured Debt	Baa1	BBB+
Commercial Paper	P-2	A-2
PROGRESS ENERGY, INC.	Stable	Stable
Senior Unsecured Debt	Baa1	BBB+
DUKE ENERGY CAROLINAS, LLC	Stable	Stable
Senior Secured Debt	Aa2	A
Senior Unsecured Debt	A1	A-
DUKE ENERGY PROGRESS, LLC	Stable	Stable
Senior Secured Debt	Aa3	A
DUKE ENERGY FLORIDA, LLC	Stable	Stable
Senior Secured Debt	A1	A
Senior Unsecured Debt	A3	A-
DUKE ENERGY INDIANA, LLC	Stable	Stable
Senior Secured Debt	Aa3	A
Senior Unsecured Debt	A2	A-
DUKE ENERGY OHIO, INC.	Stable	Stable
Senior Secured Debt	A2	A
Senior Unsecured Debt	Baa1	A-
DUKE ENERGY KENTUCKY, INC.	Stable	Stable
Senior Unsecured Debt	Baa1	A-
PIEDMONT NATURAL GAS, INC.	Stable	Stable
Senior Unsecured Debt	A3	A-

Note: Fitch announced on January 21, 2020 its intention to withdraw ratings on Duke Energy Corp within 30 days due to commercial reasons

(1) Key adjustments within the computation include the removal of coal ash remediation spending from FFO, and the adjusted debt balance excludes purchase accounting adjustments

(2) Assumes securitization treated as off credit

FFO/Debt⁽¹⁾



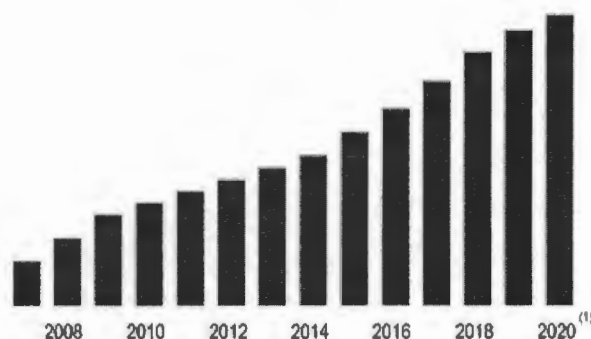
PRUDENT BALANCE SHEET MANAGEMENT

- Strong available liquidity position of \$8.7 billion as of Jun. 30
- Stable outlooks at Moody's and S&P
- Expect to receive remaining refundable AMT credits of ~\$575 million in 2020
 - AMT credits and O&M reductions support consolidated FFO/Debt of ~15% in 2020
- Equity forward of \$2.5 billion priced in Nov. 2019 expected to be settled by year-end 2020
 - Executed transaction opportunistically based on favorable market conditions and prior to COVID-related market sell-off
 - Transaction was sized to address a variety of scenarios including cancellation of ACP
- Continued annual equity issuances in our plan of \$500 million per year through 2022 via DRIP/ATM programs
- Pension plan is fully funded as of Jul. 2020

(1) 2% increase to quarterly dividend declared by the board of directors on July 7, 2020.

(2) Based on adjusted EPS

INCREASED QUARTERLY DIVIDEND PAYMENT FOR THE 14TH CONSECUTIVE YEAR



■ Annualized 4Q dividend per share

65% - 75%
LONG-TERM TARGET DIVIDEND
PAYOUT RATIO⁽²⁾



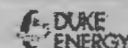
Appendix



SEPTEMBER INVESTOR UPDATE 2011

7/12/11

ESG is an essential component of Duke Energy's strategy



ENVIRONMENTAL



- Industry-leading climate goal of net-zero carbon emissions by 2050
- Announced over 1,500 MW of new wind and solar projects in 2019
- Further reduced CO₂ emissions by an additional 8% in 2019 from 2005 levels, bringing total decrease to 39%
- Named to Dow Jones Sustainability North America Index for 14 years in a row
- Clear leader in energy efficiency savings in Southeast

SOCIAL RESPONSIBILITY



- One of the industry leaders for 5th year in a row in safety
- Named one of "America's Best Employers" by Forbes in 2019 and one of Fortune's "Worlds Most Admired Companies" for 3rd consecutive year
- Earned perfect score for third year in a row on the Human Rights Campaign Corporate Equality Index; also awarded "Best Places to Work for LGBTQ Equality"

GOVERNANCE & TRANSPARENCY



- Bloomberg ESG disclosure score of 57.4, the third best score and in the top quartile of U.S. utilities
- Climate report utilizes TCFD⁽¹⁾ framework; our pathway is consistent with 2-degree scenario
- 2019 board refreshment enhanced diversity (40% racial, gender and ethnic diversity)
- Strong ESG ratings from ISS Quality Score in 2019

Join us for our Inaugural ESG Analyst Day via live webcast on Oct. 9, 2020

⁽¹⁾ TCFD – Task Force on Climate-related Financial Disclosures

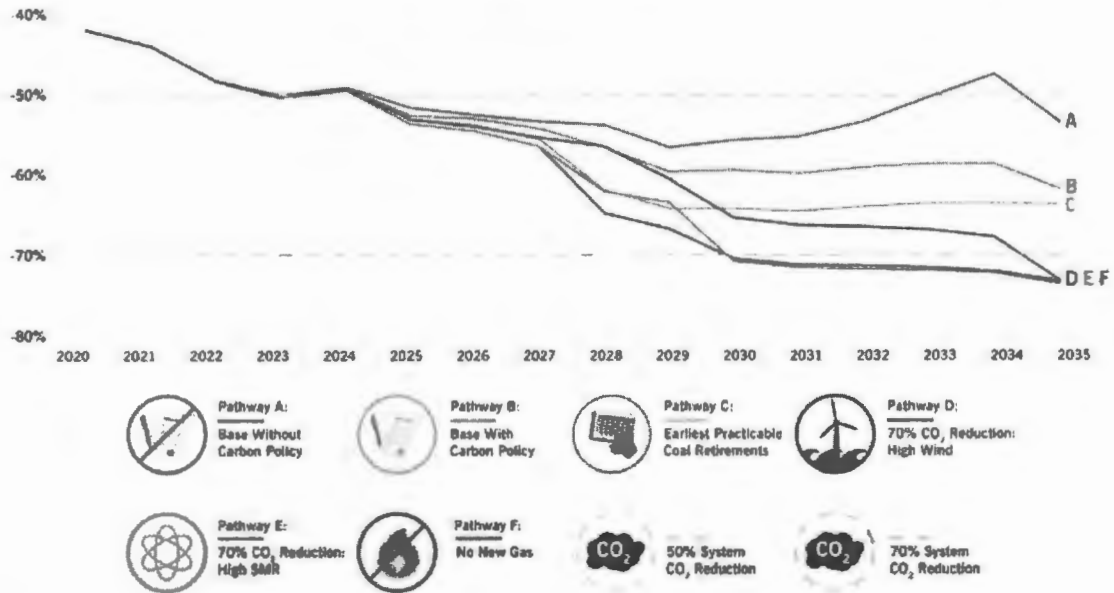
- Studies supporting resource methodology
 - Natural gas enables the acceleration of coal retirements by providing replacement winter peak resources as the integration of renewable resources and battery technology continues to advance
 - Berkeley Earth: "This research suggests that using natural gas as a bridge fuel away from coal is viable if we cannot immediately transition to near-zero carbon technologies. Coal is responsible for the bulk of U.S. CO₂ emissions from electricity generation, and gas provides a practical way to reduce such emissions, even when we include the effects of fugitive methane."
 - Kenan Institute at UNC: "The path to electricity de-carbonization via solely replacing fossil fuels with wind/solar will be much more expensive than widely perceived and point to the need for alternative and/or hybrid solutions, which may include combining wind/solar with natural gas, nuclear, carbon capture/sequestration and some level of carbon taxes"
 - Joule: "The role of firm low-carbon electricity resources in deep decarbonization of power generation" concludes the least-cost strategy to decarbonize electricity includes one or more firm low-carbon resources (including nuclear and natural gas). Without these resources, electricity costs rise rapidly as CO₂ limits approach zero.
 - Balancing renewable generation and use of battery storage
 - NREL (National Renewable Energy Laboratory):
 - Carbon Free Resource Integration Study evaluated the planning and operational considerations of integrating increasing levels of carbon-free resources onto the Duke Energy Carolinas and Duke Energy Progress systems
 - Grid-scale battery storage provides technical expertise related to the discharge capabilities of batteries
- 3rd party modeling assumptions
 - Nexant: Energy efficiency and Market potential study
 - Astrape Consulting: Reserve margin study
 - Tierra Resource Consultants, Proctor Engineering Group and Dunskey: Winter specific demand response and rate design benchmarking study
 - Pricing inputs provided by: Navigant, Energy Information Administration (EIA) Annual Energy Outlook, Guidehouse

- The 2020 IRP includes a most economic or "least-cost" portfolio, as required by North Carolina Utilities Commission (NCUC) Rule R8-60 and subsequent orders, and the Public Service Commission of South Carolina (PSCSC) and The Energy Freedom Act (Act 62), as well as multiple portfolios reflecting a range of potential future resource portfolios
- North Carolina requirements
 - 2 base cases: least cost resources (with and without price on carbon). Additional carbon and coal retirement analyses required for 2020 IRPs
 - NCUC will not "approve" the IRPs; rather, after a formal docket review with intervenors, the NCUC will "accept" the IRPs as reasonable for planning purposes (or reject some aspects of the IRP or make recommendations for future IRPs)
 - New generation resources will need to go through specific CPCN approval processes prior to construction and must demonstrate consistency with the most recent IRP
- South Carolina requirements
 - First IRP filed under Act 62; which contemplates several resource portfolios developed with the purpose of fairly evaluating the range of demand-side, supply-side, storage, and other technologies and services available to meet the utility's service obligations; PSCSC will approve or deny or modify; testimony and adversarial evidentiary hearings anticipated
 - Regulatory condition requires utility to utilize least cost planning
 - New resources will go through new Act 62 processes and statutory requirements for cost recovery, which do note a competitive procurement process.

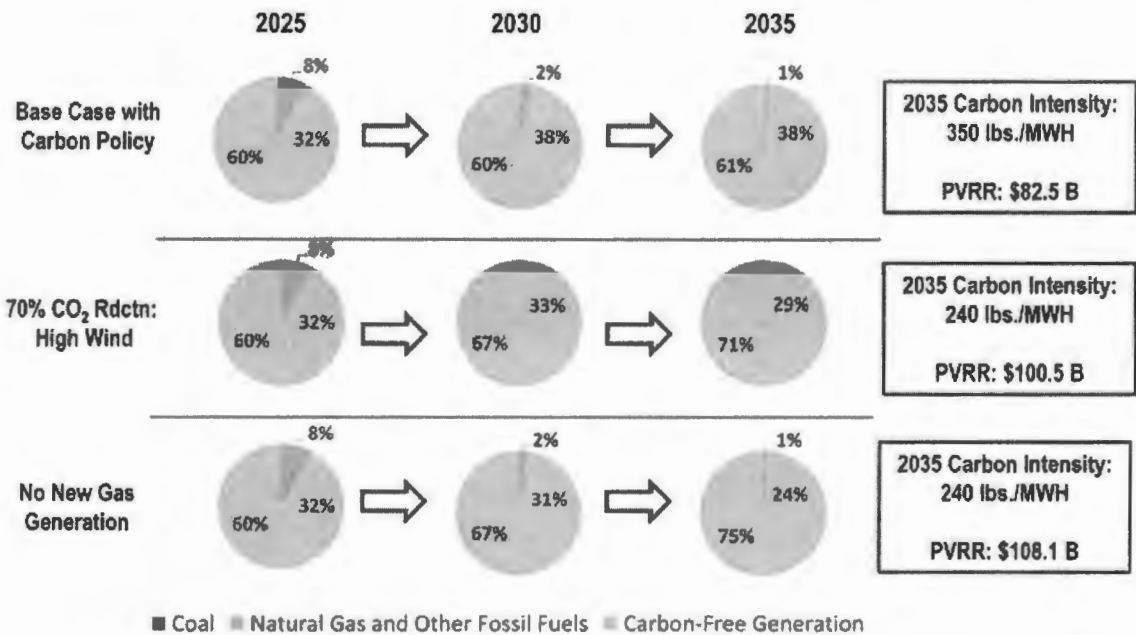
Carolinas IRPs: Carbon Reduction by Scenario



CARBON REDUCTION BY SCENARIO



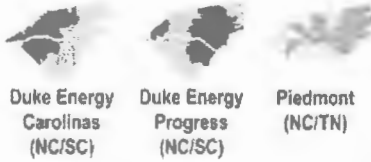
Carolinas IRPs: Generation Mix by Portfolio



SIGNIFICANT CARBON REDUCTIONS ACHIEVED IN ALL SCENARIOS

UTILITIES IN HIGH-QUALITY REGIONS OF THE U.S.

CAROLINAS



FLORIDA



MIDWEST



COMPETITIVE CUSTOMER RATES⁽¹⁾

RESIDENTIAL

U.S. AVG.	14.16
DEF (SC)	13.01
DEF	12.86
DEF (NC)	12.41
DEC (SC)	12.25
DEI	12.18
DEC (NC)	10.59
DEK	9.01

COMMERCIAL

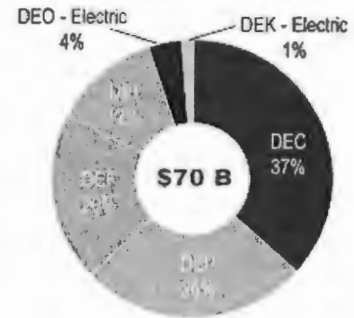
U.S. AVG.	11.52
DEC (SC)	10.77
DEF	10.40
DEI	10.13
DEK	9.38
DEC (NC)	9.28
DEF (SC)	9.22
DEF (NC)	9.09

INDUSTRIAL

U.S. AVG.	10.15
DEF	9.56
DEI	9.01
DEK	8.71
DEC (SC)	8.53
DEC (NC)	8.45
DEF (NC)	8.29
DEF (SC)	8.14

(1) Typical bill rates (¢/kWh) in effect as of July 1, 2019. Vertically integrated electric utilities only. Source: EEI Typical Bills and Avg. Rates Report, Winter 2019

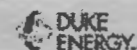
REGULATED ELECTRIC 2019 EARNINGS BASE



BALANCED CUSTOMER MIX



Peer utility benchmarking



Ranked by net electric utility plant value (\$mm)

Key Metrics

	DUKE ENERGY	Peer A	Peer B	Peer C	Peer D	Peer E	Peer F	Peer G	Peer H	Peer I
Total electric sales (GWh)	206,584	147,734	134,866	196,403	122,489	117,172	89,441	49,988	51,286	36,077
Electric customers (000's)	7,800	4,270	5,500	9,100	5,470	3,500	3,700	3,800	3,110	1,628
Electric non-generation O&M / MWh	\$15	\$14	\$39	\$55	\$10	\$46	\$29	\$99	\$113	\$28
Electric non-generation O&M / Customer	\$382	\$493	\$594	\$430	\$225	\$482	\$549	\$602	\$692	\$619
Dist. miles / 1000 customers	36	42	7	16	14	24	56	36	19	43
Distribution line miles	280,100	179,000	40,000	149,945	75,751	85,000	207,524	134,903	58,332	70,600

Clear top-tier performance in O&M cost management

Sources: SNL FERC Form 1, annual filings and investor presentations; data as of YE 2019 unless otherwise noted



TRANSFORM THE
CUSTOMER EXPERIENCE



MODERNIZE THE
ENERGY GRID



GENERATE
CLEANER ENERGY



EXPAND **NATURAL GAS**
INFRASTRUCTURE



STAKEHOLDER
ENGAGEMENT

**EMPLOYEE ENGAGEMENT AND OPERATIONAL EXCELLENCE
ARE FOUNDATIONAL TO OUR SUCCESS**

Our investor value proposition



DUK
LISTED
NYSE

A STRONG LONG-TERM RETURN PROPOSITION

DUK
LISTED
NYSE



**CONSTRUCTIVE JURISDICTIONS, LOW-RISK REGULATED
INVESTMENTS AND BALANCE SHEET STRENGTH**

(1) As of Aug. 6, 2020

(2) Subject to approval by the Board of Directors.

(3) Total shareholder return proposition at a constant P/E ratio

(4) Based on adjusted EPS



Upcoming events & other



SEPTEMBER 11/ESTOP UPDATE 3:00

9/11

I/A

Upcoming events



Event	Date
2020 ESG Investor day	October 9, 2020
3Q 2020 earnings call	Early November 2020

BRYAN BUCKLER, VICE PRESIDENT INVESTOR RELATIONS

- Bryan.Buckler@duke-energy.com
- (704) 382-2640

CINDY LEE, DIRECTOR INVESTOR RELATIONS

- Cynthia.Lee@duke-energy.com
- (980) 373-4077

ABBY MOTSINGER, MANAGER INVESTOR RELATIONS

- Abby.Motsinger@duke-energy.com
- (704) 382-7624



For additional information on Duke Energy,
please visit: duke-energy.com/investors

Duke Energy Corporation
 Non-GAAP Reconciliations
 Duke Energy Investor Update
 September 2020

Adjusted Earnings per Share (EPS)

The materials for Duke Energy Corporation's (Duke Energy's) Investor Update in September 2020 include a discussion of adjusted EPS for the year-to-date periods ended December 31, 2019, 2018, 2017, 2016, 2015, 2014 and 2013.

The non-GAAP financial measure, adjusted EPS, represents basic EPS available to Duke Energy Corporation common stockholders (GAAP reported EPS), adjusted for the per share impact of special items. Special items represent certain charges and credits which management believes are not indicative of Duke Energy's ongoing performance.

Management believes the presentation of adjusted EPS provides useful information to investors, as it provides them with an additional relevant comparison of Duke Energy's performance across periods. Management uses this non-GAAP financial measure for planning and forecasting and for reporting financial results to the Duke Energy Board of Directors, employees, stockholders, analysts and investors. Adjusted EPS is also used as a basis for employee incentive bonuses. The most directly comparable GAAP measure for adjusted EPS is reported basic EPS available to Duke Energy Corporation common stockholders. Reconciliations of adjusted EPS for the year-to-date periods ended December 31, 2019, 2018, 2017, 2016, 2015, 2014 and 2013, to the most directly comparable GAAP measures are included here-in.

Adjusted EPS Guidance

The materials for Duke Energy's Investor Update in September 2020 include a reference to the forecasted 2019, 2018, 2017, 2016, 2015, 2014 and 2013, adjusted EPS guidance range per share. The materials also reference the long-term range of annual growth of 4% - 6%. The forecasted adjusted EPS is a non-GAAP financial measure as it represents basic EPS available to Duke Energy Corporation common stockholders (GAAP reported EPS), adjusted for the per share impact of special items, as discussed above under Adjusted EPS. Due to the forward-looking nature of this non-GAAP financial measure for future periods, information to reconcile it to the most directly comparable GAAP financial measure is not available at this time, as management is unable to project all special items for future periods, such as legal settlements, the impact of regulatory orders or asset impairments.

Available Liquidity

The materials for Duke Energy's Investor Update in September 2020 include a discussion of Duke Energy's available liquidity balance. The available liquidity balance presented is a non-GAAP financial measure as it represents cash and cash equivalents, excluding certain amounts held in foreign jurisdictions and cash otherwise unavailable for operations, the remaining availability under Duke Energy's available credit facilities, including the master credit facility and available equity forwards. The most directly comparable GAAP financial measure for available liquidity is cash and cash equivalents. A reconciliation of available liquidity as of June 30, 2020, to the most directly comparable GAAP measure is included here-in.

Non-Rider Recoverable O&M

The materials for Duke Energy's Investor Update in September 2020, include a discussion of Duke Energy's non-rider recoverable operating, maintenance and other expenses (O&M) for the year-to-date periods ended December 31, 2019, 2018, 2017 and 2016. Non-rider recoverable O&M expenses are non-GAAP financial measures, as they represent reported O&M expenses adjusted for special items and expenses recovered through riders. The most directly comparable GAAP financial measure for non-rider recoverable O&M expenses is reported operating, maintenance and other expenses. A reconciliation of non-rider recoverable O&M expenses for the year-to-date periods ended December 31, 2019, 2018, 2017, and 2016 to the most directly comparable GAAP measure are included here-in.

Dividend Payout Ratio

The materials for Duke Energy's Investor Update in September 2020, include a discussion of Duke Energy's forecasted dividend payout ratio of 65% - 75% based upon adjusted EPS. This payout ratio is a non-GAAP financial measure as it is based upon forecasted basic EPS available to Duke Energy Corporation common stockholders (GAAP reported EPS), adjusted for the per-share impact of special items, as discussed above under Adjusted EPS. The most directly comparable GAAP measure for adjusted EPS is reported basic EPS available to Duke Energy Corporation common stockholders. Due to the forward-looking nature of this non-GAAP financial measure for future periods, information to reconcile it to the most directly comparable GAAP financial measure is not available at this time, as management is unable to project all special items, as discussed above under Adjusted EPS Guidance.

Funds From Operations ("FFO") Ratios

The materials for Duke Energy's Investor Update in September 2020, include a reference to historical and expected FFO to Total Debt ratios. These ratios reflect non-GAAP financial measures. The numerator of the FFO to Total Debt ratio is calculated principally by using net cash provided by operating activities on a GAAP basis, adjusted for changes in working capital, ARO spend, depreciation and amortization of operating leases and reduced for capitalized interest (including any AFUDC interest). The denominator for the FFO to Total Debt ratio is calculated principally by using the balance of long-term debt (excluding purchase accounting adjustments and long-term debt associated with the CR3 Securitizations) including current maturities, imputed operating lease liabilities, plus notes payable, commercial paper outstanding, underfunded pension liability, guarantees on joint-venture debt, and adjustments to hybrid debt and preferred stock issuances based on how credit rating agencies view the instruments. The calculation of FFO to Total Debt ratio for the year ended December 31, 2019 is included here-in. Due to the forward-looking nature of this non-GAAP financial measure for future periods, information to reconcile it to the most directly comparable GAAP financial measure is not available at this time, as management is unable to project all special items, as discussed above under Adjusted EPS Guidance.

Business Mix Percentage

The materials for Duke Energy's Investor Update in September 2020, reference ninety-five percent of earnings coming from the regulated electric and gas utilities as a percentage of the total projected 2020 adjusted net income (i.e. business mix), excluding the impact of Other. Duke Energy's regulated electric and gas utilities are included in the Electric Utilities and Infrastructure and Gas Utilities and Infrastructure segments, respectively.

Adjusted segment income is a non-GAAP financial measure, as it represents reported segment income adjusted for special items. Due to the forward-looking nature of any forecasted adjusted segment income information to reconcile this non-GAAP financial measure to the most directly comparable GAAP financial measure is not available at this time, as management is unable to project all special items (as discussed above under Adjusted EPS Guidance).

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
Year Ended December 31, 2019
(Dollars in millions, except per-share amounts)

	<u>Special Items</u>				
	<u>Reported Earnings</u>	<u>Impairment Charge</u>	<u>Discontinued Operations</u>	<u>Total Adjustments</u>	<u>Adjusted Earnings</u>
SEGMENT INCOME					
Electric Utilities and Infrastructure	\$ 3,534	\$ (27) A	\$ —	\$ (27)	\$ 3,509
Gas Utilities and Infrastructure	432	19 B	—	19	451
Commercial Renewables	198	—	—	—	198
Total Reportable Segment Income	4,168	(8)	—	(8)	4,168
Other	(452)	—	—	—	(452)
Discontinued Operations	(7)	—	7 C	7	—
Net Income Available to Duke Energy Corporation Common Stockholders	\$ 3,707	\$ (8)	\$ 7	\$ (1)	\$ 3,706
EPS AVAILABLE TO DUKE ENERGY CORPORATION COMMON STOCKHOLDERS, BASIC	\$ 5.06	\$ (0.01)	\$ 0.01	\$ —	\$ 5.06

Note: Earnings Per Share amounts are adjusted for accumulated but not yet declared dividends for Series B Preferred Stock of \$(0.02).

A — Net of \$9 million tax expense. \$36 million reduction of a prior year impairment recorded within impairment charges for the Citrus County CC project on Duke Energy Florida's Consolidated Statements of Operations.

B — Net of \$6 million tax benefit. \$25 million included within Other Income and Expenses on the Consolidated Statements of Operations, related to the other-than-temporary-impairment of the remaining investment in Constitution Pipeline Company, LLC.

C — Recorded in (Loss) Income from Discontinued Operations, net of tax on the Consolidated Statements of Operations.

Weighted Average Shares, Diluted (reported and adjusted) — 729 million

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2018
 (Dollars in millions, except per-share amounts)

	Reported Earnings	Special Items							Total Adjustments	Adjusted Earnings
		Costs to Achieve Piedmont Budget	Regulatory and Legislative Impacts	Sale of Retired Plant	Impairment Charges	Impacts of the Tax Act	Severance	Discontinued Operations		
SEGMENT INCOME										
Electric Utilities and Infrastructure	\$ 3,058	\$ —	\$ 202 B	\$ —	\$ 46 D	\$ 24	\$ —	\$ —	\$ 272	\$ 3,330
Gas Utilities and Infrastructure	274	—	—	—	42 E	1	—	—	43	317
Commercial Renewables	9	—	—	—	91 F	(3)	—	—	88	97
Total Reportable Segment Income	3,341	—	202	—	179	22	—	—	403	3,744
Other	(694)	65 A	—	82 C	—	(2)	144 H	—	289	(406)
Discontinued Operations	19	—	—	—	—	—	—	(19) I	(19)	—
Net Income Attributable to Duke Energy Corporation	\$ 2,666	\$ 65	\$ 202	\$ 82	\$ 179	\$ 20 G	\$ 144	\$ (19)	\$ 673	\$ 3,339
EPS ATTRIBUTABLE TO DUKE ENERGY CORP. BASIC	\$ 3.78	\$ 0.88	\$ 0.29	\$ 0.12	\$ 0.25	\$ 0.03	\$ 0.21	\$ (0.03)	\$ 0.96	\$ 4.72

A - Net of \$19 million tax benefit. \$34 million recorded within Operating Expenses on the Consolidated Statements of Operations.

B - Net of \$16 million tax benefit at Duke Energy Progress and \$47 million tax benefit at Duke Energy Carolinas.

• On the Duke Energy Progress Consolidated Statement of Operations, \$32 million is recorded within impairment charges, \$31 million within Operations, maintenance and other, \$6 million within Interest Expense and \$1 million within Depreciation and amortization.

• On the Duke Energy Carolinas Consolidated Statement of Operations, \$166 million is recorded within impairment charges, \$8 million within Operations, maintenance and other, and \$1 million within Depreciation and amortization.

C - Net of \$25 million tax benefit. \$107 million recorded within Gains (Losses) on Sales of Other Assets and Other, net on the Consolidated Statement of Operations.

D - Net of \$14 million tax benefit. \$80 million recorded within impairment charges on the Consolidated Statements of Operations.

E - Net of \$13 million tax benefit. \$56 million included within Other Income and Expenses on the Consolidated Statement of Operations.

F - Net of \$2 million Noncontrolling Interests. \$93 million goodwill impairment recorded within impairment charges on the Consolidated Statements of Operations.

G - \$20 million true up of prior year Tax Act estimates recorded within Income Tax Expense from Continuing Operations on the Consolidated Statements of Operations.

H - Net of \$43 million tax benefit. \$187 million recorded within Operations, maintenance and other on the Consolidated Statements of Operations.

I - Recorded in Income (Loss) from Discontinued Operations, net of tax on the Consolidated Statements of Operations.

Weighted Average Shares, Diluted (reported and adjusted) - 700 million

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2017
 (Dollars in millions, except per-share amounts)

		Special Items							
	Reported Earnings	Costs to Achieve Fuel Cost Savings	Regulatory Settlements	Commercial Renewable Impairments	Impacts of the Tax Act	Discontinued Operations	Total Adjustments	Adjusted Earnings	
SEGMENT INCOME									
Electric Utilities and Infrastructure	\$ 3,210	\$ ---	\$ 98 B	\$ --	\$ (231)	\$ ---	\$ (133)	\$ 3,077	
Gas Utilities and Infrastructure	319	---	---	---	(38) D	---	(38)	281	
Commercial Renewables	608	---	---	74 C	(442)	---	(368)	240	
Total Reportable Segment Income	3,897	---	98	74	(669)	---	(527)	3,443	
Other	(905)	64 A	---	---	587	---	641	(244)	
Discontinued Operations	(8)	---	---	---	---	6 E	6	---	
Net Income Attributable to Duke Energy Corporation	\$ 3,058	\$ 64	\$ 98	\$ 74	\$ (182) D	\$ 6	\$ 148	\$ 3,199	
EPS ATTRIBUTABLE TO DUKE ENERGY CORP. BASIC	\$ 4.36	\$ 0.89	\$ 0.14	\$ 0.11	\$ (0.14)	\$ 0.01	\$ 0.21	\$ 4.57	

A - Net of \$38 million tax benefit. \$102 million recorded within Operating Expenses and \$1 million recorded within Interest Expense on the Consolidated Statements of Operations.

B - Net of \$80 million tax benefit. \$154 million recorded within Impairment charges and \$4 million recorded within Other Income and Expenses on the Consolidated Statements of Operations.

C - Net of \$20 million tax benefit. \$82 million recorded within Impairment charges and \$10 million recorded within Other Income and Expenses on the Consolidated Statements of Operations.

D - \$116 million benefit recorded with Income Tax Expense from Continuing Operations, offset by \$16 million expense recorded within Gas Utilities and Infrastructure's Equity in Earnings of Unconsolidated Affiliates on the Consolidated Statements of Operations.

E - Recorded in Income (Loss) from Discontinued Operations, net of tax on the Consolidated Statements of Operations.

Weighted Average Shares, Diluted (reported and adjusted) - 709 million

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2016
 (Dollars in millions, except per-share amounts)

	Special Items							Adjusted Earnings
	Reported Earnings	Costs to Achieve Synergies	Cost Savings Initiatives	Commercial Renewables Impairment	International Energy Operations	Discontinued Operations	Total Adjustments	
SEGMENT INCOME								
Electric Utilities and Infrastructure	\$ 3,040	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 3,040
Gas Utilities and Infrastructure	152	—	—	—	—	—	—	152
Commercial Renewables	23	—	—	45 C	—	—	45	68
Total Reportable Segment Income	3,215	—	—	45	—	—	45	3,260
International Energy	—	—	—	—	243 D	—	243	243
Other	(645)	320 A	57 B	—	—	—	386	(259)
Intercompany Eliminations	1	—	—	—	—	(1)	(1)	—
Discontinued Operations	(618)	—	—	—	(263) D	662 E	419	—
Net Income Attributable to Duke Energy Corporation	\$ 2,152	\$ 320	\$ 57	\$ 45	\$ —	\$ 661	\$ 1,083	\$ 3,234
EPS ATTRIBUTABLE TO DUKE ENERGY CORPORATION, BASIC	\$ 3.11	\$ 0.48	\$ 0.08	\$ 0.07	\$ —	\$ 0.95	\$ 1.56	\$ 4.80

A - Net of \$194 million tax benefit. Includes \$11 million recorded within Operating Revenues, \$278 million recorded within Operating Expenses and \$234 million recorded within Interest Expense on the Consolidated Statements of Operations. The interest expense primarily relates to losses on forward-starting interest rate swaps associated with the Piedmont acquisition financing.

B - Net of \$35 million tax benefit. Primarily consists of severance costs recorded within Operation, maintenance and other on the Consolidated Statements of Operations.

C - Net of \$26 million tax benefit. Other-than-temporary impairment included within Equity in earnings (losses) of unconsolidated affiliates on the Consolidated Statements of Operations.

D - Net of \$37 million tax expense. Operating results of the International Disposal Group, which exclude the loss and impairment described below and other miscellaneous transaction-related costs, recorded within (Loss) Income from Discontinued Operations, net of tax on the Consolidated Statements of Operations.

E - Recorded within (Loss) Income from Discontinued Operations, net of tax on the Consolidated Statements of Operations. Includes a loss on the sale of the International Disposal Group, an impairment charge related to certain assets in Central America, and a tax benefit related to previously sold businesses.

Weighted Average Shares, Diluted (reported and adjusted) - 691 million

DUKE ENERGY CORPORATION
REPORTED TO ADJUSTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2015
 (Dollars in millions, except per-share amounts)

	Special Items										Total Adjustments	Adjusted Earnings
	Reported Earnings	Costs to Advance Bargains	Edwardport Settlement	Midwest Generation Operations	Ash-Booth Settlement and Penalties	Cost Savings Initiatives	International Energy Operations	Discontinued Operations				
SEGMENT INCOME												
Electric Utilities and Infrastructure	\$ 2,816	\$ —	\$ 10	\$ 0	\$ 11	\$ 10	\$ —	\$ —	\$ 79	\$ 2,894		
Gas Utilities and Infrastructure	73	—	—	—	—	—	—	—	—	73		
Commercial Renewable	82	—	—	—	—	1	—	—	1	83		
Total Reportable Segment Income	2,945	—	55	—	11	11	—	—	80	3,094		
International Energy	—	—	—	—	—	—	754	—	131	131		
Other	(230)	80	—	96	—	77	—	41	278	(23)		
Discontinued Operations	171	—	—	(50)	—	—	(104)	28	(171)	—		
Net Income Attributable to Duke Energy Corporation	\$ 2,916	\$ 80	\$ 55	\$ —	\$ 11	\$ 88	\$ —	\$ 119	\$ 330	\$ 3,182		
EPS ATTRIBUTABLE TO DUKE ENERGY CORPORATION, Basic	\$ 4.06	\$ 0.00	\$ 0.00	\$ —	\$ 0.02	\$ 0.13	\$ —	\$ 0.17	\$ 0.40	\$ 4.64		

A - Net of \$37 million tax benefit. \$35 million recorded within Operating Expenses and \$2 million recorded within Interest Expense on the Consolidated Statements of Operations.

B - Net of \$36 million tax benefit. \$35 million recorded within Intergovernmental charges and \$1 million recorded within Other Income and Expenses, net on the Duke Energy Indiana Consolidated Statements of Operations.

C - Net of \$53 million tax expense. Operating results of the nonregulated Midwest generation business classified as discontinued operations, which exclude special items and economic hedges.

D - Net of \$3 million tax benefit. Recorded within Operation, maintenance and other on the Consolidated Statements of Operations. Includes \$8 million and \$5 million at Duke Energy Carolina and Duke Energy Progress, respectively.

E - Net of \$6 million tax benefit. Primarily consists of severance costs recorded within Operation, maintenance and other on the Consolidated Statements of Operations. Includes \$7 million at Duke Energy Carolina, \$4 million at Duke Energy Progress, \$2 million at Duke Energy Florida, \$1 million at Duke Energy Ohio and \$2 million at Duke Energy Indiana.

F - Net of \$1 million tax benefit. Primarily consists of severance costs recorded within Operation, maintenance and other on the Consolidated Statements of Operations.

G - Net of \$47 million tax benefit. Primarily consists of severance costs recorded within Operation, maintenance and other on the Consolidated Statements of Operations.

H - Net of \$70 million tax expense. Operating results of the International Energy Group classified as discontinued operations.

I - State tax expense resulting from the completion of the sale of the nonregulated Midwest generation business.

J - Recorded in Income (Loss) from Discontinued Operations, net of tax on the Consolidated Statements of Operations, and includes the impact of a litigation reserve related to the nonregulated Midwest generation business.

Weighted Average Shares Outstanding, Diluted (reported and adjusted) - 694 million

DUKE ENERGY CORPORATION
ADJUSTED TO REPORTED EARNINGS RECONCILIATION
 Twelve Months Ended December 31, 2014
 (Dollars in millions, except per-share amounts)

	Special Items									
	Reported Earnings	Costs to Achieve Progress Marger	Asset Impairment	Liabilities Reserve	Asset Sales	International Tax Adjustment	Economic Hedges (Warr. to-Married)	Discontinued Operations	Total Adjustments	Adjusted Earnings
Net income (Loss) Attributable to Duke Energy Corporation	\$ 1,821	\$ 127	\$ 33	\$ 122	\$ 5	\$ 173	\$ 8	\$ 477	\$ 1,225	\$ 3,218
EPS ATTRIBUTABLE TO DUKE ENERGY CORPORATION, BASIC	\$ 2.96	\$ 0.19	\$ 0.54	\$ 0.18	\$ (0.01)	\$ 0.63	\$ 0.01	\$ 0.84	\$ 1.28	\$ 4.66

A - Net of \$15 million tax benefit. \$5 million recorded as a decrease in Operating Revenues; \$10 million recorded as the Operating Expenses and \$1 million recorded as the Interest Expense on the Consolidated Statement of Operations.

B - Net of \$1 million tax benefit. Recorded with Operating Revenues on the Consolidated Statement of Operations.

C - Net of \$35 million tax benefit. Recorded as impairment charges on the Consolidated Statement of Operations.

D - Recorded with Operating Maintenance and Other Operating Expenses on the Consolidated Statement of Operations.

E - Net of \$5 million tax expense. Recorded in Other Income and Expenses on the Consolidated Statement of Operations.

F - Deferred tax impact resulting from the decision to reclassify International Energy's historic and projected foreign earnings, included with Income Tax Expense on the Consolidated Statement of Operations.

G - Recorded in income (loss) from Discontinued Operations, net of tax on the Consolidated Statement of Operations, and was the impairment of the nonregulated Midwest generation business, the "mark-to-market" of economic hedges of the nonregulated Midwest generation business, state tax benefit resulting from the planned disposition and certain costs associated with a contract settlement.

Weighted Average Shares reported and adjusted - in millions

Basic	787
Diluted	787

"Mark-to-market" adjustments reflect the impact of derivative contracts, which are used in Duke Energy's hedging of a portion of the economic value of its commercial generation assets and also relate to existing derivative positions that may have reports beyond the planned disposal date of the nonregulated Midwest generation business. The mark-to-market impact of derivative contracts is recognized in GAAP earnings immediately as such derivative contracts do not qualify for hedge accounting or regulatory treatment. The economic value of generation assets is subject to fluctuations in fair value due to market price volatility of input and output commodities (e.g., coal, electricity, natural gas). Economic hedging involves both purchases and sales of these input and output commodities related to generation assets. Operations of the generation assets are accounted for under the accrual method. Management believes including impacts of mark-to-market changes of the derivative contracts from adjusted earnings (the settlement order matches the financial impact of the derivative contract with the portion of economic value of the underlying hedged asset). However, due to the structure of the nonregulated Midwest generation business as mentioned above, certain derivative positions have reports beyond the planned disposal date of these assets. As such, management has excluded settlements of these derivative positions from adjusted diluted EPS as these releases have and expect more closely relate to the cost in disposal of these assets. Management believes that the presentation of adjusted diluted EPS attributable to Duke Energy Corporation provides useful information to investors as it provides them an additional relevant comparison of Duke Energy Corporation's performance across periods.

DUKE ENERGY CORPORATION
ADJUSTED TO REPORTED EARNINGS RECONCILIATION
Twelve Months Ended December 31, 2013
(Dollars in millions, except per-share amounts)

	Reported Earnings	Special Items						Total Adjustments	Adjusted Earnings
		Costs to Achieve, Progress Merger	Nuclear Development Charges	Litigation Reserve	Crystal River Unit 3 Impairment	Asset Sales	Discontinued Operations		
Net Income (Loss) Attributable to Duke Energy Corporation	\$ 2,566	\$ 164 A	\$ 57 B	\$ 14 C	\$ 216 D	\$ (50) E	\$ (6) F	\$ 415	\$ 3,080
EPS ATTRIBUTABLE TO DUKE ENERGY CORPORATION, BASIC	\$ 3.77	\$ 0.26	\$ 0.08	\$ 0.02	\$ 0.31	\$ (0.07)	\$ (0.01)	\$ 0.59	\$ 4.36

A - Net of \$113 million tax benefit. \$57 million recorded as a decrease in Operating Revenues, \$350 million recorded within Operating Expenses and \$62 million recorded within Interest Expense on the Consolidated Statements of Operations.

B - Net of \$30 million tax benefit. Recorded within Impairment Charges (Operating Expenses) on the Consolidated Statements of Operations.

C - Net of \$8 million tax benefit. Recorded in Operations, maintenance, and other (Operating Expenses) on the Consolidated Statement of Operations.

D - Net of \$137 million tax benefit. \$2 millions recorded as a decrease in Operating Revenues and \$344 million recorded within Operating Expenses on the Consolidated Statement of Operations.

E - Net of \$31 million tax expense. Recorded in Other Income and Expenses on the Consolidated Statements of Operations and Gain/Loss on Sales of Other Assets on the Consolidated Statement of Operations.

F - Recorded in Income (Loss) From Discontinued Operations, net of tax, on the Consolidated Statements of Operations. Includes the impairment of the nonregulated Midwest generation business and the mark-to-market of economic hedges of the nonregulated Midwest generation business.

Weighted Average Shares (reported and adjusted) - in millions

Basic	706
Diluted	706

Duke Energy Corporation
Available Liquidity Reconciliation
As of June 30, 2020
(In millions)

Cash and Cash Equivalents	\$ 341
Less: Certain Amounts Held in Foreign Jurisdictions	(110)
Less: Unavailable Domestic Cash	(87)
	244
Plus: Remaining Availability under Master Credit Facilities and other facilities	5,892
Plus: Remaining Availability from Equity Forwards	2,579
Total Available Liquidity (a), June 30, 2020	\$ 8,715 approximately 8.7 billion

(a) The available liquidity balance presented is a non-GAAP financial measure as it represents Cash and cash equivalents, excluding certain amounts held in foreign jurisdictions and cash otherwise unavailable for operations, and remaining availability under Duke Energy's available credit facilities, including the master credit facility and available equity forwards as of June 30, 2020. The most directly comparable GAAP financial measure for available liquidity is Cash and cash equivalents.

Duke Energy Corporation
Operations, Maintenance and Other Expense
(In millions)

	Actual December 31, 2016	Actual December 31, 2017	Actual December 31, 2018	Actual December 31, 2019
Operation, maintenance and other ^(a)	\$6,223	\$5,944	\$6,463	\$6,066
Adjustments:				
Costs to Achieve Mergers ^(b)	(238)	(94)	(83)	—
Severance ^(c)	(92)	—	(167)	—
Regulatory settlement ^(c)	—	(5)	(40)	—
Reagents Recoverable ^(c)	(93)	(90)	(112)	(95)
Energy Efficiency Recoverable ^(c)	(417)	(485)	(446)	(415)
Other Deferrals and Recoverable ^(c)	(233)	(246)	(477)	(472)
Margin based O&M for Commercial Businesses	(185)	(94)	(113)	(95)
Short-term incentive payments (over/under budget)	(90)	(22)	(30)	(112)
Non-Rider Recoverable operation, maintenance and other	<u>\$ 4,875</u>	<u>\$ 4,908</u>	<u>\$ 4,974</u>	<u>\$ 4,878</u>

(a) As reported in the Consolidated Statements of Operations.

(b) Presented as a special item for the purpose of calculating adjusted earnings and adjusted diluted earnings.

(c) Primarily represents expenses to be deferred or recovered through rate riders.

FFO to Debt Calculation
Duke Energy Corporation
 (\$ in millions)

	Year Ended December 31,	
	2019	2018
	Actual	Actual
Cash From Operations	\$ 8,309	\$ 8,309
Adjust for Working Capital	250	250
Cash ARO spend	746	746
Include Capitalized Interest on cost	(159)	(159)
Hybrid interest adjustment	30	30
Preferred stock adjustment	(21)	(21)
CRS securitization adjustment	(34)	(34)
ACP construction loan interest adjustment	(32)	(32)
AMT refund adjustment (1)	(287)	(287)
Lease-imputed FFO adjustment (2)(3)	340	340
Funds From Operations	\$ 8,908	\$ 8,908
Notes payable and commercial paper	\$ 3,135	\$ 3,135
Current maturities of LT debt	3,141	3,141
LT debt	54,985	54,985
Less: Purchase Accounting adjustments	(1,912)	(1,912)
CRS securitization	(1,112)	(1,112)
Underfunded Pension	330	330
ACP construction loan	827	827
Hybrid debt adjustment	(250)	(250)
Preferred stock adjustment	1,000	1,000
Lease-imputed debt	1,640	1,640
Total Balance Sheet Debt (including ST)	\$ 61,690	\$ 61,690
Working capital detail, including MTLA		
Receivables	\$ 78	\$ 78
Inventory	(132)	(132)
Other current assets	30	30
Accounts payable	(164)	(164)
Taxes accrued	(224)	(224)
Other current liabilities	178	178
	\$ (230)	\$ (230)
FFO / Debt	14.4%	14.4%

(1) AMT refund adjustment is an expected 2020 cash inflow from the IRS related to AMT refunds that Duke Energy will receive as a result of the 2017 Tax Act. The 2020 AMT refund is included in the 2019 GAAP cash flow statement as deferred income taxes and change in other current assets. The change in other current assets is part of working capital, which is added back to the cash from operations. Therefore, the AMT refund adjustment is required to reduce cash from operations so there is no impact in 2019 for the 2020 expected AMT Refund.

In the 2018 Funds From Operations, a similar adjustment should have been made for the \$573 million AMT refund. Had the adjustment been made, the Funds From Operations would have been reduced by \$573 million. Starting in 2019 and going forward, receipts of the AMT refund will consistently be included in Funds From Operations in the year the cash is received.

I/A

FFO to Debt Calculation
Duke Energy Progress
(In millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	1,829
Adjust for Working Capital		(92)
Coal ash ARO spend		390
Include Capitalized Interest as cost		(28)
Lease-imputed FFO adjustment (DBA)		56
Funds From Operations	\$	2,149
Notes payable to affiliated companies	\$	66
Current maturities of LT debt		1,006
LT debt		7,902
LT debt payable to affiliates		150
Lease imputed debt		391
Total Balance Sheet Debt (including ST)	\$	9,515
Working capital detail, excluding MTH		
Receivables	\$	21
Receivables from affiliates		(29)
Inventory		30
Other current assets		101
Accounts payable		92
Accounts payable to affiliates		(75)
Taxes accrued		(46)
Other current liabilities		68
	\$	62
FFO / Debt		22.6%

FFO to Debt Calculation
Duke Energy Florida
(In millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	1,470
Adjust for Working Capital		(178)
Coal ash ARO spend		22
Include Capitalized Interest as cost		(3)
Adjust for CR3		(54)
Lease-imputed FFO adjustment (D&A)		79
FFO From Operations	\$	1,346
Notes payable to affiliated companies	\$	-
Current maturities of LT debt		571
LT debt		7,416
Adjust for CR3		(1,111)
Lease imputed debt		401
Underfunded Pension		77
Total Balance Sheet Debt (including ST)	\$	7,364
Working capital detail, excluding MTM		
Receivables	\$	26
Receivables from affiliates		17
Inventory		42
Other current assets		156
Accounts payable		(36)
Accounts payable to affiliates		40
Taxes accrued		(31)
Other current liabilities		(26)
	\$	170
FFO / Debt		18.3%

FFO to Debt Calculation
Duke Energy Indiana
(In millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	997
Adjust for Working Capital		2
Coal ash ARO spend		48
Include Capitalized Interest as cost		(26)
Lease-imputed FFO adjustment (DLA)		18
Funds From Operations	\$	1,039
Notes payable to affiliated companies	\$	30
Current maturities of LT debt		503
LT debt		3,404
LT debt payable to affiliates		150
CRC		186
Lease imputed debt		58
Total Balance Sheet Debt (including ST)	\$	4,331
Working capital detail, excluding MTM		
Receivables	\$	(8)
Receivables from affiliates		41
Inventory		(95)
Other current assets		76
Accounts payable		(10)
Accounts payable to affiliates		4
Taxes accrued		(25)
Other current liabilities		15
	\$	(2)
FFO / Debt		24.0%

I/A

FFO to Debt Calculation
Duke Energy Ohio
(in millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	\$36
Adjust for Working Capital		(19)
Cost Ash ARO spend		8
Include capitalized interest as cost		(22)
Lease-imputed FFO adjustment (D&A)		10
Funds From Operations	\$	\$08
Notes payable to affiliated companies	\$	312
Current maturities of LT debt		-
LT debt		2,594
LT debt payable to affiliates		25
CRC		165
Lease imputed debt		22
Total Balance Sheet Debt (including ST)	\$	3,118
Working capital detail, excluding MTM		
Receivables	\$	20
Receivables from affiliates		22
Inventory		(9)
Other current assets		(5)
Accounts payable		(17)
Accounts payable to affiliates		(10)
Taxes accrued		17
Other current liabilities		1
	\$	28
FFO / Debt		16.1%

I/A

FFO to Debt Calculation
Piedmont Natural Gas
(In millions)

	Year Ended December 31,	
	2019	
	Actual	
Cash From Operations	\$	409
Adjust for Working Capital		68
Include Capitalized Interest as cost		(26)
Lease-imputed FFO adjustment (D&A)		4
Funds From Operations	\$	475
Notes payable to affiliated companies	\$	475
Current maturities of LT debt		-
LT debt		2,384
Lease imputed debt		27
Total Balance Sheet Debt (including GT)	\$	2,887
Working capital detail, excluding MTM		
Receivables	\$	28
Receivables from affiliates		12
Inventory		(2)
Other current assets		(25)
Accounts payable		(7)
Accounts payable to affiliates		(35)
Taxes accrued		(60)
Other current liabilities		1
	\$	(81)
FFO / Debt		16.5%

Duke Energy

Upgrading to Buy: Setting a new, more positive tone in the Carolinas

Rating Change: BUY | PO: 85.00 USD | Price: 80.73 USD

Coal ash pending with tide beginning to shift favorably

With DUK shares trading near its relative lows (-1% vs. XLU since 2Q call & more critically a full -110% discount vs the group) we are upgrading to Buy as we perceive a de-risked story acute fears reflected. We see real reason for an inflection in EPS expectations with both positive regulatory backdrop on '21 legislation & positive revisions to IRP capex (based on forthcoming reaction from NC gov/NCUC). While pending coal ash rate case remains outstanding (and much anticipated cautious point), we perceive an order similar to Dominion as quite likely (after latest stakeholder discussions); this would help firm up doubtful expectations. Further, we anticipate existing settlements in the rate case to remain intact despite concerns otherwise too. Fears are likely at their worst heading into 4Q decisions in NC – and see positive EPS & regulatory datapoints arising into '21. Expectations appear to at their low point & investors seem to be missing the positive inflection from regulatory work DUK has been pursuing. Bottom line, analyst EPS expectations of ~\$5.40 on '22 likely understate potential +\$14 Bn in higher capex possible (tables below) & repositioned ESG trajectory.

Sizing up the IRP & Clean Energy Rec.; Tweak EPS higher

Given the recently filed IRP likely gravitating toward the 70% CO₂ reduction scenario with high wind/base hybrid w/ stakeholders (not the 'base plan'), we assume \$1bn of incremental spend in the initial 5yr window vs. \$56bn base plan for T&D interconnect opportunities. This incremental spend moves EPS modestly higher, now forecasting a 5.6% CAGR off the re-based '21 outlook. We perceive the latter 5-10yr window will provide the more meaningful generation spend opportunity (see analysis below) w/ upwards of \$14bn over a 15yr window (including Trans.) w/ DUK's utility renewable ownership assumed at 30% (similar to HB589) given potential concessions on ownership in exchange for accelerated D&A/securitization through the clean energy process. We also apply a 2x premium to DUK's FL ops given constructive regulatory backdrop and 0.5x premium to DEP/DEC due to spending upside. Our PO moves to \$85 (from \$87) on lower peer multiples of 16.5x for electric (from 17.3x) and 14.5x (from 16.4x) for gas.

Estimates (Dec)

(US\$)	2018A	2019A	2020E	2021E	2022E
EPS	4.72	5.06	5.07	5.20	5.44
GAAP EPS	4.69	5.12	5.15	5.28	5.51
EPS Change (YoY)	3.3%	7.2%	0.2%	2.6%	4.6%
Consensus EPS (Bloomberg)			5.08	5.24	5.49
DPS	3.64	3.78	3.85	3.84	3.95

Valuation (Dec)

	2018A	2019A	2020E	2021E	2022E
P/E	17.1x	16.0x	15.9x	15.5x	14.8x
GAAP P/E	17.2x	15.8x	15.7x	15.3x	14.7x
Dividend Yield	4.5%	4.7%	4.8%	4.8%	4.9%
EV / EBITDA*	16.7x	14.4x	13.5x	12.7x	12.0x
Free Cash Flow Yield*	-3.7%	-3.4%	-2.5%	-1.5%	-2.9%

* For full definitions of /Qmethod™ measures, see page 13.

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12187019

Timestamp: 09 September 2020 06:06AM EDT

09 September 2020

Equity

Key Changes

(US\$)	Previous	Current
Inv. Opinion	B-2-7	B-1-7
Inv. Rating	NEUTRAL	BUY
Price Obj.	87.00	85.00
2022E Rev (m)	28,190.8	28,209.5
2022E EPS	5.43	5.44

Julien Dumoulin-Smith

Research Analyst
BofAS
+1 646 855 5855
julien.dumoulin-smith@bofa.com

Richard Ciciarelli, CFA

Research Analyst
BofAS
richard.ciciarelli@bofa.com

Harris Pollans

Research Analyst
BofAS
harris.pollans@bofa.com

Aric Li

Research Analyst
BofAS
aric.li@bofa.com

Anya Shelekhin

Research Analyst
BofAS
anya.shelekhin@bofa.com

Ryan Greenwald

Research Analyst
BofAS
ryan.greenwald@bofa.com

Dariusz Lozny, CFA

Research Analyst
BofAS
dariusz.lozny@bofa.com

Stock Data

Price	80.73 USD
Price Objective	85.00 USD
Date Established	9-Sep-2020
Investment Opinion	B-1-7
52-Week Range	62.13 USD - 103.79 USD
Mkt Val (mn) / Shares Out	59,371 USD / 735.4 (mn)
Average Daily Value (mn)	264.33 USD
BofA Ticker / Exchange	DUK / NYS
Bloomberg / Reuters	DUK US / DUK.N
ROE (2020E)	7.6%
Net Dbt to Eqty (Dec-2019A)	129.8%

NCUC – North Carolina Utility
Commission

iQprofileSM Duke Energy

iQmethodSM – Bus Performance*

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Return on Capital Employed	3.3%	3.9%	3.9%	4.0%	4.0%
Return on Equity	6.2%	8.2%	7.6%	7.6%	7.6%
Operating Margin	19.1%	22.8%	23.0%	23.5%	24.0%
Free Cash Flow	(2,203)	(2,003)	(1,499)	(865)	(1,704)

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Cash Realization Ratio	2.7x	2.7x	2.5x	2.5x	2.4x
Asset Replacement Ratio	2.0x	2.6x	2.2x	2.1x	2.1x
Tax Rate	14.6%	12.7%	12.0%	12.0%	12.0%
Net Debt-to-Equity Ratio	130.8%	129.8%	120.4%	121.0%	124.2%
Interest Cover	2.5x	2.9x	3.0x	3.0x	3.0x

Income Statement Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Sales	24,521	25,079	26,359	27,307	28,210
% Change	4.1%	2.3%	5.1%	3.6%	3.3%
Gross Profit	10,441	11,556	12,276	12,978	13,724
% Change	-3.5%	10.7%	6.2%	5.7%	5.7%
EBITDA	8,848	10,261	10,948	11,633	12,364
% Change	-4.7%	16.0%	6.7%	6.3%	6.3%
Net Interest & Other Income	(2,094)	(2,204)	(2,224)	(2,281)	(2,406)
Net Income (Adjusted)	2,666	3,707	3,719	3,979	4,191
% Change	-12.8%	39.0%	0.3%	7.0%	5.3%

Free Cash Flow Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Net Income from Cont Operations (GAAP)	2,647	3,755	3,779	4,039	4,251
Depreciation & Amortization	4,696	4,548	4,876	5,212	5,581
Change in Working Capital	0	(53)	(95)	(77)	(78)
Deferred Taxation Charge	1,079	1,260	1,100	1,000	400
Other Adjustments, Net	(1,236)	319	(188)	(200)	24
Capital Expenditure	(9,389)	(11,832)	(10,971)	(10,840)	(11,882)
Free Cash Flow	-2,203	-2,003	-1,499	-865	-1,704
% Change	-55.4%	9.1%	25.1%	42.3%	-96.9%

Balance Sheet Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Cash & Equivalents	591	590	675	760	1,047
Trade Receivables	3,134	3,183	3,297	3,381	3,461
Other Current Assets	5,989	5,958	6,100	6,153	6,171
Property, Plant & Equipment	91,694	98,650	104,745	110,373	116,674
Other Non-Current Assets	43,984	43,984	43,984	43,984	43,984
Total Assets	145,392	152,366	158,801	164,651	171,337
Short-Term Debt	6,816	7,167	7,350	7,751	8,286
Other Current Liabilities	8,225	8,190	8,351	8,411	8,431
Long-Term Debt	51,123	53,776	55,151	58,159	62,176
Other Non-Current Liabilities	35,394	35,761	35,633	35,493	35,577
Total Liabilities	101,558	104,894	106,485	109,814	114,471
Total Equity	43,834	46,498	51,342	53,863	55,892
Total Equity & Liabilities	145,392	151,392	157,827	163,677	170,363

* For full definitions of iQmethodSM measures, see page 13.

Company Sector

Electric Utilities

Company Description

Duke Energy Corporation operates as a regulated utility company in the US based in Charlotte, NC. The company operates regulated electric utilities in the Midwest, Florida and the Carolinas and supplies electric service to approximately 7.5 million residential, commercial, and industrial customers. Duke owns 50,000MW of capacity. The regulated gas utilities serve more than 1.6 million customers in the Carolinas and Ohio. A commercial arm owns contract renewables and pipelines across the US.

Investment Rationale

We rate DUK Buy as we see LT growth as intact despite years of negative revisions, by contrast, we see likely de-risking of regulatory compact into '21 legislative session alongside improving capex budget from accelerated coal retirements (beyond base plan presented) as enabling one of few positive inflections in EPS estimates in recent years. Opportunity to re-rate off exceptionally low expectations vs peers.

Stock Data

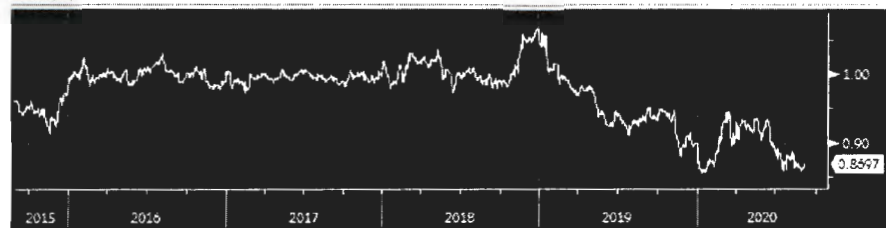
Average Daily Volume 3,242,689

Quarterly Earnings Estimates

	2019	2020
Q1	1.24A	1.14A
Q2	1.12A	1.08A
Q3	1.79A	1.82E
Q4	0.93A	1.03E



Exhibit 1: DUK FY2 PE vs. IXU



Source: Bloomberg

We upgrade DUK shares as we perceive few negatives remaining for shares after a consistent set of pressures in recent years. While the most cautious of which could still materialize (formally) around its rate case, we perceive management has effectively risk-adjusted its recently reduced EPS guidance with 2Q. We perceive that this reset effectively addressed many of the legacy issues. With expectations just so low, we perceive very little in the form of a positive as necessary to drive a re-rate in shares higher. For instance, in our case, simple affirmation of coal ash precedent utilized in the Dominion rate case for Duke would be sufficient (appears quite likely following recent discussions with stakeholders). With Street still seemingly concerned of further reductions to '21 EPS (we don't believe that sell-side expectations have re-rated alongside investor expectations re-rate down to new lower 4-6% CAGR)- we just don't believe those will materialize. By contrast, we see positive capex revisions at its upcoming ESG Analyst Day on October 9th as enabling among the few positive EPS revisions of late. Moreover, we see substantially greater traction for meaningful regulatory reform and for a more aggressive adoption of renewables capex post-election as well. 2021 looks set to see a meaningfully improved backdrop for DUK considering the various potential outcomes of 'another' shot at legislation (this time, with what seems like a meaningfully improved set of stakeholders supporters). Prospects such as multi-year rate plans (to avoid consecutive cases), ROE banding, and performance based rates (PBR) all appear quite possible.

But what is the peer set – quite low on expectations despite historically intact outlook for utilities?

While DUK has suffered a series of regulatory losses over the past year, including the cancelation of Atlantic Coast, excavation order from the DEQ, and potential absence of return on coal ash spending (once past the deferral period) from the pending rate cases, we perceive the company's risk profile and business mix to be in much better shape than other peers that trade a similar discount to the group. We see risks associated with the rate case as manageable despite the recent pushback on grid mod as we see approval as likely and see risks with coal ash as largely priced-in (reflecting the incremental regulatory lag in our assumptions). While the ruling from the Supreme Court will likely dictate recovery of coal ash going forward (presenting modest downside risk), we expect the commission will largely take their cues from the recent Dominion order.

With shares now nearly de-risked in our view (absent the pending coal ash outcome), we perceive a signal of confidence in NC could stem from the IRP outcome and (inaugural?) ESG day on Oct. 9 (where we expect mgmt. to highlight 2-3 scenarios from the IRP most likely to take hold as well as more granular capex details associated with them). Moreover, we see stakeholder alignment associated with the Clean Energy Agenda where we could see several constructive rate making proposals move forward, including: Multi-year rate plans (MYRP), decoupling, accelerated depreciation, and/or legislative changes around the least cost approach in the IRP (to open up more renewable opportunities). Bottom line, we perceive DUK's EPS quality to not be materially different from peers that trade at higher levels with clear upside to the story if the company can execute on the NC pivot.



So what is the real risk here that isn't fully appreciated?

We stress the next date the Supreme Court can issue a decision for the 2017 coal ash appeal is Sept. 25 (or if not in Dec.), and with no statutory time frame on a rate case decision it could be conceivable that the NCUC receives its cues from the higher court. Still given precedent from the D order and commentary from hearings, we see a 10yr amortization and no return on past the deferral period as base case w/ 6-8c impact reflected in our EPS estimates. We stress Supreme Court doesn't need to follow any earlier precedent but would still expect some form of return on equity – we see the earlier NCUC decision as an elegant solution to addressing even brief periods of return on coal ash (and full recovery of associated principle). There is no mandated timeline to address this case (having been pending for some time). Bottom line, we perceive some potential for modestly reduced EPS here as the principle remaining risk – this doesn't appear necessarily likely (focus of courts will be on legalities rather than ratepayers outcomes of what total amount is eligible for recovery)– and as such as see positives on balance as outweighing risks in near-term for our upgrade.

Incremental capex opportunities w/ recent IRP filing

We continue to expect Duke's capex outlook to be reset higher with the company's 2020 Integrated Resource Plan (IRP) that was filed September 1st. DUK outlined six paths to achieve the realization of cleaner energy in both NC and SC encapsulating the company's goal of 50% carbon emissions reductions by 2030 across all of the six options, and two of the options were aligned with the NC governor's carbon emission reduction goal of 70% by 2030. The IRP's base case without carbon policy is mostly in line with the company's 2018 IRP except for an incremental 500 MW of storage + 250MW of solar largely offset by 1,400 MW less new gas gen (9,600 MW vs prior 11,000 MW). All of the other 2020 IRP options aside from this base case imply incremental capex upside to the current \$56bn 5-yr plan (2020-2024) in addition to substantial incremental investment in the subsequent five years (2025-2029). See our recent update following the IRP filing here: [DUK: When Base Doesn't Quite Seem like the Base Plan](#).

This IRP was broader than usual, as the commission will look for a reasonable balance between the lowest cost plan for customers and maximizing de-carbonization efforts. Hence, the multiple scenarios allow for flexibility, providing the commissions and stakeholders a number of options when weighing in on the plan that is most aligned with both customers and de-carbonization targets. We see this as a politically astute move, albeit the immediate reaction may indeed prove less immediately constructive by investors who may not fully appreciate the positioning of this document. Note only in SC is the IRP explicitly approved or rejected, while a process is opened up in NC with interveners opining. We could see the IRP approval process kicked to the 2022 IRP filing given most generation needs are not likely to occur near-term, although see the 2020 IRP setting the stage for this.

Just what is the capex opportunity?

Given the IRP is an adjudicated process and the Clean Energy Plan reaches the Governor at the end of December, we assume a more formal detailed capex update is not likely to occur until 4Q20 results in February 2021. We do highlight that Duke will be hosting an inaugural ESG day on October 9 to provide more details around three of the six options outlined in the IRP that have the most stakeholder interest (i.e. most likely). *The base plan without carbon policy is the lowest cost planning scenario and in line with the current 5-yr plan. Hence, this does not imply any upside to the current 5-yr capital program. The options that aligned with the governor's 70% carbon reduction target along with the no new gas option implies incremental capex relative to the \$56bn plan through '24 (albeit with most opportunities occurring in the latter half of the decade).* We expect most for the renewable CPCN's will likely be filed 3yrs out from the expected in-service date, with most of the coal replacement capacity build to occur from '25-30 time frame, although could see T&D opportunities potentially accelerated (given limitations on solar without meaningful investments to alleviate congestions). Note three of the six scenarios leave

zero remaining dual fuel coal capacity by 2035 while the two base cases with and without carbon policy leave 3,050 MW of Dual Fuel coal capacity post 2035 and the “no new gas generation” leaves 2,200 MW remaining post 2035. Below we lay out the economic retirement dates of coal plants where it is clear the bulk of the retirements occur during 2025-2035, which is likely aligned with much of the necessary renewable capex to replace the retired coal capacity.

Table 1: Economic Retirement dates of coal plants from Sequential Peaker Method (SPM)

Coal Plant	Base Case with or without CO2 Policy:	
	Most Economic Retirement Year	Capacity (MW)
Allen 2-4	2022	677
Allen 1 & 5	2024	421
Cliffside 5	2026	526
Roxboro 3 & 4	2028	1,409
Roxboro 1 & 2	2029	1,053
Mayo 1	2029	746
Marshall 1-4	2035	2,078
Belews Creek 1	2039	1,110
Belews Creek 2	2039	1,110
Cliffside 6	2049	830
Total Incremental Retirements 2020-2024 (MW)		1,098
Total Incremental Retirements 2025-2029 (MW)		3,734
Total Incremental Retirements 2030-2035 (MW)		2,078
Total Incremental Retirements beyond 2035 (MW)		3,050

Source: BoFA Global Research estimates, company report, Bloomberg

We also assume DUK will only be able to own 30% of utility-scale renewables (specifically solar and wind) as a starting point given precedent from HB589 for solar. We also conservatively assume DUK will only own 30% of storage but acknowledge upside to this assumption. We stress the timing/pace, type of renewable deployment (solar/storage, wind, offshore, standalone storage, nat gas), and total amount that DUK can own will very much be dictated by the Clean Energy stakeholder process and general assembly/governor elections. Lastly, we assume DUK owns 100% of the associated T&D. In total, we could see upwards of \$14bn in capex (including Transmission although absent distribution) over a 15yr period based on our various assumptions below. Below we breakdown this hypothetical renewable capex opportunity by using the base plan without carbon policy as the low end of the range and the 70% CO2 reduction; High Wind Plan as the high end of the range. Recall, the Base without carbon policy is roughly in line with the current long term plan and incorporates absolute least cost planning. After speaking with a number of stakeholders, the 70% Carbon Reduction; High Wind plan seems to be aligned with the interests of most of the parties, particularly Governor Cooper's 70% carbon emission reduction target. We expect the Duke's final plan to shake out somewhere between these two pathways with the average implied incremental capex over the next 15 years relative to the current plan to be about \$7bn (including T&D).

Table 2: DUK Hypothetical Renewable Capex Opportunity stemming from the IRP process

DUK Hypothetical Renewable Capex Calc	Base without CO2 Policy Low	70% CO2 Reduction; High Wind High
SOLAR		
Solar MW	250	7,850
% Ownership Assumption (Solar)	30%	30%
Owned Solar MW	75	2,355
\$/kw	1,200	1,200
Solar Capex Net to DUK (\$mn)	90	2,826
ONSHORE WIND		
Wind (MW)	0	2,850
% Ownership Assumption (Wind)	30%	30%
Owned Wind MW	0	855
\$/kw	1,500	1,500
Wind Capex Net to DUK (\$mn)	0	1,283
OFFSHORE WIND		
Offshore Wind (MW)	0	2,650
% Ownership Assumption (Offshore)	30%	30%
Owned Wind MW	0	795
\$/kw	3,000	3,000
Offshore Wind Capex Net to DUK (\$mn)	0	2,385
STORAGE		
Storage MW	500	3,850
% Ownership assumption (storage)	30%	30%
Storage MW	150	1,155
\$/kW	4,000	4,000
Storage Capex Net to DUK (\$mn)	600	4,620
NATURAL GAS		
Natural Gas (MW)	-1,400	-4,600
% Ownership Assumption (Nat Gas)	100%	100%
Natural Gas MW	-1,400	-4,600
\$/kw	1,000	1,000
Nat Gas Capex Net to DUK (\$mn)	-1,400	-4,600
TOTAL		
OWNED MW	225	5,160
Total MW	-650	12,600
Implied \$/kW on Owned Renewables	3,067	2,154
Total Renewable Capex Net to DUK(\$mn)	690	11,114
Total Renewable T&D Capex net to DUK (\$mn)	1,000	7,500
Less: Lower Nat Gas Capex Net to DUK (\$mn)	-1,400	-4,600
Incremental Capex net to DUK 2020-2035 (\$mn)	290	14,014
Avg Incremental Capex net to DUK 2020-2035 (\$mn)		7,152

Source: BoFA Global Research estimates, company report

North Carolina Offshore wind considerations

Avangrid Renewables won the Kitty Hawk offshore wind area bid from the federal government to lease 122,405 offshore acres off the coast of North Carolina and Virginia, and has begun the process of studying the area as part of early stage project development. Early indications are the Wind Energy Area (WEA) has potential to yield around 2.5GW of offshore wind. This compares to two of Duke's six pathways outlined in the 2020 IRP ("70% CO2 reduction; High Wind" and "No New Gas Generation"), which both call for 2,650 MW of offshore wind.

With North Carolina stakeholder discussions noting that there is a growing interest in offshore wind, we wonder if DUK could potentially partner with AGR or move further down to the southern portion of the state where a lease has not yet been opened yet. Mgmt. highlighted on its 2Q call, that the IRP could provide some visibility into this opportunity. Below, we assume just 20% of capacity would be replaced with offshore wind, with DUK having a 30% carve out of that amount.

Rate Case Expectations: coal ash Dominion order likely

We continue to expect DUK's rate case in the Carolinas to have a similar outcome to Dominion's coal ash order with a 10yr amortization period and no return once past the



deferral period. Recall, the key issues which Duke and the other parties have not reached a settlement on include: matters related to the recovery of and on coal ash basin expenditures in addition to the amount of annual depreciation expense, including accelerated depreciation on certain coal-fired generation plants.

We perceive testimony from CFO, Steve Young, was much stronger in response to some of the staff questioning. Specially, DUK's CFO pointed to the need for a strong credit rating due to the company's hurricane prone service territory (w/ sizeable storm costs still on its books), its need to operate its nuclear plants and access cheap capital, as well as the long-term implications that would result from a credit downgrade (given minimal impact on interest rates costs from a downgrade w/ all rates depressed due the fed backing of treasuries). Further, company testimony pointed out that its service territories in IN and FL receive a return on and of capital for coal ash spend as well as DUK's large-cap peers (SO, AEP, D in VA).

While commissioners did not provide any commentary one way or another, our base case coal ash outcome is in line with D's precedent, and we already reflect this in our estimates with ~30bps of lag in the out years ('23 and beyond) as we expect Duke will offset most of the lag next year and into '22 with cost mitigation. This translates to ~6-8c of drag per year vs mgmt. estimates of 5-10c/yr. We stress that with the next date the Supreme Court can issue a decision for the 2017 coal ash appeal is Sept. 25 (or if not in Dec.) and with no statutory time frame on a rate case decision, it could be conceivable that the NCUC waits for an order until it receives its cues from the higher court. The pending order from the Supreme Court remains largely unknown/cautious although see risks of the negative revisions priced-in/largely known and likely to set the precedent for future recovery and put the issue to bed once and for all.

Expect grid mod settlement to be approved despite recent pushback

Following the recent select Commissioner pushback on Duke's grid-improvement plan (GIP or grid-mod), we wanted to clarify this pushback and also make sure to note the positive tone the following day (Aug 28) supporting the previously settled items. Recall, on July 31, 2020, pursuant to the stipulations, DEC, DEP and the Public Staff agreed to total deferral treatment for about \$1.3bn of grid improvement projects i.e. GIP (vs \$2.4bn total requested) as part of their multifaceted partial settlement (see [here](#) for our report on DEC/DEP partial settlement including other terms). In the hearings, three Commissioners seemed to raise the concern around the GIP settlement including: McKissick, Clodfelter and Duffley. Duke noted that if the company did not receive the deferral, it would experience >100bps ROE impact by 2022 (third year of the GIP). Most of these commissioners' concern was around the lack of clarity with regard to determining whether or not the GIP was actually achieving its goals and aligning benefit/costs with customers accordingly. Specifically, there was concern with the significant percentage of GIP program costs allocated to residential customers while a very large percentage of the benefits flows to C&I customers.

However, Duke made clear in the Aug 28 hearing that when you back out the costs not associated with reliability (37% of the costs), 92% of the costs associated with reliability benefits are allocated to customers on the self-optimizing grid, which are all residential. Hence, residential customers bear the higher allocation of GIP program costs, but also receive the most benefit from a reliability standpoint. Lastly, we would highlight also on August 28th, it is emphasized by Mr. Ledford from the NCSEA that expert witnesses Paul Alvarez and Dennis Stephens, who previously had reservations about GIP and actually originally recommended to reject the GIP, now support the settlement for the pared down GIP – a positive sign that Duke notes reflects the value of stakeholder engagement. We note our conversation with stakeholders indicated a much improved proposal vs. the one just 3yrs ago. Bottom line, despite the pushback we believe the GIP settlement is likely approved by the commission and look for additional data points on hearings this week and beyond.



Alternative rate making mechanisms in legislation next?

We continue to perceive an opportunity for alternative rate mechanisms to move forward, such as Performance Based Rates (PBRs), Multi-year rate plans (MYRPs), ROE banding, securitization/accelerated depreciation, riders and others. We believe there remains potential for Duke to have a recommendation back to the legislation that would include some type of combination of these alternative mechanisms. All of these tools would be positive for Duke, but there are a number of steps it will take to get there as past efforts stalled/failed. With that said, we see both increased confidence from the company and corresponding stakeholder commentary as supportive for DUK's legislative prospects in the 2021 long session, although wouldn't be implemented in a rate case until 2023. Moreover, we don't perceive mgmt.'s updated growth trajectory relies on any one of these items in particular, although do see ability to garner a constructive outcome as further de-risking the EPS outlook.

What about the SE Energy Market?

Several Southeastern utilities (DUK, SO, D) announced that they are exploring the creation of a regional, intra-hour energy exchange called the Southeast Energy Exchange Market (SEEM). This comes after years of a contemplated Southeast regional transmission operator. While the ultimate hopes are that it could be an initial step towards reducing customer bills and other proposals have been more extreme (such as retail de-regulation), *we perceive an initial stumbling block could be the way in which DUK/SO proposed the market rather than through a stakeholder process.* Initial indication from the utilities is that it could save rate payers \$40mn/yr compared to a consultant study that suggested up to \$360bn in savings. While discussions remain in its infancy, we perceive there could be more pushback/skepticism/debate over which reforms ultimately take shape.

FL regulatory construct remains sound

Duke Energy Florida is proposing to spend ~\$1bn on 750 MW of solar projects across Florida in the next three years with ~\$500mn incremental vs. what is currently expected to be spent in FL. Given both the incremental spend opportunities and constructive regulatory backdrop where the company has the ability to garner another Multi-year rate plan (filing expected at end of 2021) and has above-average ROEs, we move to a 2x (from 1x) premium in this jurisdiction.

EPS Estimates

We raise our EPS assumptions modestly in '22-'25, and our implied EPS CAGR '25 is 60bps above the mid-point at 5.6% (off the \$5.15 base) as we factor in incremental capex from IRP at DEC and DEP. While our EPS estimates remain below consensus, we perceive the outlook to be de-risked as mgmt. can likely execute at the upper-end of the re-based 4-6% CAGR. While we remain -5c below formal Street estimates, we perceive investor expectations are already using at or below revised guidance midpoint suggesting closer to ~\$5.40 mark on '22 expectations. We perceive positive capex revisions alongside confidence in mgmt's ability to hold the line on costs into '21 & '22 should enable a consistent earned ROE trend in the Carolinas to drive this outcome. Moreover, mgmt. has been quite diligent in tactfully avoiding equity after its latest ACP pipeline setback – and perceive at least for now no further equity announcements as also helping to de-risk the backdrop.

Table 3: DUK EPS Estimates

EPS Estimates	2019A	2020E	2021E	2022E	2023E	2024E	2025E
Electric							
Carolinas	1.95	1.90	1.86	1.92	1.97	2.06	2.15
Indiana	0.60	0.61	0.62	0.64	0.66	0.68	0.71
Ohio - Electric	0.22	0.25	0.25	0.27	0.30	0.35	0.39
Progress- Carolinas	1.12	1.15	1.17	1.22	1.25	1.27	1.31
Progress- Florida	0.96	0.97	1.02	1.03	1.05	1.08	1.09
Commercial Transmission	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eliminations	-0.04	0.00	0.00	0.00	0.00	0.00	0.00
Consolidated Earnings	4.81	4.88	4.92	5.07	5.24	5.44	5.65
Guidance	4.77	4.94					
Gas							
Ohio - Gas	0.12	0.14	0.16	0.19	0.20	0.21	0.22
Piedmont (PNY)	0.27	0.31	0.33	0.37	0.41	0.45	0.49
Midstream Pipelines	0.24	0.11	0.04	0.05	0.06	0.08	0.09
Eliminations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consolidated Earnings	0.62	0.56	0.53	0.61	0.67	0.74	0.81
Guidance	0.51	0.72					
Commercial Renewables	0.27	0.32	0.33	0.30	0.28	0.29	0.22
Guidance	0.32	0.33					
Parent/Other	-0.64	-0.69	-0.58	-0.54	-0.46	-0.42	-0.28
Guidance	-0.60	-0.73					
Adjustments							
BofAe EPS	5.07	5.07	5.20	5.44	5.72	6.04	6.39
Previous Estimates	5.06	5.07	5.20	5.43	5.71	6.02	6.36
Guidance	4.95-5.15	5.05-5.45					
Consensus	5.02	5.08	5.24	5.49	5.84	6.20	7.04
Mgmt EPS CAGR: 4-6% from 2019-2024E (old)	5.00	5.25	5.51	5.79	6.08	6.39	
Low End	4.80	5.05	5.41	5.62	5.85	6.08	
High End	5.20	5.45	5.62	5.96	6.31	6.69	
BofAe CAGR '19-'24e						3.9%	
Mgmt EPS CAGR: 4-8% off '21 expected \$5.15 base (new)			5.15	5.41	5.68	5.96	6.26
Low End				5.36	5.57	5.79	6.02
High End				5.46	5.79	6.13	6.50
BofAe CAGR '21-'25e							5.6%

Source: BofA Global Research estimates, company report, Bloomberg

Valuation

Our PO moves to \$85 (from \$87) on lower 22E peer multiples (disc. back one yr) of 16.5x for electric (from 17.3x) and 14.5x (from 16.4x) for gas and more than offset our modestly higher EPS estimates. . We also apply a 2x premium to DUK's FL ops given constructive regulatory backdrop and 0.5x premium to DEP/DEC due to spending upside. We perceive a potential inflection heading into '21 off de-risked rate case outlook subsequent to full NCUC decision on case & coal ash recovery. We perceive the reduced outlook already reflects an eventual normalization in earned returns & regulatory outcomes. We perceive a continued clear potential for positive revisions with capex articulated – and subsequently into the capex process too will further drive confidence in shares. We see potential higher re-rating after several years of more cautious EPS revisions & datapoints. With its peer Dominion having been able to re-rate positively on ESG-related datapoints in recent months, we see its peer set as enabling a positive revision all the more as it meaningfully accelerates its coal retirements (likely) as NC executive & legislature more formally tackle energy issues in coming year.



Table 4: DUK SOTP Valuation

Duke Energy Sum of the Parts Valuation

2022E

All figures in \$Mn except per share

	Metric	P/E Multiple						Equity Value		
		2022 EPS	Low	Peer	Prem/Discount	Base	High	Low	Base	High
Group Peer Multiple - Electric		-	-	16.6x	-	-	-	-	-	-
Group EPS '18-'22 CAGR - Electric		-	-	5.00%	-	-	-	-	-	-
Electric Utilities		-	-	17.3x	-	-	-	-	-	-
Duke Energy Carolinas	\$1.92	16.8x			0.5x	17.8x	18.8x	\$32.24	\$34.15	\$36.07
Duke Energy Progress/Carolinas	\$1.22	16.8x			0.5x	17.8x	18.8x	\$20.48	\$21.70	\$22.92
Duke Energy Florida	\$1.03	18.3x			2.0x	19.3x	20.3x	\$18.81	\$19.83	\$20.86
Duke Energy Indiana	\$0.64	17.3x			1.0x	18.3x	19.3x	\$11.00	\$11.64	\$12.27
Duke Energy Ohio/Kentucky	\$0.27	16.3x			0.0x	17.3x	18.3x	\$4.42	\$4.69	\$4.96
Total Electric Utility Value	\$5.07							\$86.95	\$92.02	\$97.08
Group Peer Multiple - Gas				14.5x						
Group EPS '18-'22 CAGR - Gas				5.10%						
Gas Utilities	2022 EPS			15.2x						
Duke Energy Piedmont	\$0.37	14.2x			0.0x	15.2x	16.2x	\$5.27	\$5.64	\$6.01
Duke Energy Ohio/Kentucky Gas	\$0.19	14.2x			0.0x	15.2x	16.2x	\$2.66	\$2.84	\$3.03
Total Gas Utility Value	\$0.56							\$7.92	\$8.48	\$9.04
Commercial Segment	2022 EBITDA									
Remaining Midstream assets	\$107	8.0x		9.0x	0.0x	9.0x	10.0x	859	967	1,074
Transmission Segment	\$6	8.0x		9.0x	0.0x	9.0x	10.0x	52	58	64
Segment Net Debt	-\$3,623							-3,623	-3,623	-3,623
Add back Renewable Debt	\$2,468							2,468	2,468	2,468
Renewables Segment NPV @ 8% Discount	\$1,291							1,291	1,291	1,291
New Renewables NPV	\$471							471	471	471
Net Infrastructure Equity								1,518	1,632	1,746
Net Infrastructure Equity Per Share								\$2.08	\$2.10	\$2.39
Parent	2022 EPS									
NMC (Saudi Chemical JV)	\$0.05	10.3x			-6.0x	11.3x	12.3x	\$0.52	\$0.57	\$0.62
Parent Interest attributed to utility - 50%	-\$0.54	18.9x			0.0x	17.9x	16.9x	-\$5.05	-\$4.78	-\$4.52
Parent Debt- 50%	-\$20,761							-\$13.38	-\$13.38	-\$13.38
Total Equity Value								-\$17.91	-\$17.60	-\$17.28
Shares Outstanding								776		
Total Equity Value								\$79.00	\$85.00	\$91.00
Current Share Price								\$80.73	\$80.73	\$80.73
NTM Dividend Yield								4.74%		
Total Potential Return								10.03%		

Source: BoFA Global Research estimates, company report, Bloomberg



Price objective basis & risk

Duke Energy (DUK)

Our \$85 PO is derived from a sum-of-the-parts valuation. We value the Electric and Gas utilities using peer 2022E P/E multiples. We apply a 2.0x multiple premium to Duke's operations in FL/IN to reflect more favorable regulatory environments. We apply a 0.5x multiple to the Carolinas given upside to spending in improving regulatory construct combined with latest IRP. We value the other regulated electric utilities at 16.5x and the gas utilities at peer group multiples of 14.5x 2022E P/E, respectively. Both electric and gas peer P/E multiples are grossed up by 5% for the groups CAGR to reflect capital appreciation across the sector. The commercial midstream, and transmission are valued on a 2022E EV/EBITDA basis. We use a 9.0x multiple for midstream and transmission segment. We add the net present value of renewable segment using an 8% discount rate. We subtract out the impact of commercial debt, and add back for the renewable debt.

Upside risks: constructive rate case results, higher capital expenditure additions vs our assumptions, lower interest rates. Downside risks: poor rate case results, operating errors, and negative changes in the regulatory environment, Macro risks: Increases in interest rates and decreases in equity market valuations.

Analyst Certification

I, Julien Dumoulin-Smith, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.



North American Utilities, Alternative Energy & LNG Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	AES	AES	AES US	Julien Dumoulin-Smith
	Alliant Energy Corporation	LNT	LNT US	Julien Dumoulin-Smith
	AltaGas	YALA	ALA CN	Julien Dumoulin-Smith
	Atlantica Yield	AY	AY US	Julien Dumoulin-Smith
	Atmos Energy Corporation	ATO	ATO US	Richard Ciciarelli, CFA
	Avista	AVA	AVA US	Richard Ciciarelli, CFA
	Clearway Energy	CWENA	CWEN/A US	Julien Dumoulin-Smith
	Clearway Energy	CWEN	CWEN US	Julien Dumoulin-Smith
	CMS Energy	CMS	CMS US	Julien Dumoulin-Smith
	Consolidated Edison	ED	ED US	Julien Dumoulin-Smith
	DTE Energy	DTE	DTE US	Julien Dumoulin-Smith
	Duke Energy	DUK	DUK US	Julien Dumoulin-Smith
	Edison International	EIX	EIX US	Julien Dumoulin-Smith
	Emera Inc	YEMA	EMA CN	Julien Dumoulin-Smith
	Entergy	ETR	ETR US	Julien Dumoulin-Smith
	Essential Utilities	WTRG	WTRG US	Julien Dumoulin-Smith
	Evergy, Inc	EVRG	EVRG US	Julien Dumoulin-Smith
	First Solar, Inc.	FSLR	FSLR US	Julien Dumoulin-Smith
	FirstEnergy	FE	FE US	Julien Dumoulin-Smith
	Idacorp	IDA	IDA US	Julien Dumoulin-Smith
	NextEra Energy	NEE	NEE US	Julien Dumoulin-Smith
	NRG Energy	NRG	NRG US	Julien Dumoulin-Smith
	OGE Energy Corp	OGE	OGE US	Julien Dumoulin-Smith
	PG&E Corporation	PCG	PCG US	Julien Dumoulin-Smith
	PNM Resources Inc.	PNM	PNM US	Julien Dumoulin-Smith
	PPL Corporation	PPL	PPL US	Julien Dumoulin-Smith
	Sempra Energy	SRE	SRE US	Julien Dumoulin-Smith
	Spire	SR	SR US	Richard Ciciarelli, CFA
	Sunnova Energy	NOVA	NOVA US	Julien Dumoulin-Smith
	SunRun	RUN	RUN US	Julien Dumoulin-Smith
	Vistra Energy	VST	VST US	Julien Dumoulin-Smith
NEUTRAL				
	Ameren Corporation	AEE	AEE US	Julien Dumoulin-Smith
	American Electric Power	AEP	AEP US	Julien Dumoulin-Smith
	Avangrid	AGR	AGR US	Julien Dumoulin-Smith
	Black Hills Corporation	BKH	BKH US	Julien Dumoulin-Smith
	CenterPoint Energy	CNP	CNP US	Julien Dumoulin-Smith
	Cheniere Energy Inc	LNG	LNG US	Julien Dumoulin-Smith
	Dominion Energy	D	D US	Julien Dumoulin-Smith
	Hannon Armstrong	HASI	HASI US	Julien Dumoulin-Smith
	Hydro One	YH	H CN	Julien Dumoulin-Smith
	NextDecade	NEXT	NEXT US	Julien Dumoulin-Smith
	NextEra Energy Partners	NEP	NEP US	Julien Dumoulin-Smith
	NiSource Inc	NI	NI US	Julien Dumoulin-Smith
	ONE Gas, Inc.	OGS	OGS US	Richard Ciciarelli, CFA
	Pinnacle West	PNW	PNW US	Julien Dumoulin-Smith
	Portland General Electric Company	POR	POR US	Julien Dumoulin-Smith
	Public Service Enterprise Group	PEG	PEG US	Julien Dumoulin-Smith
	Southern Company	SO	SO US	Julien Dumoulin-Smith
	Southwest Gas Holdings	SWX	SWX US	Richard Ciciarelli, CFA
	Tellurian Inc	TELL	TELL US	Julien Dumoulin-Smith
	Xcel Energy Inc	XEL	XEL US	Julien Dumoulin-Smith
UNDERPERFORM				
	Algonquin Power & Utilities Corp	AQN	AQN US	Julien Dumoulin-Smith
	Algonquin Power & Utilities Corp	YAQN	AQN CN	Julien Dumoulin-Smith
	American Water Works	AWK	AWK US	Julien Dumoulin-Smith
	Bloom Energy	BE	BE US	Julien Dumoulin-Smith
	Eversource Energy	ES	ES US	Julien Dumoulin-Smith
	Exelon	EXC	EXC US	Julien Dumoulin-Smith
	Fortis	YFTS	FTS CN	Julien Dumoulin-Smith
	Fortis Inc	FTS	FTS US	Julien Dumoulin-Smith
	Hawaiian Electric Industries	HE	HE US	Julien Dumoulin-Smith
	MGE Energy	MGEE	MGEE US	Julien Dumoulin-Smith
	New Jersey Resources Corp	NJR	NJR US	Richard Ciciarelli, CFA



North American Utilities, Alternative Energy & LNG Coverage Cluster

Investment rating	Company	BoFA Ticker	Bloomberg symbol	Analyst
	Northwest Natural Holdings	NWN	NWN US	Richard Ciciarelli, CFA
	NorthWestern Corporation	NWE	NWE US	Julien Dumoulin-Smith
	South Jersey Industries	SJI	SJI US	Richard Ciciarelli, CFA
	SunPower Corp.	SPWR	SPWR US	Julien Dumoulin-Smith
	Unitil Corporation	UTL	UTL US	Julien Dumoulin-Smith
	WEC Energy Group Inc	WEC	WEC US	Julien Dumoulin-Smith
RSTR				
	Vivint Solar	VSLR	VSLR US	Julien Dumoulin-Smith

iQmethodSM Measures Definitions

Business Performance	Numerator	Denominator
Return On Capital Employed	NOPAT = (EBIT + Interest Income) * (1 - Tax Rate) + Goodwill Amortization	Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill Amortization
Return On Equity	Net Income	Shareholders' Equity
Operating Margin	Operating Profit	Sales
Earnings Growth	Expected 5-Year CAGR From Latest Actual	N/A
Free Cash Flow	Cash Flow From Operations – Total Capex	N/A
Quality of Earnings		
Cash Realization Ratio	Cash Flow From Operations	Net Income
Asset Replacement Ratio	Capex	Depreciation
Tax Rate	Tax Charge	Pre-Tax Income
Net Debt-To-Equity Ratio	Net Debt = Total Debt, Less Cash & Equivalents	Total Equity
Interest Cover	EBIT	Interest Expense
Valuation Toolkit		
Price / Earnings Ratio	Current Share Price	Diluted Earnings Per Share (Basis As Specified)
Price / Book Value	Current Share Price	Shareholders' Equity / Current Basic Shares
Dividend Yield	Annualised Declared Cash Dividend	Current Share Price
Free Cash Flow Yield	Cash Flow From Operations – Total Capex	Market Cap. = Current Share Price * Current Basic Shares
Enterprise Value / Sales	EV = Current Share Price * Current Shares + Minority Equity + Net Debt + Other LT Liabilities	Sales
EV / EBITDA	Enterprise Value	Basic EBIT + Depreciation + Amortization

iQmethodSM is the set of BoFA Global Research standard measures that serve to maintain global consistency under three broad headings: Business Performance, Quality of Earnings, and valuations. The key features of iQmethod are: A consistently structured, detailed, and transparent methodology. Guidelines to maximize the effectiveness of the comparative valuation process, and to identify some common pitfalls.

iQdatabase[®] is our real-time global research database that is sourced directly from our equity analysts' earnings models and includes forecasted as well as historical data for income statements, balance sheets, and cash flow statements for companies covered by BoFA Global Research.

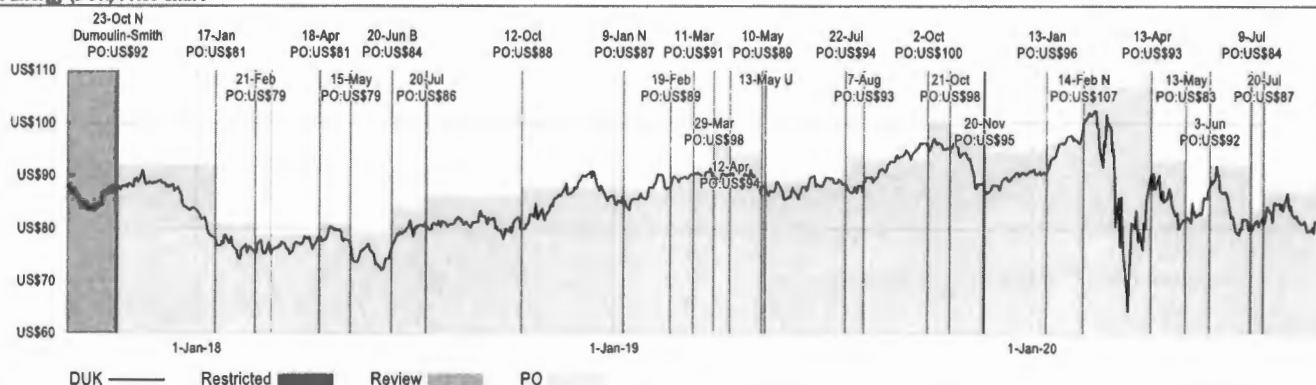
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Disclosures

Important Disclosures

Duke Energy (DUK) Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

Equity Investment Rating Distribution: Utilities Group (as of 30 Jun 2020)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	76	51.01%	Buy	56	73.68%
Hold	33	22.15%	Hold	22	66.67%
Sell	40	26.85%	Sell	29	72.50%

Equity Investment Rating Distribution: Global Group (as of 30 Jun 2020)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1632	52.21%	Buy	1031	63.17%
Hold	711	22.74%	Hold	444	62.45%
Sell	783	25.05%	Sell	407	51.98%

* Issuers that were investment banking clients of BoFA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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Duke Energy

The Feedback from our Upgrade

Reiterate Rating: BUY | PO: 85.00 USD | Price: 82.00 USD

What is so controversial? Feedback on our upgrade

Following our earlier upgrade of shares from Neutral to Buy this week, we revisit the key debates among some investors. We stress a broad perception we may be too early in getting constructive on shares where recent track record would suggest a need to await further execution & avoid pitfalls. To this perception, we stress less downside than feared, reflected principally in the form of less exposure to a negative Supreme Court case (pending before NC from its last rate case). While the current rate cases focuses on prospective recovery (and we anticipate a similar outcome to Dominion), the court has yet to rule on only ~\$500mn of coal ash spend in rates today from the '17 rate case, limiting NT EPS revisions if the order aligns w/ D's outcome. The next date the Supreme Court can issue a decision is Sept. 25 (or if not in December). With no statutory time frame on a rate case decision, timing of NCUC order could correspond w/ cues from the higher court. Ultimately, we perceive a variety of scenarios are reflected in updated EPS CAGR figures as well as balance sheet (no further equity needs). Bottom line, we remain quite confident on our call given both accelerated nature of datapoints & greater de-risking in NC than widely appreciated by Street. Reiterate Buy.

Further upside on capex & CAGR ahead with the IRP too

Additionally, assuming the final IRP path is more aligned with the NC Governor's 70% carbon reduction target, we see upside to out-year EPS estimates from incremental renewable capex to replace coal retirements (potentially leading to RAB growth of upwards of ~7% from 6% today). We currently bake in minimal EPS impact within the current 5-yr plan from potential incremental renewable capex. On timing here too – we perceive the recommendation from the key stakeholder group should lead to a much clearer view of just which incremental renewable plan will be adopted by December including specifics on just which regulatory reforms could be adopted as well. Further, we see the election (in which incumbent Democrats continue to poll quite well) as a likely positive given potential for execution to continue under existing administration.

Estimates (Dec)

(US\$)	2018A	2019A	2020E	2021E	2022E
EPS	4.72	5.06	5.07	5.20	5.44
GAAP EPS	4.69	5.12	5.07	5.20	5.44
EPS Change (YoY)	3.3%	7.2%	0.2%	2.6%	4.6%
Consensus EPS (Bloomberg)			5.07	5.23	5.50
DPS	3.64	3.78	3.85	3.84	3.95

Valuation (Dec)

	2018A	2019A	2020E	2021E	2022E
P/E	17.4x	16.2x	16.2x	15.8x	15.1x
GAAP P/E	17.5x	16.0x	16.2x	15.8x	15.1x
Dividend Yield	4.4%	4.6%	4.7%	4.7%	4.8%
EV / EBITDA*	16.8x	14.5x	13.6x	12.9x	12.1x
Free Cash Flow Yield*	-3.7%	-3.3%	-2.4%	-1.5%	-2.9%

* For full definitions of *IQmethod™* measures, see page 7.

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Timestamp: 11 September 2020 07:03AM EDT

11 September 2020

Equity

Key Changes

(US\$)	Previous	Current
2020E Rev (m)	26,358.5	26,387.5
2021E Rev (m)	27,307.0	27,238.3
2022E Rev (m)	28,209.5	28,144.3

Julien Dumoulin-Smith

Research Analyst
BofAS
+1 646 855 5855
julien.dumoulin-smith@bofa.com

Richard Ciciarelli, CFA

Research Analyst
BofAS
richard.ciciarelli@bofa.com

Harris Pollans

Research Analyst
BofAS
harris.pollans@bofa.com

Aric Li

Research Analyst
BofAS
aric.li@bofa.com

Anya Shelekhin

Research Analyst
BofAS
anya.shelekhin@bofa.com

Ryan Greenwald

Research Analyst
BofAS
ryan.greenwald@bofa.com

Dariusz Lozny, CFA

Research Analyst
BofAS
dariusz.lozny@bofa.com

Stock Data

Price	82.00 USD
Price Objective	85.00 USD
Date Established	9-Sep-2020
Investment Opinion	B-1-7
52-Week Range	62.13 USD - 103.79 USD
Mkt Val (mn) / Shares Out (mn)	60,305 USD / 735.4
Average Daily Value (mn)	267.67 USD
BofA Ticker / Exchange	DUK / NYS
Bloomberg / Reuters	DUK US / DUK.N
ROE (2020E)	7.7%
Net Dbt to Eqty (Dec-2019A)	129.8%

DEC – Duke Energy Carolinas

DEP – Duke Energy Progress

IRP – Integrated Resource Plan

iQprofileSM Duke Energy

iQmethodSM – Bus Performance*

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Return on Capital Employed	3.3%	3.9%	3.9%	3.9%	4.0%
Return on Equity	6.2%	8.2%	7.7%	7.5%	7.6%
Operating Margin	19.1%	22.8%	23.1%	23.3%	23.9%
Free Cash Flow	(2,203)	(2,003)	(1,435)	(887)	(1,730)

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Cash Realization Ratio	2.7x	2.7x	2.5x	2.5x	2.4x
Asset Replacement Ratio	2.0x	2.6x	2.2x	2.1x	2.1x
Tax Rate	14.6%	12.7%	12.2%	12.2%	12.1%
Net Debt-to-Equity Ratio	130.8%	129.8%	120.1%	120.8%	124.1%
Interest Cover	2.5x	2.9x	3.0x	3.0x	3.0x

Income Statement Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Sales	24,521	25,079	26,388	27,238	28,144
% Change	4.1%	2.3%	5.2%	3.2%	3.3%
Gross Profit	10,441	11,556	12,305	12,909	13,659
% Change	-3.5%	10.7%	6.5%	4.9%	5.8%
EBITDA	8,848	10,261	10,977	11,564	12,298
% Change	-4.7%	16.0%	7.0%	5.3%	6.3%
Net Interest & Other Income	(2,094)	(2,204)	(2,176)	(2,248)	(2,371)
Net Income (Adjusted)	2,666	3,707	3,764	3,948	4,164
% Change	-12.8%	39.0%	1.5%	4.9%	5.5%

Free Cash Flow Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Net Income from Cont Operations (GAAP)	2,647	3,755	3,767	3,950	4,166
Depreciation & Amortization	4,696	4,548	4,876	5,212	5,581
Change in Working Capital	0	(53)	(97)	(68)	(78)
Deferred Taxation Charge	1,079	1,260	1,100	1,000	400
Other Adjustments, Net	(1,236)	319	(110)	(141)	83
Capital Expenditure	(9,389)	(11,832)	(10,971)	(10,840)	(11,882)
Free Cash Flow	-2,203	-2,003	-1,435	-887	-1,730
% Change	-55.4%	9.1%	28.4%	38.2%	-95.1%

Balance Sheet Data (Dec)

(US\$ Millions)	2018A	2019A	2020E	2021E	2022E
Cash & Equivalents	591	590	675	760	547
Trade Receivables	3,134	3,183	3,299	3,375	3,455
Other Current Assets	5,989	5,958	6,100	6,153	6,171
Property, Plant & Equipment	91,694	98,650	104,745	110,373	116,674
Other Non-Current Assets	43,984	43,984	43,984	43,984	43,984
Total Assets	145,392	152,366	158,804	164,644	170,831
Short-Term Debt	6,816	7,167	7,343	7,746	7,784
Other Current Liabilities	8,225	8,190	8,351	8,411	8,431
Long-Term Debt	51,123	53,776	55,094	58,121	62,161
Other Non-Current Liabilities	35,394	35,761	35,632	35,493	35,578
Total Liabilities	101,558	104,894	106,419	109,770	113,954
Total Equity	43,834	46,498	51,411	53,900	55,903
Total Equity & Liabilities	145,392	151,392	157,830	163,670	169,857

* For full definitions of iQmethodSM measures, see page 7.

Company Sector

Electric Utilities

Company Description

Duke Energy Corporation operates as a regulated utility company in the US based in Charlotte, NC. The company operates regulated electric utilities in the Midwest, Florida and the Carolinas and supplies electric service to approximately 7.5 million residential, commercial, and industrial customers. Duke owns 50,000MW of capacity. The regulated gas utilities serve more than 1.6 million customers in the Carolinas and Ohio. A commercial arm owns contract renewables and pipelines across the US.

Investment Rationale

We rate DUK Buy as we see LT growth as intact despite years of negative revisions, by contrast, we see likely de-risking of regulatory compact into '21 legislative session alongside improving capex budget from accelerated coal retirements (beyond base plan presented) as enabling one of few positive inflections in EPS estimates in recent years. Opportunity to re-rate off exceptionally low expectations vs peers.

Stock Data

Average Daily Volume 3,264,329

Quarterly Earnings Estimates

	2019	2020
Q1	1.24A	1.14A
Q2	1.12A	1.08A
Q3	1.79A	1.83E
Q4	0.93A	1.02E



More on regulatory reform from above...

Also, we see substantially greater traction for meaningful regulatory reform/ carbon legislation and aggressive adoption of renewables capex post-election (particularly the NC House of Reps, which republicans currently have majority). The Senate race (much tighter) too will be important given their more conservative stance on energy legislation in the past. '21 looks set to see an improved backdrop for DUK considering the various potential outcomes of 'another' shot at legislation this time, with what seems like meaningfully improved stakeholder support. Prospects such as MYRPs (to avoid consecutive cases), ROE banding, & PBRs all appear quite possible.

Clarifying earned ROEs in the Carolinas: Lag embedded

Following our upgrade of DUK to Buy, we further clarify our earned ROE assumptions for the Carolinas. Our base case assumes Duke's pending coal ash outcome is in line with Dominion's precedent order (10yr amortization absent a return), which we already reflect in our EPS estimates w/ 20-30bps of lag ('23 and beyond) as we expect Duke will offset most of the coal ash lag next year and into '22 with cost mitigation. This translates to ~5-9c of drag per year vs mgmt. estimates of 5-10c/yr. Hence, our earned ROEs for DEC for '21 / '22 / '23 / '24 are 9.6% / 9.5% / 9.4% / 9.3% and for DEP of 9.6% / 9.6% / 9.5% / 9.4%, respectively (see full table for all electric utility earned ROEs inside).

The base case embedded in our model currently assumes Duke's pending coal ash outcome is in line with Dominion's precedent order as we reflect 20-30bps of lag in the out years ('23 and beyond). The coal ash lag does not occur until 2023 because we expect Duke will offset most of this lag next year and into '22 with cost mitigation. This expected coal ash lag translates to ~5-9c of drag per year vs mgmt. estimates of 5-10c/yr. Hence, our earned ROEs for Duke Energy Carolinas for '21 / '22 / '23 / '24 are 9.6% / 9.5% / 9.4% / 9.3% and for Duke Energy Progress of 9.6% / 9.6% / 9.5% / 9.4%, clearly exhibiting lag from coal ash in '23/24/25, and compare to the authorized ROEs of 9.5% and 9.6% in SC and NC, respectively.

Table 1: Duke Carolinas Earned ROE assumptions – clearly incorporates lag of w/ 5-9c of drag assumed

Duke Carolinas Earned ROE assumptions	2019A	2020E	2021E	2022E	2023E	2024E	2025E
Duke Energy Carolinas (NC+SC) Reported Book ROE	10.50%	9.5-10%	9.5-10%	9.5-10%	9.5-10%	9.5-10%	9.5-10%
Weighted (NC+SC) Regulatory ROE	9.90%	9.85%	9.57%	9.57%	9.57%	9.57%	9.57%
Adjusted Book ROE	10.50%	9.73%	9.58%	9.51%	9.44%	9.37%	9.32%
Coal Ash Headwind (regulatory Lag)			0.0%	0.1%	0.1%	0.2%	0.3%
Coal Ash EPS Drag			-	0.01	0.03	0.05	0.06
Duke Energy Progress Reported Book ROE	10.50%	9.5-10%	9.5-10%	9.5-10%	9.5-10%	9.5-10%	9.5-10%
Ratebase-Weighted Authorized ROE (NC+SC)	9.94%	9.82%	9.58%	9.58%	9.58%	9.58%	9.58%
Adjusted Book ROE	9.52%	9.63%	9.60%	9.57%	9.47%	9.40%	9.43%
Book ROE Delta	-0.98%	0.12%	0.15%	0.18%	0.28%	0.35%	0.32%
Coal Ash Headwind (regulatory Lag)	0.00%	0.00%	0.0%	0.0%	0.1%	0.2%	0.2%
Coal Ash EPS Drag			-	0.00	0.02	0.03	0.02
Total EPS Impact from Coal Ash (order similar to Dominion assumed)			-	0.02	0.05	0.07	0.09

Source: BofA Global Research estimates, company report



DUK EPS estimates

Table 2: DUK EPS estimates

DUK Model - Dashboard/Overview

EPS Estimates	2019A	2020E	2021E	2022E	2023E	2024E	2025E
Electric							
Carolinas	1.95	1.88	1.87	1.93	2.00	2.08	2.16
Indiana	0.60	0.60	0.62	0.65	0.67	0.70	0.74
Ohio - Electric	0.22	0.25	0.26	0.28	0.31	0.34	0.39
Progress- Carolinas	1.12	1.15	1.13	1.15	1.16	1.18	1.20
Progress- Florida	0.96	1.01	1.05	1.10	1.13	1.16	1.20
Commercial Transmission	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eliminations	-0.04	0.00	0.00	0.00	0.00	0.00	0.00
Consolidated Earnings	4.81	4.89	4.94	5.11	5.27	5.46	5.70
Guidance	4.77	4.94					
Gas							
Ohio - Gas	0.12	0.13	0.16	0.19	0.21	0.23	0.25
Piedmont (PNY)	0.27	0.31	0.33	0.37	0.41	0.45	0.49
Midstream Pipelines	0.24	0.11	0.04	0.05	0.06	0.08	0.09
Eliminations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consolidated Earnings	0.62	0.55	0.53	0.61	0.68	0.75	0.83
Guidance	0.51	0.72					
Commercial Renewables	0.27	0.32	0.33	0.30	0.28	0.29	0.28
Guidance	0.32	0.33					
Parent/Other	-0.64	-0.69	-0.60	-0.57	-0.50	-0.46	-0.46
Guidance	-0.60	-0.73					
Adjustments							
BofAe EPS	5.07	5.07	5.20	5.44	5.72	6.04	6.39
<i>Previous Estimates</i>	5.06	5.07	5.20	5.44	5.72	6.04	6.39
Guidance	4.95-5.15	5.05-5.45					
Consensus	5.02	5.08	5.24	5.49	5.84	6.20	7.04
Mgmt EPS CAGR: 4-6% from 2019-2024E (OLD)	5.00	5.25	5.51	5.79	6.08	6.39	
Low End	4.80	5.05	5.41	5.62	5.85	6.08	
High End	5.20	5.45	5.62	5.96	6.31	6.69	
BofAe CAGR '19-'24e						3.9%	
Mgmt EPS CAGR: 4-6% off '21 expected \$5.15 base (NEW)			5.15	5.41	5.68	5.96	6.26
Low End				5.36	5.57	5.79	6.02
High End				5.46	5.79	6.13	6.50
BofAe CAGR '21-'25e							5.6%

Source: BofA Global Research estimates, company report, Bloomberg



Price objective basis & risk

Duke Energy (DUK)

Our \$85 PO is derived from a sum-of-the-parts valuation. We value the Electric and Gas utilities using peer 2022E P/E multiples. We apply a 2.0x multiple premium to Duke's operations in FL/IN to reflect more favorable regulatory environments. We apply a 0.5x multiple to the Carolinas given upside to spending in improving regulatory construct combined with latest IRP. We value the other regulated electric utilities at 16.5x and the gas utilities at peer group multiples of 14.5x 2022E P/E, respectively. Both electric and gas peer P/E multiples are grossed up by 5% for the groups CAGR to reflect capital appreciation across the sector. The commercial midstream, and transmission are valued on a 2022E EV/EBITDA basis. We use a 9.0x multiple for midstream and transmission segment. We add the net present value of renewable segment using an 8% discount rate. We subtract out the impact of commercial debt, and add back for the renewable debt.

Upside risks: constructive rate case results, higher capital expenditure additions vs our assumptions, lower interest rates. Downside risks: poor rate case results, operating errors, and negative changes in the regulatory environment, Macro risks: Increases in interest rates and decreases in equity market valuations.

Analyst Certification

I, Julien Dumoulin-Smith, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.



North American Utilities, Alternative Energy & LNG Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	AES	AES	AES US	Julien Dumoulin-Smith
	Alliant Energy Corporation	LNT	LNT US	Julien Dumoulin-Smith
	AltaGas	YALA	ALA CN	Julien Dumoulin-Smith
	Atlantica Yield	AY	AY US	Julien Dumoulin-Smith
	Atmos Energy Corporation	ATO	ATO US	Richard Ciciarelli, CFA
	Avista	AVA	AVA US	Richard Ciciarelli, CFA
	Clearway Energy	CWENA	CWEN/A US	Julien Dumoulin-Smith
	Clearway Energy	CWEN	CWEN US	Julien Dumoulin-Smith
	CMS Energy	CMS	CMS US	Julien Dumoulin-Smith
	Consolidated Edison	ED	ED US	Julien Dumoulin-Smith
	DTE Energy	DTE	DTE US	Julien Dumoulin-Smith
	Duke Energy	DUK	DUK US	Julien Dumoulin-Smith
	Edison International	EIX	EIX US	Julien Dumoulin-Smith
	Emera Inc	YEMA	EMA CN	Julien Dumoulin-Smith
	Entergy	ETR	ETR US	Julien Dumoulin-Smith
	Essential Utilities	WTRG	WTRG US	Julien Dumoulin-Smith
	Evergy, Inc	EVRG	EVRG US	Julien Dumoulin-Smith
	First Solar, Inc.	FSLR	FSLR US	Julien Dumoulin-Smith
	FirstEnergy	FE	FE US	Julien Dumoulin-Smith
	Idacorp	IDA	IDA US	Julien Dumoulin-Smith
	NextEra Energy	NEE	NEE US	Julien Dumoulin-Smith
	NRG Energy	NRG	NRG US	Julien Dumoulin-Smith
	OGE Energy Corp	OGE	OGE US	Julien Dumoulin-Smith
	PG&E Corporation	PCG	PCG US	Julien Dumoulin-Smith
	PNM Resources Inc.	PNM	PNM US	Julien Dumoulin-Smith
	PPL Corporation	PPL	PPL US	Julien Dumoulin-Smith
	Sempra Energy	SRE	SRE US	Julien Dumoulin-Smith
	Spire	SR	SR US	Richard Ciciarelli, CFA
	Sunnova Energy	NOVA	NOVA US	Julien Dumoulin-Smith
	SunRun	RUN	RUN US	Julien Dumoulin-Smith
	Vistra Energy	VST	VST US	Julien Dumoulin-Smith
NEUTRAL				
	Ameren Corporation	AEE	AEE US	Julien Dumoulin-Smith
	American Electric Power	AEP	AEP US	Julien Dumoulin-Smith
	Avangrid	AGR	AGR US	Julien Dumoulin-Smith
	Black Hills Corporation	BKH	BKH US	Julien Dumoulin-Smith
	CenterPoint Energy	CNP	CNP US	Julien Dumoulin-Smith
	Cheniere Energy Inc	LNG	LNG US	Julien Dumoulin-Smith
	Dominion Energy	D	D US	Julien Dumoulin-Smith
	Hannon Armstrong	HASI	HASI US	Julien Dumoulin-Smith
	Hydro One	YH	H CN	Julien Dumoulin-Smith
	NextDecade	NEXT	NEXT US	Julien Dumoulin-Smith
	NextEra Energy Partners	NEP	NEP US	Julien Dumoulin-Smith
	NiSource Inc	NI	NI US	Julien Dumoulin-Smith
	ONE Gas, Inc.	OGS	OGS US	Richard Ciciarelli, CFA
	Pinnacle West	PNW	PNW US	Julien Dumoulin-Smith
	Portland General Electric Company	POR	POR US	Julien Dumoulin-Smith
	Public Service Enterprise Group	PEG	PEG US	Julien Dumoulin-Smith
	Southern Company	SO	SO US	Julien Dumoulin-Smith
	Southwest Gas Holdings	SWX	SWX US	Richard Ciciarelli, CFA
	Tellurian Inc	TELL	TELL US	Julien Dumoulin-Smith
	Xcel Energy Inc	XEL	XEL US	Julien Dumoulin-Smith
UNDERPERFORM				
	Algonquin Power & Utilities Corp	AQN	AQN US	Julien Dumoulin-Smith
	Algonquin Power & Utilities Corp	YAQN	AQN CN	Julien Dumoulin-Smith
	American Water Works	AWK	AWK US	Julien Dumoulin-Smith
	Bloom Energy	BE	BE US	Julien Dumoulin-Smith
	Eversource Energy	ES	ES US	Julien Dumoulin-Smith
	Exelon	EXC	EXC US	Julien Dumoulin-Smith
	Fortis	YFTS	FTS CN	Julien Dumoulin-Smith
	Fortis Inc	FTS	FTS US	Julien Dumoulin-Smith
	Hawaiian Electric Industries	HE	HE US	Julien Dumoulin-Smith
	MGE Energy	MGEE	MGEE US	Julien Dumoulin-Smith
	New Jersey Resources Corp	NJR	NJR US	Richard Ciciarelli, CFA



North American Utilities, Alternative Energy & LNG Coverage Cluster

Investment rating	Company	BoFA Ticker	Bloomberg symbol	Analyst
	Northwest Natural Holdings	NWN	NWN US	Richard Ciciarelli, CFA
	NorthWestern Corporation	NWE	NWE US	Julien Dumoulin-Smith
	South Jersey Industries	SJI	SJI US	Richard Ciciarelli, CFA
	SunPower Corp.	SPWR	SPWR US	Julien Dumoulin-Smith
	Unitil Corporation	UTL	UTL US	Julien Dumoulin-Smith
	WEC Energy Group Inc	WEC	WEC US	Julien Dumoulin-Smith
RSTR				
	Vivint Solar	VSLR	VSLR US	Julien Dumoulin-Smith

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Business Performance	Numerator	Denominator
Return On Capital Employed	NOPAT = (EBIT + Interest Income) * (1 - Tax Rate) + Goodwill Amortization	Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill Amortization
Return On Equity	Net Income	Shareholders' Equity
Operating Margin	Operating Profit	Sales
Earnings Growth	Expected 5-Year CAGR From Latest Actual	N/A
Free Cash Flow	Cash Flow From Operations – Total Capex	N/A
Quality of Earnings		
Cash Realization Ratio	Cash Flow From Operations	Net Income
Asset Replacement Ratio	Capex	Depreciation
Tax Rate	Tax Charge	Pre-Tax Income
Net Debt-To-Equity Ratio	Net Debt = Total Debt, Less Cash & Equivalents	Total Equity
Interest Cover	EBIT	Interest Expense
Valuation Toolkit		
Price / Earnings Ratio	Current Share Price	Diluted Earnings Per Share (Basis As Specified)
Price / Book Value	Current Share Price	Shareholders' Equity / Current Basic Shares
Dividend Yield	Annualised Declared Cash Dividend	Current Share Price
Free Cash Flow Yield	Cash Flow From Operations – Total Capex	Market Cap. = Current Share Price * Current Basic Shares
Enterprise Value / Sales	EV = Current Share Price * Current Shares + Minority Equity + Net Debt + Other LT Liabilities	Sales
EV / EBITDA	Enterprise Value	Basic EBIT + Depreciation + Amortization

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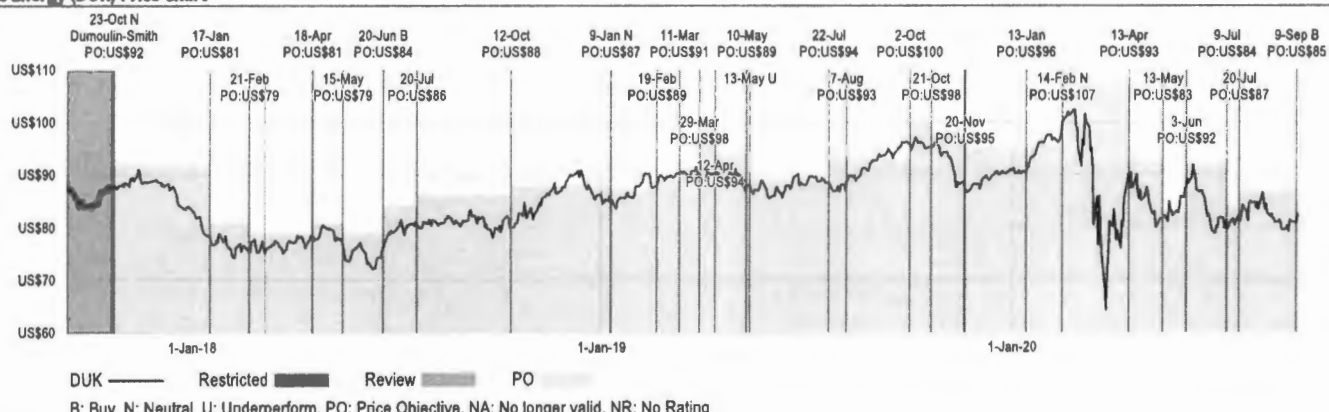
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Important Disclosures

Duke Energy (DUK) Price Chart



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Equity Investment Rating Distribution: Utilities Group (as of 30 Jun 2020)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	76	51.01%	Buy	56	73.68%
Hold	33	22.15%	Hold	22	66.67%
Sell	40	26.85%	Sell	29	72.50%

Equity Investment Rating Distribution: Global Group (as of 30 Jun 2020)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1632	52.21%	Buy	1031	63.17%
Hold	711	22.74%	Hold	444	62.45%
Sell	783	25.05%	Sell	407	51.98%

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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**Duke Energy Progress
Response to
NC Public Staff Data Request
Data Request No. NCPS 152**

Docket No. E-2, Sub 1219

**Date of Request: March 10, 2020
Date of Response: March 19, 2020**

☐

CONFIDENTIAL

☒

NOT CONFIDENTIAL

Confidential Responses are provided pursuant to Confidentiality Agreement

The attached response to NC Public Staff Data Request No. 152-2, was provided to me by the following individual(s): Trudy H. Morris, Project Manager II, and was provided to NC Public Staff under my supervision.

Camal. O. Robinson
Associate General Counsel
Duke Energy Progress

Request:

2. For each active and retired coal-fired generating station, please provide a history of transactions to acquire real property adjoining the facility for the purpose of expanding the compliance boundary with respect to potential groundwater contaminants or for any other reason related to risk management for environmental health and safety purposes. Please provide a narrative that includes a description of the property purchased (including acreage, map, and cost), the date of the transaction, and the current use of the property.

Response:

Mayo Steam Electric Plant:

DEP acquired approximately 56.27 acres of property associated with the Mayo Steam Electric Plant (Mayo) on August 26, 2019 for \$82,000. The acquired property is positioned on the north side of Mayo Lake Road extending to the North Carolina/Virginia state line and was bordered by Duke Energy property on the west, south, and east sides. The property purchase allows Duke Energy to control activities on the property, thereby managing risks to property users downgradient of the Mayo ash basin to the North Carolina/Virginia state line. Duke Energy ownership of property mitigates potential future risk by controlling or eliminating potential exposure pathways associated with Site-related constituents of interest. As a result of the property acquisition, the Mayo ash basin compliance boundary was revised to extend further to the north beyond Mayo Lake Road and 500 feet from the entire waste boundary. The property is currently vacant with the exception of three groundwater monitoring wells that were installed in 2015 for the NCDEQ required ash basin groundwater assessment efforts.

H.F. Lee Steam Electric Plant:

Please refer to the DEP PS DR 140-2, for the 2016 property purchase details for H.F. Lee, including maps and acreage. The property includes groundwater monitoring wells that were installed in 2017 as part of the NCDEQ-required ash basin groundwater assessment efforts. The 1953 Company, LLC property contract was for \$700,880. The Vinson property contract was for \$190,904.

Cape Fear Steam Electric Plant:

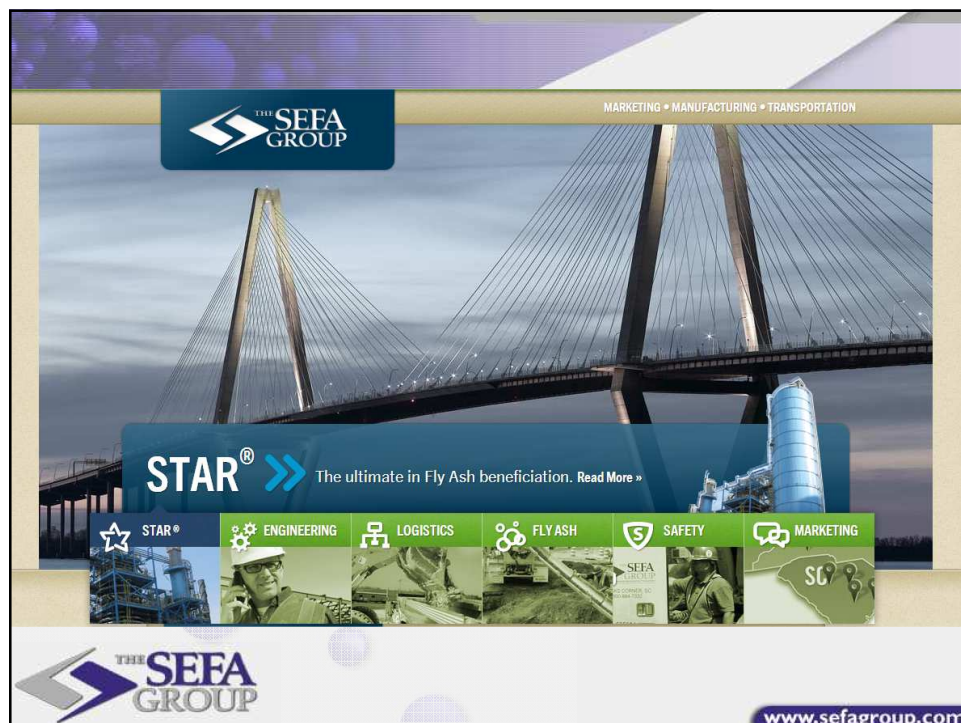
DEP purchased the 13.8 acre property at the toe of the 1985 Ash Basin dam in 2016 for \$130,000. The property included the Norfolk Southern Railway corridor, and DEP continued to lease the property to Norfolk Southern for use of the tracks as needed. NCDEQ – Division of Water Resources was notified of the property purchase and change of compliance boundary in a letter dated September 14, 2016 (attached). To help the Public Staff see where the purchased property was located, attached is also a map from the original CSA showing the rail spur, outlined in red southwest of the 1985 basin, that was not owned by DEP.

North Carolina Public Staff
Data Request No. 152
DEP Docket No. E-2, Sub 1219
Item No. 152-2
Page 2 of 2

Asheville Steam Electric Plant:

DEP purchased a 5.189 acre property on December 10, 2010, located south of the 1982 ash basin dam, for \$1,140,795. This property was to be developed into residential condominiums. DEP purchased the property due to dam safety concerns and potential flooding in dam failure scenarios. This purchase altered the compliance boundary on the south side of the 1982 ash basin. This property was utilized as lay down area for the construction of the Asheville Combined Cycle Plant, and several wells were installed in 2014 as part of the NCDEQ-required ash basin groundwater assessment efforts. The deed map has been attached, as well as an aerial photograph from Buncombe County GIS.

				
2016_09_14 Cape Fear Revised Boundar	Asheville Property Plat.pdf	Asheville Purchased Property Map.pdf	Cape Fear FIGURE 2-1 from Original CS/	Mayo Revised Boundary-SITE LAYO





Company Info

Presentation Summary

1. By-Products & Waste Management
2. STAR® Technology
3. Operating Experience
4. Reclaimed Ash Testing and Commercialization

Processing material reclaimed from coal ash **PONDS** and **LANDFILLS**

THE SEFA GROUP

www.sefagroup.com



Company Info

- Began operations in 1976
- Corporate Office in Lexington, SC
- Operate & Maintain Four (4) Thermal Beneficiation Facilities
- To date have processed more than 5 millions tons
- Developed the STAR® Process

THE SEFA GROUP

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By-Products & Waste Management



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- Disposal Operations began in 2007
- Operated & Managed Four (4) By-Products Management & Disposal Locations.
- Disposed of over 2,000 tons daily at certain facilities.
Average daily disposal rates = 600 – 2600 Tons



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Waste Management

Duke Energy – North Carolina Operations

Facility Operations

- Ash Management at 4 locations in NC
- 2007-2014
 - Marshall
 - Allen
 - Cliffside
 - Belews Creek

Disposal

- Structural Fill Construction
- Ash Pond(s) Management
- Flyash (Lined & Unlined) Landfill Operations
- FGD (Gypsum) Landfill Operations
- Engineering Support and Services

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Waste Management

Duke Energy – North Carolina Operations



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Waste Management

Duke Energy – North Carolina Operations



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Waste Management

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Waste Management

Duke Energy – North Carolina Operations



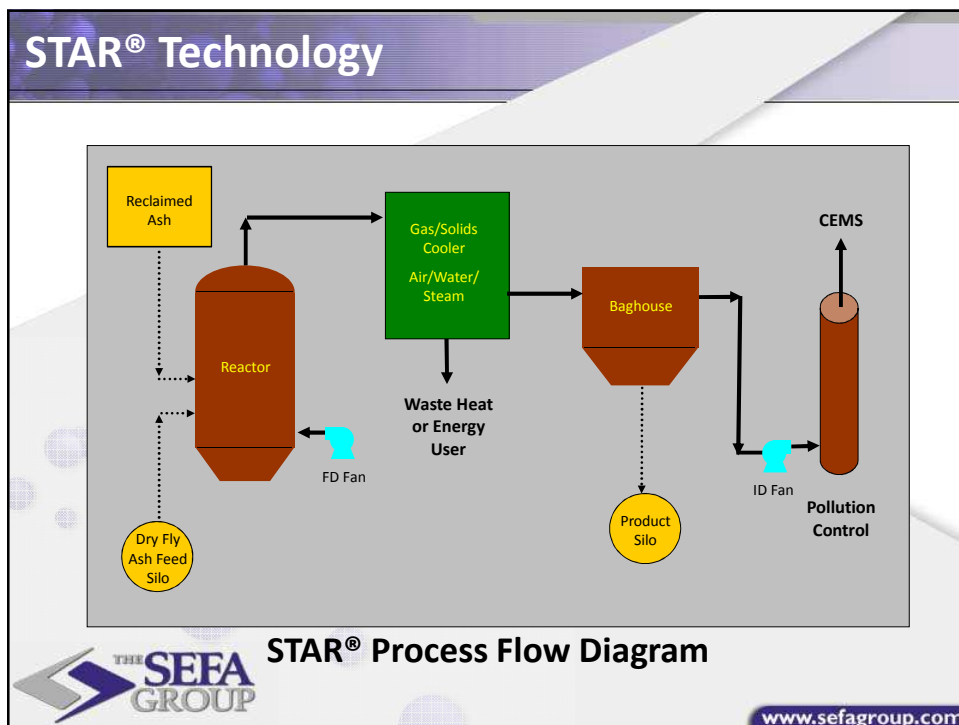
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Waste Management

Duke Energy – North Carolina Operations



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STAR® Technology

Controlled Manufacturing Process

Staged – Conditions in the Reaction Zone are Finitely Controlled

Turbulent – Shearing and Swirling Kinetic Forces Maximize Reaction Rates

Air – Both the Primary Chemical Reagent and the Motive Force for Kinetic Activity

Reactor – Processing Vessel in which Chemical Reactions Occur

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STAR® Technology

STAR® Product Quality

Simultaneously Produces Two Separate Products



High Quality Pozzolan-Grade Fly Ash

- Transparent Air-Entraining Characteristics
- Increased Fineness and Increased Strength
- Class F and Class C Fly Ashes
- Blended to Make High-Calcium, Class F Fly Ash

High Quality Mineral Filler

- Pure Mineral Matter – No Organics
- Particle Size Classification

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STAR® Technology

STAR® Processing Can Be Tailored To:

- Use multiple feed ingredients to produce a range of products that can be applied in markets not previously open to fly ash-derived products;
- Eliminate all unburned carbon in fly ash, allowing the contaminant-free mineral matter to be used as higher-value mineral admixtures;
- Increase the fineness of the mineral matter and improve its strength-producing character in concrete;
- Size-classify the mineral matter;
- Manage certain trace elements, such as mercury, selenium, etc.



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STAR® Operating Experience



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STAR® Operating Experience

McMeekin STAR® - Columbia, SC

Timeline

- Sited at SCE&G's McMeekin Station
- Broke Ground – June 2006
- Shake Down – December / January 2007
- Proof of Concept – July 2007
- Commercial Operations – February 2008

Feed Sources

- Sixteen (16) different ash sources
- Feed Ash - 5.0% to 25.0% LOI

Product Quality

- Shipments have averaged 1.0% LOI
- As low as 0.10% LOI



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STAR® Operating Experience



McMeekin STAR®



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STAR® Operating Experience

Morgantown STAR® - Newburg, MD

Timeline

- Sited at NRG's Morgantown Station
- Broke Ground – February 2011
- Substantial Completion – December 2011
- Commercial Operations – September 2012

Feed Sources

- Three (3) different ash sources
- Feed Ash - 5.0% to 15.0% LOI

Product Quality

- Shipments have averaged < 1.0% LOI



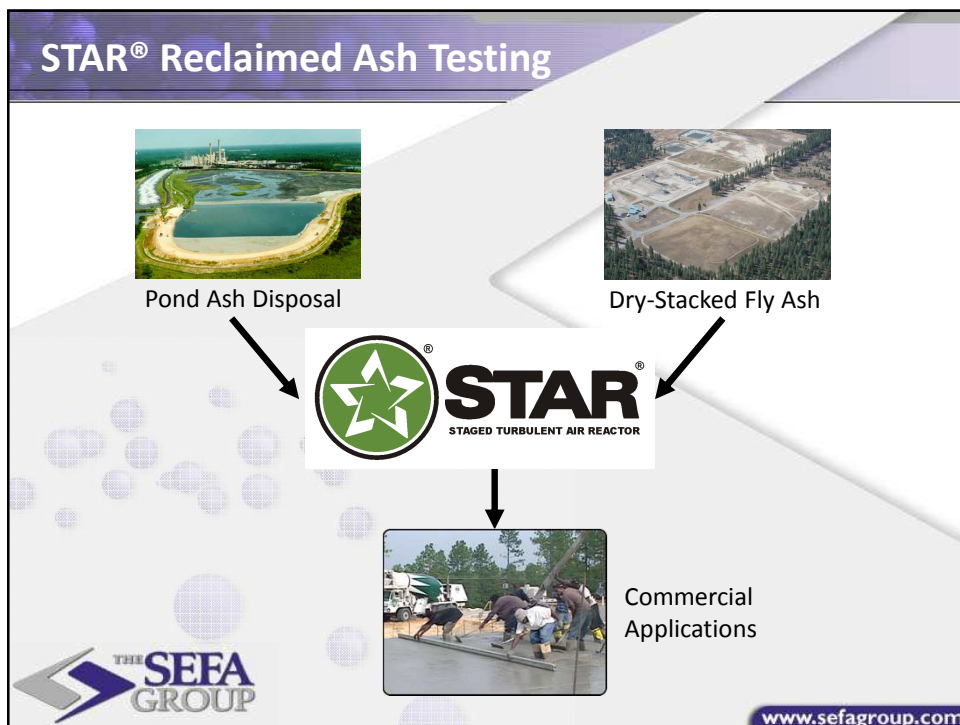
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STAR® Operating Experience



Morgantown STAR®


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STAR® Reclaimed Ash Testing

Reclaimed Ash

- During the 1st Quarter of 2013, the SEFA Group conducted testing at its McMeekin STAR® facility to process material reclaimed from existing ash ponds and landfills.
- The material tested contained up to 30% moisture and varied in LOI from approximately 8% to 19% (dry basis).
- The objectives of this testing were to confirm that the STAR® could transform this material into a suitable pozzolan for use in Ready-Mix Concrete and to determine if the process could remain self-sustaining.



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STAR® Reclaimed Ash Testing

Reclaimed Ash

- Due to the operational flexibility of the STAR® process, the reclaimed material can be successfully fed into the unit with no major modifications required to the standard plant design.
- Tests were conducted by blending certain percentages of reclaimed material with normal dry feed, as well as with 100% reclaimed material as feed.
- The majority of testing was conducted by first screening the material at the location where it was reclaimed (or “mined”).
- In all test cases the material was fed into the unit “As-Is”, and no drying was performed.



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STAR® Reclaimed Ash Testing



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STAR® Reclaimed Ash Testing



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STAR® Reclaimed Ash Testing



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STAR® Reclaimed Ash Testing

CONCRETE MIX RESULTS

As shown in the table on the next slide, laboratory concrete mixes were designed to incorporate six different fly ashes:

1. STAR®-Processed dry fly ash (for a control mix)
2. STAR®-Processed blend of dry fly ash (75%) and Reclaimed Ash (25%)
3. 100% STAR®-Processed Reclaimed Ash (Run 1)
4. 100% STAR®-Processed Reclaimed Ash (Run 2)
5. By-Product Fly Ash (Source A)
6. By-Product Fly Ash (Source B)

NOTE: All mixes were at 25% of total cementitious material



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STAR® Reclaimed Ash Testing

Table 2: Laboratory Concrete Mix Test Results

Cubic Yard Mix Proportions (lbs)	Mix 1 Control	Mix 2 Blend	Mix 3 100%	Mix 4 100%	Mix 5 Plant A	Mix 6 Plant B
Type I Cement	420	420	420	420	420	420
Fly Ash	140	140	140	140	140	140
Loss on Ignition, %	0.9	1.7	1.2	1.9	3.5	2.6
Total Cementitious Material	560	560	560	560	560	560
% SCM	25%	25%	25%	25%	25%	25%
#57 Stone	1850	1850	1850	1850	1850	1850
Natural Sand	1258	1258	1258	1258	1258	1258
City Water, gallons	32.2	32.3	31.5	32.2	32.1	33.0
w/cm Ratio	0.48	0.48	0.47	0.48	0.48	0.49
Water Reducer (oz/cwt)	3.00	3.00	3.00	3.00	3.00	3.00
Air Entrainment (oz/cwt)	0.36	0.36	0.36	0.52	1.60	2.20
Trial Batch Results						
Slump (inches)	4.75	4.75	4.50	4.75	4.75	5.00
Air %	4.4	4.4	4.5	4.4	4.5	5.2
Unit Weight (pcf)	147.5	148.0	147.4	147.6	147.6	146.4
Relative Yield %	98.83%	98.54%	98.77%	98.74%	98.77%	99.71%
Concrete Temp (°F)	56	56	59	60	62	64
Air Temp (°F)	58	59	50	60	60	60
Compressive Strength Results (psi)						
7-day Average	3540	3670	3660	3530	3930	2960
28-day Average	4650	4930	4730	4820	4800	3530
7-28 Gain	1110	1260	1070	1290	870	570



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STAR® Reclaimed Ash Testing

Summary of Test Results

Processed Material as a Suitable Pozzolan

Both the plastic and hardened characteristics of the concretes containing STAR®-Processed Reclaimed Ash were as good as or better than the STAR®-Processed Control (i.e., dry fly ash) concrete.

In addition, the compressive strengths for the concretes containing STAR®-Processed Ashes were higher than the concretes made with normal 'by-product' fly ashes (i.e., non beneficiated).



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STAR® Reclaimed Ash Testing

Summary of Test Results

STAR® Self-Sustaining Operations

Testing has confirmed that the STAR® Technology can process Reclaimed Ash as 100% Raw Feed.

In cases where the combination of Reclaimed Ash moisture is very high, and LOI is very low, the STAR® Waste Heat can be recaptured into the process to eliminate any need for drying or auxiliary fuel.



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STAR® Reclaimed Ash

Commercialization Plans



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Winyah Project

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The Challenge

Lack of Consistent Supply of Quality Product for Ready Mix Customers

- **Inconsistent Supply of Feed Ash**
 - Lack of Coal Fired Generation
 - Problems finding supply of high LOI (8% min) Feed Ash
 - Plant Closures
- **CBO Tied to Power Plant**
 - Flue Gas Treatment
 - Process Cooling



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Winyah Project

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The Solution

Remove CBO Unit and Install STAR

- **Flexibility to Process Either Wet or Dry Ash**
- **Stand Alone Facility**
- **STAR can process Ash with LOI 5-25%**



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Winyah Project

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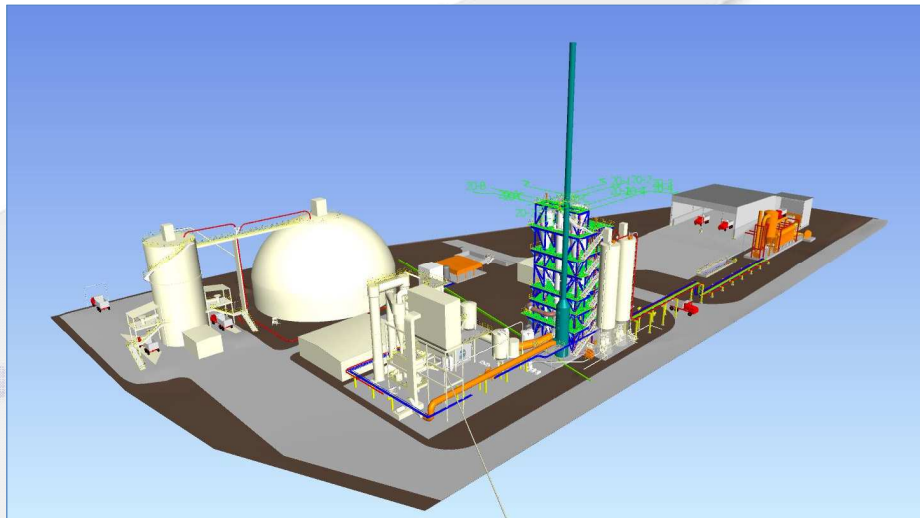
The Work

- Work with SC Environmental Agency to Test and Permit (Summer 2012)
- Operational Tests at McMeekin (March 2013)
- Process Design for Flue Gas, Cooling and Wet Feed
- Present Business Case to Santee Cooper (Summer 2013)
- Commercial Agreements (November 2013)
- Air Permit received February 2014
- Construction began March 2014
- Construction completion December 2014



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STAR® Plant - Winyah Project



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Reclaimed STAR® Ash Plant



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Reclaimed STAR® Ash Plant



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Reclaimed STAR® Ash Plant

News

- The SEFA Group, is building a \$40 million facility to recycle high carbon fly ash produced by the power company Santee Cooper at its Winyah generating station in Georgetown, S.C.
- SEFA also will take in coal fly ash from other Santee Cooper electric generating stations, where the material will be processed into a marketable product.
- The new facility is expected to recycle up to 400,000 tons of fly ash per year. SEFA will use the material as a primary ingredient for its STAR process to produce a pure mineral product, free of organic contaminants.



www.sefagroup.com

Reclaimed STAR® Ash Plant

News

- Santee Cooper has worked to recycle as much of its ash as possible (90%). ...with EPA regulations spurring the closure of coal-fired generating stations around the country, there has become greater demand for ash and the development of new technology that increases the viability of pond ash.

R.M. Singletary, executive vice president of corporate services, says "This is a triple win. It is cost effective, which means it is responsive to our customers' best interests. It utilizes innovative technology to help an important South Carolina industry be sustainable. And it is an EPA-approved use of ash."



www.sefagroup.com

Reclaimed STAR® Ash Plant

Where does it make sense to locate a STAR Plant?

- Strong Concrete Market
- Utility's Need/Desire for Pond Clean Out or Landfill Reclamation
- Sufficient Volume of Ash to Sustain the Business Plan



www.sefagroup.com

© 2009 The SEFA Group, Inc.



THANK YOU



www.sefagroup.com

Bednarcik Rebuttal Public Staff Cross-Examination Exhibit 9

Public Staff 139



Google Earth

Image © 2020 Maxar Technologies



2000 ft



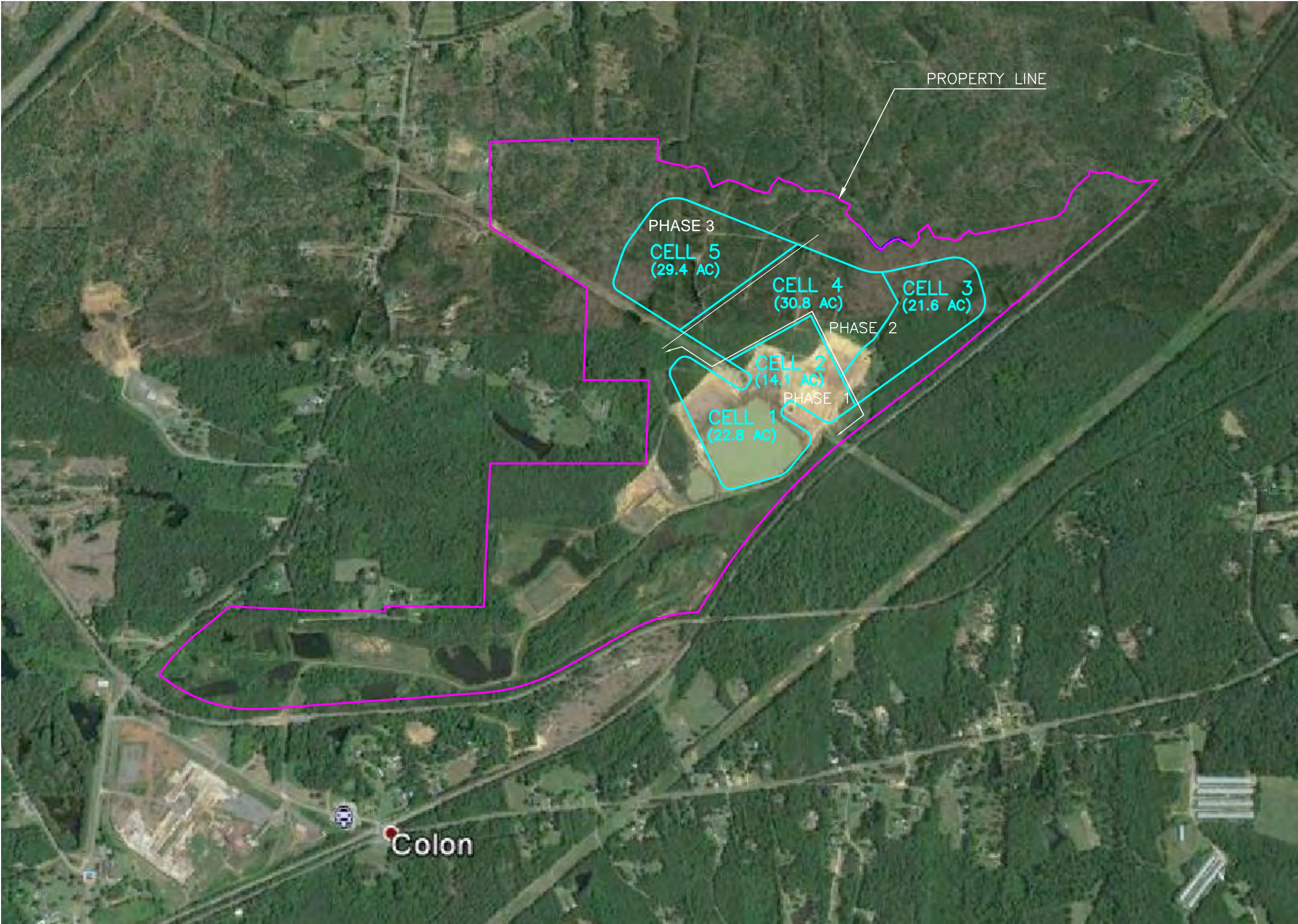
Brickhaven Mine 2020 Photo



Imagery ©2020 Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2020

500 ft

I/A



C:\pwworking\tpa\0595982\Site Image.dwg, Layout1, 11/6/2014 5:13:08 AM, jgaul



-4224-

HDR Engineering Inc.
of the Carolinas

440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. F-0116

COLON MINE SITE OVERVIEW



COLON MINE SITE

DATE
11/2014

FIGURE
1



This site is prepared for the inventory of real property found within this jurisdiction and is compiled from recorded deeds, plats and other public records and data. Users of this site are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this site. The County of Lee and Dude Solutions, Inc. assume no legal responsibility for the information contained on this site. Please be advised that you must contact the Lee County Tax Office for accurate tax values. Please contact the Lee County Appraisal Department if any building information is incorrect. The map, layer, data and website (collectively known as "the layer") are for graphical and illustration purposes only. The Lee County Strategic Services Department (hereinafter "the Department") provides the layer and the information contained within to the general public and has not customized the information for any specific or general purpose. Such information was generated from data maintained by different sources and agencies and as such, some limitations may apply based upon restrictions imposed by other sources or agencies supplying data to Lee County (hereinafter "the County"). While the Department strives to make the information on the GIS website as timely, reliable and accurate as possible, neither the Department nor the County local governments make any claims, promises, or guarantees about the accuracy, completeness or adequacy of the contents of the layer. Areas depicted are approximate and are not necessarily accurate to mapping, surveying or engineering standards. The County expressly disclaims liability for errors and omissions in the contents of this site and layer. No warranty of any type, implied, expressed, statutory, UCC or otherwise, including, but not limited to, the warranties of non-infringement of third party rights, title, accuracy of data, merchantability, or fitness for a particular purpose, is given with respect to the substantive content of this layer or its use in private or commercial financial transactions. The fact of distribution of the layer does not constitute any warranty, express, implied or otherwise. The user assumes the entire risk related to the use of this data. If the user intends to make any legal or financial decision based on this data, the user should independently verify the accuracy of the same. The Strategic Services Department and the Lee County local governments are providing this data "as is." In no event will any of the foregoing local governments or their officers and employees be liable to you or to any third party for any direct, indirect, incidental, consequential, special or exemplary damages or lost profit resulting from any use or misuse of this data. Unless otherwise noted on an individual document, files, documents, and information contained in this layer may be copied and distributed for non-commercial use, provided they are copied and distributed without alteration.





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Google Earth



DIVISION OF ENVIRONMENTAL MANAGEMENT

August 4, 1989

MEMORANDUM

To: Dale Overcash
Permits and Engineering Unit

Through: Preston Howard
Regional Supervisor
Wilmington Regional Office

From: Don Safrit
Water Quality Regional Supervisor

Subject: Carolina Power and Light Company
L. V. Sutton Steam Electric Plant
NPDES Permit No. NC0001422
New Hanover County

Original Signed By
A. PRESTON HOWARD, JR

Original Signed By
DONALD SAFRIT

The Wilmington Regional Office's Groundwater and Water Quality Sections have reviewed the June 23, 1989 response by Dr. George Oliver, Environmental Services Manager for CP&L, concerning the proposed groundwater monitoring provisions for the subject facility.

All of CP&L suggested modifications have been considered and the attached Groundwater Monitoring Program should be included in the draft NPDES Permit. It is further recommended that a draft permit be prepared incorporating this condition and others addressed in the renewal process and the draft permit placed at public notice.

Please call if you have any questions.

APH:DS:trw

Attachment

cc: Rick Shiver
Perry Nelson

GROUNDWATER MONITORING

The permittee shall, within three months of permit issuance, upgrade the existing groundwater monitoring system by installation of four (4) new compliance monitoring wells as shown in Appendix A. The permittee shall operate and maintain Lake Sutton, ash disposal ponds and the make-up water intake system such that the wasters of Lake Sutton and the ash disposal ponds do not exceed total dissolved solids and chlorides concentrations of 500 mg/l and 250 mg/l respectively.

The Director and the permittee agree that maintenance of the above stated total dissolved solids and chlorides concentration in Lake Sutton should result in a reduction in total dissolved solids and chlorides concentrations in groundwaters at the permittee's perimeter of compliance. The new groundwater monitoring wells should enhance the capabilities of the Director and the permittee to evaluate the impact of the above required actions on groundwater quality.

The groundwater monitoring system and sampling requirements contained herein may be altered by a letter of agreement between the permittee and the Division of Environmental Management.

In addition to the monitoring specified in Part I(A), monitoring of Lake Sutton and area groundwaters shall be conducted in accordance with the following requirements: (all samples shall be grab samples)

Surface Waters Sampling

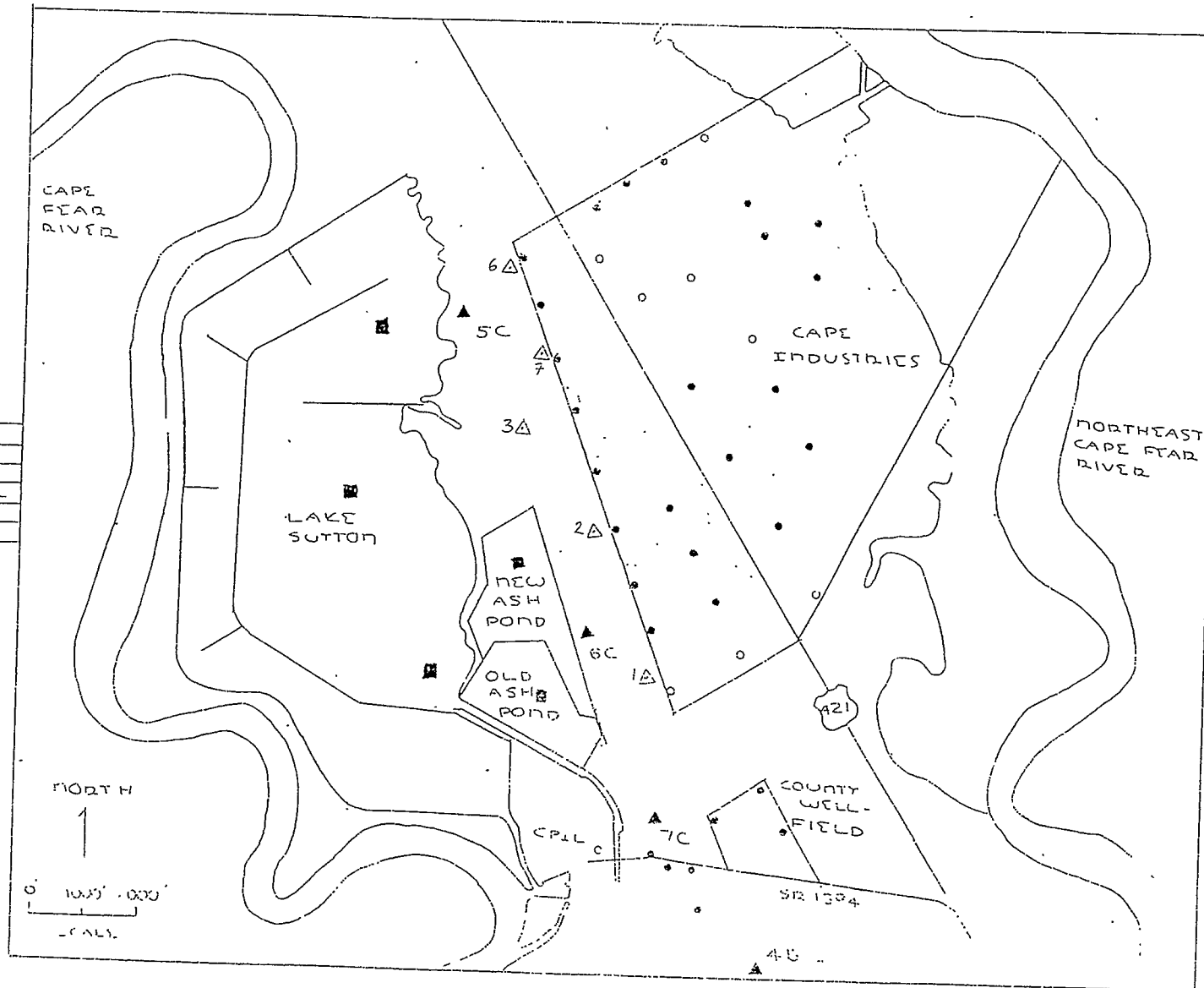
(Water column sampling from surface to bottom at one (1) foot intervals for each of the five (5) water sampling locations)

<u>Parameter</u>	<u>Frequency</u>	<u>Monitoring Location</u>
Total Dissolved Solids	Monthly	Intake and Appendix A Locations
Chlorides	Monthly	Intake and Appendix A Locations

Groundwaters Sampling

<u>Parameter</u>	<u>Frequency</u>	<u>Monitoring Location</u>
Water Level	March/July/November	Appendix A Well Locations
Elevation	March/July/November	Appendix A Well Locations
pH	March/July/November	Appendix A Well Locations
Total Dissolved Solids	March/July/November	Appendix A Well Locations
Chlorides	March/July/November	Appendix A Well Locations
Arsenic	March/July/November	Appendix A Well Locations
Selenium	March/July/November	Appendix A Well Locations
Iron	March/July/November	Appendix A Well Locations

FIGURE 1: A MAP
THAT SHOWS THE
LOCATION OF THE
CORRELATES AND
MONITOR STATIONS
CPL - L.V. SECTION



- LEGEND:
- △ - PROPOSED LOCATION OF NEW MONITOR OR WELL (EXPOSE TO ± 40-50' ZONE)
 - ▲ - LOCATION OF EXISTING MONITOR WELL
 - - WATER SUPPLY WELL (ACTIVE)
 - - WATER SUPPLY WELL (INACTIVE)
 - - SURFACE WATER MONITORING STATION
 - 7C - WELL NO.

I/A



State of North Carolina
Department of Environment, Health and Natural Resources
Division of Environmental Management
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
William W. Cobey, Jr., Secretary

George T. Everett, Ph.D
Director

March 5, 1992

Dr. George J. Oliver
Carolina Power & Light Company
Post Office Box 1551, CPB-3A2
Raleigh, North Carolina 27602

Subject: Permit No. NC0003433
Authorization to Construct
Carolina Power & Light Company
Cape Fear Facility (S.E.P.)
Wastewater Treatment Facility
Chatham County

Dear Dr. Oliver

A letter of request for an Authorization to Construct was received January 30, 1992 by the Division and final plans and specifications for the subject project have been reviewed and found to be satisfactory. Authorization is hereby granted for the construction of a new cooling tower diversion box with stop log gates, a new 120 foot long 10 foot diameter discharge structure with stop logs which will divert approximately 140 MGD of cooling water to the discharge channel (to dilute the 0.5 MGD Ash Pond discharge), a sampling bridge across the discharge channel within 300 feet below the final ash pond discharge, a rip-rap weir across the discharge channel within 300 feet below the final ash pond discharge, and all associated piping, modifications, controls and appurtenances with discharge of treated wastewater into an unnamed tributary to the Cape Fear River, classified Class WS-III waters.

This Authorization to Construct is issued in accordance with Part III paragraph A of NPDES Permit No. NC0003433 issued July 22, 1991 and shall be subject to revocation unless the wastewater treatment facilities are constructed in accordance with the conditions and limitations specified in Permit No. NC0003433

The sludge generated from these treatment facilities must be disposed of in accordance with G.S. 143-215.1 and in a manner approved by the North Carolina Division of Environmental Management.

Regional Offices

Asheville	Fayetteville	Mooresville	Raleigh	Washington	Wilmington	Winston-Salem
704/251-6208	919/486-1541	704/663-1699	919/733-2314	919/946-6481	919/395-3900	919/896-7007

Pollution Prevention Pays

P.O. Box 29535, Raleigh, North Carolina 27626-0535 Telephone 919-733-7015
An Equal Opportunity Affirmative Action Employer

In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement wastewater treatment or disposal facilities.

The Raleigh Regional Office, phone no. 919/ 571-4700 shall be notified at least forty-eight (48) hours in advance of operation of the installed facilities so that an in-place inspection can be made. Such notification to the regional supervisor shall be made during the normal office hours from 8:00 a.m. until 5:00 p.m. on Monday through Friday, excluding State Holidays.

Upon completion of construction and prior to operation of this permitted facility, a certification must be received from a professional engineer certifying that the permitted facility has been installed in accordance with the NPDES Permit, this Authorization to Construct and the approved plans and specifications. Mail the Certification to the Permits and Engineering Unit, P.O. Box 29535, Raleigh, NC 27626-0535.

Upon classification of the facility by the Certification Commission, the Permittee shall employ a certified wastewater treatment plant operator to be in responsible charge of the wastewater treatment facilities. The operator must hold a certificate of the type and grade at least equivalent to the classification assigned to the wastewater treatment facilities by the Certification Commission.

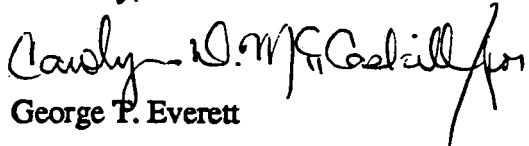
A copy of the approved plans and specifications shall be maintained on file by the Permittee for the life of the facility.

Failure to abide by the requirements contained in this Authorization to Construct may subject the Permittee to an enforcement action by the Division of Environmental Management in accordance with North Carolina General Statute 143-215.6A to 143-215.6C.

The issuance of this Authorization to Construct does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances which may be imposed by other government agencies (local, state, and federal) which have jurisdiction.

One (1) set of approved plans and specifications is being forwarded to you. If you have any questions or need additional information, please contact Mr. John Seymour telephone number 919/733-5083.

Sincerely,


George T. Everett

cc: Chatham County Health Department
Raleigh Regional Office, Water Quality
Training and Certification Unit (no rating change)
Facilities Assessment Unit



North Carolina Department of Natural Resources & Community Development

James B. Hunt, Jr., Governor

James A. Summers, Secretary

Wells Rebuttal Exhibit 2
DIVISION OF
PERMITTING
ENVIRONMENTAL
MANAGEMENT

Robert F. Helms
Director

Telephone 919 733-7015

January 16, 1984

Mr. B. J. Furr, Vice President
Operations Training and Technical Services
Carolina Power and Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

SUBJECT: Permit No. NC0003433
Authorization to Construct
Carolina Power and Light Company
Cape Fear Steam Electric Plant
New Fly Ash Lagoon
Chatham County

Dear Mr. Furr:

A letter of request for Authorization to Construct was received December 6, 1983, by the Division and final plans and specifications for the subject project have been reviewed and found to be satisfactory. Authorization is hereby granted for the construction of a 59.5 acre fly ash settling/storage lagoon to serve Carolina Power and Light Company's Cape Fear Steam Electric Plant in Chatham County.

This Authorization to Construct is issued in accordance with Part III paragraph C of NPDES Permit No. NC0003433 issued August 30, 1976, and shall be subject to revocation unless the wastewater treatment facilities are constructed in accordance with the conditions and limitations specified in Permit No. NC0003433.

The Permittee must employ a certified wastewater operator in accordance with Part III paragraph D of the reference permit.

The sludge generated from these treatment facilities must be disposed of in accordance with G.S. 143-215.1 and in a manner approvable by the North Carolina Division of Environmental Management.

In event the facilities fail to perform satisfactorily in meeting it's NPDES permit effluent limits, Carolina Power and Light Company shall take such immediate corrective action as may be required by this Division, including the construction of additional wastewater treatment and disposal facilities.

One (1) set of approved plans and specifications is being forwarded to you. If you have any questions or need additional information, please contact H. Dale Crisp, telephone number 919/733-5083, extension 108.

Sincerely yours,

Original Signed By
FORREST R. WESTALL
Robert F. Helms

cc: Mr. Forrest R. Westall ✓
Raleigh Regional Supervisor
Raleigh Regional Office Manager
Chatham County Health Department

HDC/djb

DIVISION OF ENVIRONMENTAL MANAGEMENT

July 5, 1978

**Mr. M. A. McDuffie
Senior Vice Engineer
Engineering and Construction
Carolina Power and Light Company
336 Fayetteville Street
P.O. Box 1551
Raleigh, N.C. 27602**

**SUBJECT: Permit No. NC0003433
Authorization to Construct
Carolina Power and Light Company
Cape Fear Steam Electric Plant
Ash Pond Construction
Chatham County**

Dear Mr. McDuffie:

The final plans and specifications for the subject project have been reviewed and found to be satisfactory. Authorization is hereby granted for the construction of an addition to the existing ash storage basin to consist of approximately 70 additional acres of surface area for ash storage and the raising of the existing ash basin dike at the Cape Fear Steam Electric Plant of Chatham County.

This is a Class I wastewater treatment plant which requires that the person in responsible charge hold a valid Grade I certificate.

This Authorization to Construct shall become voidable unless Carolina Power and Light Company makes application to the Environmental Protection Agency for modification of the ash pond discharge point to the plant discharge canal while the existing ash basin dike is raised. Upon completion of the project, the ash basin discharge to the Cape Fear River will resume.

This Authorization to Construct shall be subject to revocation unless the wastewater treatment facilities are constructed in accordance with the conditions and limitations specified in Permit No. NC0003433.

Also, enclosed is a copy of WPC Form #50 "Cost of Wastewater Treatment Works." This form is to be completed and returned to this office within thirty (30) days after the project is completed.

**Authorization to Construct
Carolina Power and Light Company
Cape Fear Steam Electric Plant
Ash Pond Construction
Chatham County**

**Page 2
Cont.**

One (1) set of approved plans and specifications is being forwarded to you.

Sincerely yours,

Original Signed By

A. F. McRORIE

A. F. McRorie

Director

Enclosures

**cc: Environmental Protection Agency
Chatham County Health Department
Mr. R. S. Taylor
Mr. W. S. Hoffman
Planning and Management Section**



JAMES B. HUNT, JR.
GOVERNOR

BILL HOLMAN
SECRETARY

KERR T. STEVENS
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WATER QUALITY

GROUNDWATER SECTION

February 25, 2000

Mr. Steve Davis, ORC
CP&L's W. H. Weatherspoon Plant
491 Power Plant Road
Lumberton, NC 28358

Subject: Administrative Amendment
Reduction of Groundwater Monitoring Requirements
Permit No. NC0005363

Dear Mr. Davis:

The Fayetteville Regional Office Groundwater Section has reviewed the Weatherspoon Plant's monitoring reports. Upon this review we would like to allow temporary closure of the monitoring wells around the lagoon and no further groundwater monitoring at this time.

The procedures for temporary abandonment are outlined in the North Carolina Administrative Code Title 15A 2C .0113 (a). For your reference, I have included this portion.

(1) Procedures for temporary abandonment of wells:

- (A) Upon temporary removal from service or prior to being put into service, the well shall be sealed with a water-tight cap or seal compatible with casing and installed so that it cannot be removed easily by hand.
- (B) The well shall be maintained whereby it is not a source or channel for contamination during temporary abandonment.
- (C) Every temporarily abandoned well shall be protected with a casing.

On, Tuesday, February 22, 2000, the Fayetteville Regional Office staff contacted Brian Wootton, of the Groundwater Central Office, to confirm the monitoring wells do not need to be sampled in March 2000.

Please notify this office in writing within thirty days after the temporary abandonment of the monitoring wells. If you have any questions, please contact Jennifer Phillips at (910)486-1541. Thank you.

Sincerely,

Stephen A. Barnhardt
Regional Groundwater Supervisor

c: Ms. Louise England, CP&L, 3932 New Hill-Holleman Rd, New Hill, NC 27562-0327

Mr. Brian Wootton, GW Central Office, 1636 MSC, Raleigh, NC 27669-1636

Mr. Charles Weaver, DWQ-NPDES Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617



**NCDENR/DWQ
FACT SHEET FOR NPDES PERMIT DEVELOPMENT**

Carolina Power & Light Company
NPDES No. NC0005363

Facility Information			
(1.) Facility Name:	Weatherspoon Steam Electric Plant		
(2.) Permitted Flow (MGD):	NA	(6.) County:	Robeson
(3.) Facility Class:	I	(7.) Regional Office:	Fayetteville
(4.) Facility Status: (New or existing)	Existing	(8.) USGS Topo Quad:	I23SW (SE Lumberton, NC)
(5.) Permit Status: (i.e., New, Modification, or Renewal)	Renewal		
Stream Characteristics			
(1.) Receiving Stream:	Lumber River		
(2.) Subbasin:	030751	(8.) Drainage Area (mi ²):	716.00
(3.) Index No.:	14-13	(9.) Summer 7Q10 (cfs)	122
(4.) Stream Classification:	C-Swamp	(10.) Winter 7Q10 (cfs):	192
(5.) 303(d) Listed:	YES	(11.) 30Q2 (cfs):	304
(6.) 305(b) Status:		(12.) Average Flow (cfs):	869.00
(7.) Use Support:		(13.) IWC (%):	Variable

Conditions Incorporated into Permit Renewal

Proposed Conditions	Parameters Affected	Basis for Condition(s)
Change monitoring frequency (E,U,D) from monthly to quarterly.	Outfall 002 (Temperature)	This is more stringent than semi-annual monitoring required in General Permit NCG500000 (for non-contact cooling water), but provides some break in monitoring based on recent instream track record.
Add footnote requiring TRC monitoring only when chlorine is added.	Outfall 002 (TRC)	Reflects General Permit NCG500000 language.
Add quarterly effluent monitoring and limit	Outfall 002 (pH)	Reflects General Permit NCG500000 language.

NPDES PERMIT FACT SHEET

Carolina Power & Light Company

Page 2

NPDES No. NC0005363

Add effluent limit	Outfall 001 (pH)	Current permit has monitoring but no limit. Change is consistent with other CP&L facility.
Add effluent monitoring.	Outfall 001 (temperature)	Change is consistent with other CP&L facility.
Change permit expiration date to 7/31/04	Permit Expiration	Reflects basin plan schedule

PROJECT NOTES

Summary

- This is a permit renewal for CP&L's Weatherspoon coal-fired steam electric plant. Facility consists of 3 coal-fired units with a total net capacity of 176 MW, and 4 internal combustion turbines with a total net capacity of 138 MW.
- Outfall 001 (recirculated cooling water, coal pile runoff, stormwater runoff, ash sluice water, domestic wastewater, chemical metal cleaning wastewater) is permitted to discharge from a 225 acre cooling pond (Class I rating) under extreme weather conditions or pond maintenance. This pond does not discharge as part of normal operation. There was one discharge event in 1999 due to Hurricane Floyd, and one discharge event in 1998 (refer to DMR Summary). There is no flow limit.
- Outfall 002 discharges non-contact cooling water from heat exchanger units. Chlorine is added as needed to control biological fouling of heat exchanger; however, per EPA Form 2C, sodium hypochlorite has not been added to Outfall 002 since 7/98. Between 98-99, monthly avg flows have generally ranged from 2-7 MGD (IWC of 2-8%), with daily max flow of 9 MGD (IWC= 10%). There were discharges on 255 days over 13-month period. There is no flow limit.
- The facility discharges to the Lumber River (C-Swamp), which is listed on the 303(d) list due to mercury fish advisories. For this facility, the EPA Form 2C data reports no detection of Hg (<0.2 ug/l) from 001/002 samples (n=1).

Permit Issues

- In the renewal application, CP&L requested four modifications:
 1. *Require Outfall 002 TRC monitoring only when chlorine is added.* [NPDES Response: Agreed. This is consistent with current General Permit language for non-contact cooling water].
 2. *Delete Outfall 002 monthly temperature monitoring (E,U,D) because past monitoring has shown no adverse effect.* [NPDES Response: Reduce frequency to quarterly. Instream monthly data for 98/99 has shown limited influence on temperature (max of 1°C increase) between up/down stations.]
 3. *Eliminate requirement to notify Division by June 30 if no discharge occurs from Outfall 001.* [NPDES Response: Disagree. This condition is within the tox test requirements, and AqTox Unit needs this separate submission to track toxicity compliance].
 4. *Eliminate the requirement to conduct ash pond groundwater monitoring. Groundwater monitoring over the past nine years has demonstrated that the ash pond is not adversely impacting groundwater.* [NPDES Response: Although the NPDES permit includes boilerplate that provides for groundwater monitoring when needed, the actual request and monitoring requirements originated by letter from the Groundwater Section. Therefore, NPDES will alert permittee to discuss directly with the GW Section].
- Facility regulated by effluent guidelines 40CFR423 (Steam Electric Power Generators). Outfall 002 TRC limit was previously inserted per 423.13(b) for once-through cooling water >25MW. Previous parameters recommended for monitoring for 001/002 are based on guidelines and data. These will be recommended again.

DMR Data Summary.

- Outfall 001 (Cooling Pond). There was one discharge event in 1999 in response to Hurricane Floyd in September (5 day discharge; daily flow ranged from 44-51 MGD; pH 7.9; TSS 3 mg/l; O&G <5 mg/l; As 0.038 mg/l; Cu <0.010 mg/l; Fe 0.11 mg/l; Se 0.015 mg/l; Acute tox >99%). There was also one discharge event in March 1998 (6 day discharge; daily flows ranged from 1.4-36 MGD; pH 7.1; TSS 10 mg/l; O&G < 5 mg/l; As 0.006 mg/l; Cu 0.043 mg/l; Fe 0.13 mg/l; Se 0.004 mg/l; Acute tox >99%). Acute tox test (24-hr LC50, Fathead minnow) passed for all annual tests (n=3) between 1995-99. There was no discharge reported for 1996 and 97.
- Outfall 002(non-contact cooling water). Monthly discharge volumes generally range from 2-7 MGD. TRC is generally 0. Max increase in downstream temp (relative to upstream) is 1°C, and this increasing trend was reported for only 4/21 months; therefore, effluent does not appear to impact instream temp. EPA Form 2C Pollutant Analysis (n=1) detected copper at 23 ug/l (NC Action Level = 7 ug/l x Dilution(9.75) = 68 ug/l allowable) and zinc at 15 ug/l (NC Action Level = 50 ug/l x Dilution (9.75) = 487 ug/l allowable). Mercury was reported as < 0.2 ug/l. **FRO- do you know where the upstream/downstream samples are collected for Outfall 002 (e.g., 200-feet downstream)? I'd like to expand descriptions in the permit, since this is relevant to temp.**

evaluation.. No, not exactly Steve Davis is ORE + can be reached at 910 671-1217, but I expect at most accessible location possible. I tried to call him before

WLA Data. The last WLA was conducted 3/94. I mailed this back + he was not in.

Region Data.

- In a memo dated 6/7/99, the FRO (KK, PR) recommended permit reissuance with the following comments:
 1. FRO does not agree with CP&L request to delete temp monitoring currently performed at Outfall 002. **FRO- are you comfortable with NPDES proposed change to quarterly?** Yes All
 2. FRO suggests the CP&L request to eliminate ash pond groundwater monitoring be addressed with DWQ GW Section. [Note: This issue to be resolved outside current permit, between permittee and GW Section].
 3. FRO o.k. with CP&L request to monitor TRC (at 002) only when chlorine is added.
 4. FRO recommends permit renewal in keeping with basinwide strategy.
- FRO conducted CEI on 4/26/99. No deficiencies were reported.

Proposed Schedule for Permit Issuance

Draft Permit to Public Notice: 2/9/00
Permit Scheduled to Issue: 3/27/00

State Contact

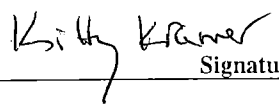
If you have any questions on any of the above information or on the attached permit, please contact Tom Belnick at (919) 733-5038, extension 543.

Copies of the following are attached to provide further information on the permit development:

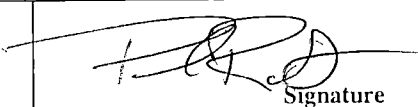

- Reasonable Potential Analysis (majors only)
- Existing permit effluent sheets with changes noted (existing facilities only)
- Draft Permit

<u>NPDES Recommendation by:</u>	 Signature	1-12-00 Date
----------------------------------------	-------------------------------------------------------------------------------------------------	-----------------

Regional Office Comments : Concur with permit as drafted.
Thankyou
Kitty

<u>Regional Recommendation by:</u>	 Signature	2-1-00 Date
-------------------------------------------	--------------------------------------------------------------------------------------------------	----------------

Reviewed and accepted by:

<u>Regional Supervisor:</u>	 Signature	1-20-00 Date
<u>NPDES Unit Supervisor:</u>	 Signature	6/23/00 Date

DIVISION OF WATER QUALITY

Fayetteville Regional Office

Water Quality Section

June 7, 1999

MEMORANDUM

TO : Dave Goodrich, Supervisor

NPDES Permits
Archdale Building

FROM : Kitty Kramer and Paul Rawls

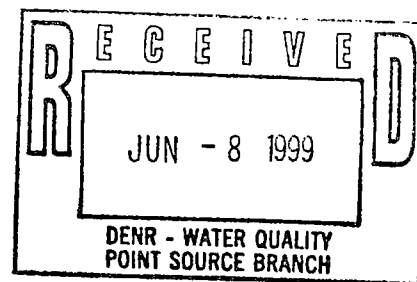
Subject : Minor NPDES Permit Renewals

Weatherspoon Steam Electric Plant WWTP, NC0005363

Town of Clarkton WWTP , NC0021610

Orrum High School WWTP , NC0034100

Deep Branch El. School WWTP , NC0034070



The following are comments for the subject minor permit renewals. If further information is required please advised.

- Weatherspoon Steam Electric Plant WWTP, NC0005363
 - No rating sheet attached, no change in rating, Class I , Lagoon
 - No special conditions, limitations or monitoring suggested other than addressed below:

The permittee has asked for the following modifications of the NPDES permit.

 - "Require monitoring of TRC at Outfall 002 only when chlorine is added.
The FRO finds this request acceptable if consistent with other similar facilities.
 - Delete temperature monitoring currently performed at Outfall 002.
The FRO does NOT find this request acceptable. Temperature is believed critical in the slow moving water of the Lumber River.
 - Eliminate the requirement to conduct as pond groundwater monitoring.
This item should be addressed by the DWQ Groundwater Section.
- Recommend reissuance in keeping with basin wide strategy.

Project Phone Log
Tom Belnick, NPDES Unit

NPDES NC00 05363
Facility CPL Weatherspoon
County _____

- 1) Art Barnhardt - FRO/GW Super 1-6-00
- Can we remove GW monitor? Art will review data
- 2) Jennifer Phillips - FRO/Hydrogeol 1-6-00
Jennifer is reviewing data.
1-7-00

Se - high in GW -

1/10 I discussed w/ FRO-GW (Jennifer Phillips) - I'll add
blank in permit that facilities should contact GW
about monitoring reqs.

2/10 Steve Davis, CPL ORC 910-671-1217
- u/d stations for 002 are approx 1/4 mile up/down
of outfall.



Carolina Power & Light Company
Weatherspoon Steam Electric Plant
491 Power Plant Rd.
Lumberton, NC 28358

File No: WSPN - 12520B-1

May 21, 1999

Mr. Kerr T. Stevens
North Carolina Division of Water Quality
512 N. Salisbury Street
P. O. Box 29535
Raleigh, N. C. 27626-0535

Subject: Weatherspoon Steam Electric Plant
National Pollutant Discharge Elimination System (NPDES) Permit No. NC0005363
Renewal Application

Dear Mr. Stevens:

The current NPDES permit for Carolina Power & Light Company's Weatherspoon Steam Electric Plant located in Robeson County expires on November 30, 1999. CP&L hereby requests that the NPDES permit for the facility be reissued. The Weatherspoon Steam Electric Plant is expected to continue to operate over the next five years as it has previously, and no major changes are expected that might affect the discharges from the plant that are identified in this application. Enclosed are the EPA Application Form 1 - General Information and EPA Application Form 2C - Wastewater Discharge Information, both in triplicate.

With reissuance of the NPDES permit, CP&L requests the following:

- Require the monitoring of total residual chlorine (TRC) at Outfall 002 only when chlorine is added. Currently, CP&L monitors TRC weekly, regardless of chlorine addition.
- Delete the temperature monitoring currently performed at Outfall 002 - including upstream and downstream monitoring. Temperature monitoring over the past years has demonstrated that discharge from this outfall does not have an adverse effect on the temperature of the Lumber River.
- Eliminate the requirement to notify the Division by June 30 if no discharge occurs from Outfall 001 as per Part III, Condition E of the current permit. Since the NPDES DMR for this outfall already identifies that no discharge has occurred, the requirement to send in a separate letter is redundant.
- Eliminate the requirement to conduct ash pond groundwater monitoring. Groundwater monitoring over the past nine years has demonstrated that the ash pond is not adversely impacting the groundwater at this facility.

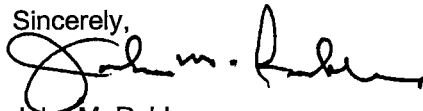
09 MAY 24 PM 2:12

RECEIVED
GENERAL WATER QUALITY
ADMINISTRATIVE SERVICES

Descriptions of sludge disposal for the different waste streams are included in Attachment 3 of the EPA Application Form 2C.

If there are any questions regarding the enclosed information, please contact Ms. Louise England at (919) 362-3522.

Sincerely,

A handwritten signature in black ink, appearing to read "John M. Ruble". The signature is fluid and cursive, with a large initial "J" and a distinct "R" at the end.

John M. Ruble
Plant Manager - Weatherspoon Plant

Enclosures



memo


Date: August 20, 2009

To: Laurie Moorhead
Dulcie Phillips
Kent Tyndall
Billy Milam

Leigh Barr
Ricky Miller
Larry Baxley
Robert Howard

Cc: Cam Wheeler
Dan Kemp
Shannon Langley
Steve Cahoon

Alan Madewell
Fred Holt
Robin Bryson

From: John Toepfer 

Subject: Progress Energy/Duke Energy and DENR Meeting on July 23, 2009

Attendance:

Ted Bush – Section Chief, Aquifer Protection Section - DENR
Debra Watts – Supervisor, Groundwater Protection Unit – DENR
Betty Wilcox – Groundwater Protection Unit - DENR
Eric Smith – Groundwater Protection Unit - DENR
Matt Matthews - NPDES Unit – DENR
Sergei Chernikov – NPDES Unit - DENR
Ed Sullivan, Allen Stowe and George Everett – Duke Energy
Cam Wheeler, Alan Madewell and John Toepfer - PEC

Debra Watts stated that they (APS) had received and responded to many questions from the media and the public about ash ponds so far this year. Some had requested copies of groundwater monitoring data and APS had provided it when available. When asked by the public, the APS staff had commended the utility companies for volunteering this groundwater monitoring program and maintaining a productive working relationship with the agency.

DENR along with PEC posed questions to discuss at this meeting. DENR then developed the "Topics to Discuss" which lead the meeting. I include the questions along with items discussed below:

1. Is it feasible to evaluate the entire power plant site for compliance as one source rather than on an individual site-by-site basis (e.g. landfills, active ash ponds, inactive ash ponds, etc.)?

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Ted Bush stated that this is not an unreasonable question. Both Aquifer Protection Section and NPDES were open to such an evaluation but stated it would require bringing solid waste to the table to discuss. Then if all DENR Divisions were open to such an evaluation, the statutes would need to be changed along with the corresponding regulations. George Everett and Cam Wheeler have the action item to bring Solid Waste and Water Quality DENR personnel to the table to discuss further.

2. Is it feasible to evaluate these same sites on a risk-based approach rather than on a 2L basis (does DWQ support or not support)? Additionally, if groundwater discharging to surface water, but the surface water still meets NPDES limits or water quality standards, is this acceptable?

As above, DENR is open to risk based approaches but must follow the statutes and regulations which force them to follow 2L. Would require statute and corresponding regulation changes to allow risk based approaches for our industry. Right now, only dry cleaners and leaking USTs have risk based cleanup standards. This is a long standing issue from industry and has consistently been opposed by environmental organizations. There is a proposed bill in the state legislature which discusses risk based cleanup standards for industry but it does not look promising. Cam Wheeler and George Everett will discuss this in their future meeting with DENR Solid Waste and Water Quality.

Debra Watts stated that if you have a site where a water body is located within your compliance boundary around an ash pond and groundwater flows into this water body, you can have exceedances of 2L standards in the groundwater with no further work required by APS. However, the water body must be in compliance with all surface water standards (review surface water sampling results to same constituents monitored in groundwater) for APS to state no further work required. Then, NPDES is satisfied since the water body is in compliance with all surface water standards. NPDES and APS would want to see surface water sampling both upstream and downstream of the potential ash pond discharge into the surface water body.

3. How does DWQ plan to address inactive sites that are not permitted and not operating e.g. give over to DWM, leave alone, monitor? If the sites are permitted and receiving waste, what are the closure requirements?

DWQ stated they would not address inactive sites but did not state if they would hand over to DWM or not. Unless there is reason to believe these inactive sites could cause groundwater or surface water impacts, they will leave them alone.

DWQ have on-site lagoon closure requirements but admit they are light on specifics and open to a wide interpretation. These interpretations would be made by the appropriate regions on site by site basis. Both APS and NPDES said they would get together internally to discuss closure requirements for ash ponds. They did not state by when they would issue closure requirements for ash ponds.

4. Does DWQ plan to incorporate groundwater monitoring for active sites into NPDES permits? If so, at what point – mid-stream of the permitting cycle, volunteer only, etc.?

Debra Watts stated she wanted to see groundwater monitoring incorporated into NPDES permits once exceedances are recorded at the review boundary. She stated the NPDES permit would not incorporate all groundwater monitoring wells nor all constituents but would be captured into the permit in some form. Both PEC and Duke were not in favor. We stated that the voluntary approach now had lost all flexibility

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once within a permit. Examples were groundwater results must be sent to DENR within 30 days or an NOV is issued. NPDES submittals require signatory authority. These arbitrary barriers could lead to NOV's and both companies are adverse to NOV's. Also, any changes to the monitoring program would now require a permit modification with public comment. Many PEC and Duke sites just completed their 5 year NPDES permit cycle and would not want to open the permit to incorporate groundwater monitoring. Plus when the permit is opened, much could change besides the addition of groundwater monitoring. Debra Watts stated she was not aware of these concerns and states she may re-think the requirement to have groundwater monitoring within the NPDES permit. She indicated that her concerns over access to the data might be adequately addressed with a software change.

At this time, Ted Bush and George Everett had to leave to attend meetings at the legislature building. As the remaining questions only pertained to APS, Matt Matthews and Sergei Chernikov exited the meeting.

5. "Location of waste disposal areas and other potential sources of contamination at the site."
Does this include all contamination not associated with CCP sites, e.g. oil spills?

DENR was satisfied with the information that PEC and Duke Energy supplied APS back in April 2009. Both companies stated that since the request for information from DENR was CCP related, we only submitted information on active, semi-active and inactive CCP sites and this was sufficient for DENR.

6. Well data (site-by-site basis). DWQ observations and recommendations.

Eric Smith had comments on a site-by-site basis for both companies. Most of the comments related to the fact that the wells were not at the review boundary (between waste boundary and review boundary) and that the well screens were below the groundwater elevation (this might result in a stagnant layer of water above the screen that could affect low flow sampling results). Eric did not have the comments for both companies in writing but stated he would provide both companies the comments in writing shortly.

7. Water quality data (site-by-site basis). DWQ observations and recommendations.

Due to time issues, the question was not discussed in great detail. Any comments from DENR would be incorporated into Eric Smith's comments.

8. Recommended definition of waste boundary – acceptable or not acceptable?

Debra Watts stated that she discussed with the various DENR regions our definition of the waste boundary, the starting point for determining the location of review and compliance boundaries. We stated in our April 2009 submittal to DENR that the waste boundary should not be at the edge of water adjacent to a dam, but at the downstream toe of the dams and dikes. DENR has decided to accept this position and therefore, significant additional distance is provided to allow for compliance with groundwater quality standards downgradient from dams. Also, PEC does not have to change the location of the waste boundary, nor review and compliance boundaries as shown in the April 2009 submittal to DENR. One note: DENR does want to see the waste boundary along with the review and compliance boundaries circle the entire ash pond. This will require that PEC Asheville Plant, Mayo Plant and Sutton Plant figures to be updated at some point. Cape Fear, Lee and Weatherspoon figures will not require changes for this issue.

9. Compliance boundaries that overlap with other permitted sites or fall into surface water.

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Duke Energy has a few sites where compliance boundaries overlap. APS stated they were not too concerned, as long as the well was within a compliance boundary, they would not require additional work. Duke Energy stated DSW viewed this differently. This topic would be discussed when George Everett and Cam Wheeler meet with DENR Solid Waste and Water Quality.

It was discussed already that APS would be open to monitoring the surface water body when the compliance boundary falls into an adjacent water body. However, Debra Watts did state you would still have to follow 2L for sites where a surface water body is just beyond the compliance boundary and wells at the compliance boundary show 2L exceedances. Our Asheville Plant is a potential example of this situation. The French Broad River is just beyond the compliance boundary but we don't yet have wells at the compliance boundary. The group did discuss that 2L has options that can be explored such as variances from 2L, monitoring the surface water body and modeling rather than pump and treat to remedy exceedances at the compliance boundary.

**DWQ AND PROGRESS ENERGY/DUKE ENERGY MEETING
AGENDA**

July 23, 2009

<u>Timeframe</u>	<u>Topics to Discuss</u>
10:00 to 11:00	<p>Division discussion</p> <p>1. Is it feasible to evaluate the entire power plant site for compliance as one source rather than on an individual site-by-site basis (e.g. land fills, active ash ponds, inactive ash ponds, etc.)</p> <p>2. Is it feasible to evaluate these same sites on a risk-based approach rather than on a 2L basis (does DWQ support or not support). Additionally, if groundwater is discharging to surface water, but the surface water still meets NPDES limits, is this acceptable?</p> <p>3. How does the DWQ plan to address inactive sites that are not permitted and not operating e.g. give over to DWM, leave alone, monitor? If the sites are permitted and receiving waste, what are the closure requirements?</p> <p>4. Does DWQ plan to incorporate groundwater monitoring for active sites into NPDES permits? If so, at what point – mid-stream of the permitting cycle, volunteer only, etc.</p>
11:00 to 12:00	<p>Follow-up items to June 4th Meeting:</p> <p>✓ 5. "Location of waste disposal areas and other potential sources of contamination at the site." Does this include all contamination not associated with CCP sites, e.g. oil spills?</p> <p>✓ 6. Well data (site-per-site basis). Discussion on well locations, well construction, etc.</p> <p>✓ 7. Water quality data (site-per-site basis). DWQ observations and recommendations</p> <p>✓ 8. Recommended definition of waste boundary – acceptable or not acceptable? <i>regions comfortable w/ this approach</i></p> <p>✓ 9. Compliance boundaries that overlap with other permitted sites or fall into surface water</p>

2029 Century Park East, Suite 1080
Los Angeles, CA 90067
T +1 424-703-3067
M +1 310-486-6520
mwilliams@nathaninc.com
NATHANINC.COM

Marcia E. Williams

SENIOR VICE PRESIDENT

OVERVIEW

Ms. Williams has played a significant role in both the public and private sectors in the development, implementation and enforcement of federal and state regulatory programs, holding particular expertise in the solid and hazardous waste fields. She has specialized in helping regulated entities establish and strengthen EHS management programs, respond proactively to upcoming regulations and legislation, and improve the cost-effectiveness of EHS program implementation. In a distinguished 18-year career with the USEPA, she held senior management positions in multiple USEPA offices. She also held senior management positions at Browning-Ferris Industries and served as a member of the Board of Directors of Safety-Kleen Corporation. Ms. Williams has provided expert testimony in a wide range of litigation matters including insurance coverage cases, contract disputes, CERCLA cost recovery actions, toxic tort cases, federal and state civil and criminal enforcement matters, and NAFTA cases.

CONSULTING EXPERIENCE

Ms. Williams has managed projects ranging in size from \$50,000 US to over \$2,500,000 US. Her practice focuses on the following four areas:

REGULATORY EXPERT AND LITIGATION SUPPORT

Ms. Williams has served as a consulting and testifying expert in the areas of solid and hazardous waste regulations and practices, chemical and pesticide regulation under TSCA and FIFRA including PCB regulation, the regulatory process, the evolution of risk assessment and risk management applied to environmental regulation, the historical evolution of environmental knowledge and regulations, standard of care applied to particular waste and chemical management practices, the extent to which remedial activities are consistent with the National Contingency Plan, and evolution and design of environmental management systems. Ms. Williams has testified in approximately 40 cases and has also been engaged in numerous additional matters that have not resulted in testimony. In addition to serving as an expert, Ms. Williams has managed litigation support projects including analyses of underlying case facts, chronologies of relevant regulatory history, comparative analyses of other enforcement actions, estimation of settlement costs, and development of case settlement strategies and proposals.

Representative Litigation Support Engagements (not involving expert testimony):

- For a large telecommunications firm, part of the legal negotiating team that achieved a settlement with the government providing multi-million dollar credit for the development of an enhanced environmental management system.

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- For an aluminum company, development of the expected value cost of site remediation that contributed to the settlement of a contract dispute case.
- For an automotive/aerospace firm, identification of underlying case facts, development of potential regulatory defenses, and participation in developing and successfully implementing settlement strategies.

ENVIRONMENTAL PERFORMANCE ASSESSMENT AND IMPROVEMENT

Ms. Williams has performed over 50 environmental, health, and safety management system projects in virtually every industrial sector as well as in public sector agencies. These projects have included evaluation of existing systems, design of new or enhanced system components, and development of EHS management systems from the ground up. Areas of focus include effective translation of complex EHS requirements into job-based specifications, assessment of management commitment and leadership applied to EHS, development of effective performance metrics, development of cost-effective performance verification tools, design of tools to address management of change, evaluation of the effectiveness of organizational structure and communication flows, development of accountability tools, resource assessments, and contractor/vendor management. Ms. Williams has lectured and written articles on EHS management system approaches and has provided expert testimony on EHS management system issues.

Representative EHS Management Engagements:

- For an automotive manufacturer, design of a successful management program at corporate and field level to ensure compliance with hazardous material transportation regulations.
- For a municipal water and wastewater agency, design of an environmental management system that achieved high rates of compliance with a wide range of environmental requirements.
- For a telecommunications firm, assessment of the adequacy of existing environmental resources and prioritization of needed supplemental resources.

STRATEGIC ENVIRONMENTAL COUSELING AND POLICY SUPPORT

Ms. Williams has performed numerous consulting engagements designed to address specific complex compliance, permitting, and remedial challenges including strategies for interacting with government entities. She has also performed environmental policy

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support to clients in the areas of impact analysis of upcoming environmental regulation and legislation, assessment and integration of acquisitions, closure or divestiture of facilities, facility siting, regulatory and legislative strategy to achieve business objectives, benchmarking of industry practices, and enforcement settlement strategy.

Representative Engagements:

- For a group of PRPs at a regional groundwater site, identified additional PRPs and evaluated allocation and cost recovery issues.
- For a petroleum company, performed probabilistic cost analysis of the company's largest remedial projects to design a strategy that would keep annual remedial payments at a stable level.
- For a diversified manufacturing company, evaluated the projected staffing needs for the corporate remedial group over the next decade, examining organizational options for improving cost-effectiveness.
- For a chemical company, evaluated the regulatory consequences of importing/exporting secondary materials for use in production when those materials were regulated as wastes in the EU.
- For a telecommunications firm, designed and implemented a benchmarking program focused on identifying best practices in several key EHS areas for companies with large numbers of non-manufacturing locations.
- For a recycling firm, evaluated the cost impacts of statutory use restrictions on the use of chlorinated solvents.

CORPORATE EXPERIENCE

ENVIRONMENTAL POLICY AND PLANNING, BFI (1988-1991)

- As Chair of Environmental Policy Committee for the second largest waste management company in the world, with \$3 billion in annual revenues, built environmental management framework, developed environmental policies for operating subsidiaries and communicated company environmental accomplishments.
- Crafted major market development strategies by analyzing and forecasting environmental trends, e.g., landfill markets in the 1990s, oil and gas waste management markets and California recycling markets and composting markets.

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- Helped operating managers resolve environmental conflicts arising in permit hearings, siting decisions, regulatory interpretations and enforcement actions.
- Established proactive environmental regulatory and legislative program, saving substantial resources and allowing company to advance legislation or regulatory change on critically important issues such as interstate movement of waste, rate regulation, solid waste planning and disposal fees.

ENVIRONMENTAL AND REGULATORY AFFAIRS, CECOS INTERNATIONAL, BFI SUBSIDIARY (1988-1989)

- Developed zero defect environmental plan for 14 hazardous waste operating sites.
- Managed all aspects of compliance, audit, permitting, and remedial program.

LOS ANGELES, RECYCLING PROGRAM, BFI (1990-1991)

- Designed program to expand BFI's recycling operations in the Los Angeles market.

BOARD OF DIRECTORS, SAFETY KLEEN CORPORATION (1995-1998)

- Provided oversight on corporate government and strategic direction.
- Chaired environmental committee of the Board.

GOVERNMENT EXPERIENCE

USEPA OFFICE OF SOLID WASTE (SEPTEMBER 1985-FEBRUARY 1988)

- Directed 250-person, \$40 million annual program to implement the 1984 Hazardous and Solid Waste Amendments, which required issuing over 70 new, controversial rules in three years. Received USEPA's distinguished career award.
- Regularly represented USEPA before Congress, states and trade associations as well as to senior government officials in Japan, Australia and India.

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USEPA OFFICE OF PRETICIDES AND TOXIC SUBSTANCES (DECEMBER 1983-SEPTEMBER 1985)

- Managed day-to-day operations of OPTS, a 1,400+ person organization responsible for regulating pesticide and chemical use. Received President's Meritorious Rank Award for significant improvements in the office's workings.
- Led US delegation on international chemical activities for more than three years.

USEPA OFFICE OF TOXIC SUBSTANCES (JANUARY 1981-DECEMBER 1983)

- Managed 400-person office responsible for new and existing chemical reviews (including regulations on PCBs and asbestos under Toxic Substances Control Act). Received William A. Jump Award for Excellence in Public Administration.
- Chaired US delegation to OECD Chemicals Group.

USEPA OFFICE OF PESTICIDES (APRIL 1979-JANUARY 1981)

- Developed major agency actions to cancel or restrict pesticides such as EDB, toxaphene, lindane and wood preservatives. Crafted the process for re-registering all pesticides.

USEPA OFFICE OF PLANNING AND EVALUATION (MARCH 1978-APRIL 1979)

- Built from scratch the first high-level, centralized statistical evaluation office in USEPA, which became instrumental in reviewing all major agency regulations for data quality.

USEPA OFFICE OF MOBILE SOURCE AIR POLLUTION CONTROL (SEPTEMBER 1972-MARCH 1978)

- Supervised Inspection/Maintenance program and development of test procedures and emission factors for light and heavy-duty vehicles, including fuel economy driving test. Awarded USEPA Bronze Medal.

Marcia E. Williams
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USEPA OFFICE OF RESEARCH AND DEVELOPMENT (SEPTEMBER 1970–
SEPTEMBER 1972)

- Performed statistical analyses and mathematical modeling to support ambient air quality standards.

OTHER RELEVANT
EXPERIENCE

- Member, Relative Risk Reduction Strategies Committee, Science Advisory Board, USEPA (1989 – 1990).
- Consultant to USEPA Science Advisory Board (1995-1998).
- Member, Science and Technology Research Priorities for Waste Management in California, prepared for California Integrated Waste Management Board (1992).
- Participant, Landfill Capacity and Siting Issues in California, California Integrated Waste Management Board (1994).
- Member, National Academy of Sciences Subcommittees on hazardous wastes, hazardous materials and groundwater contamination (1992 – 1998).
- Testimony before the US Congress on 12 occasions from 1983 – 1995.
- USEPA’s National Advisory Committee for Policy and Technology, Subgroups on Wastes and Chemicals (1993 – 1996).
- Headed US delegation to OECD Chemicals Group (1980 – 1985).

EDUCATION

Dickinson College
B.S., Math and Physics, *Summa Cum Laude*, Phi Beta Kappa, 1968
University of Maryland
Graduate Work, Math and Physics, 1969

PREVIOUS
EMPLOYMENT

Consulting (1991 – 2010)
LEGC, LLC
PA Consulting Group, Inc.
PHB Hagler Bailly, Inc.
Putnam, Hayes & Bartlett
Williams & Vanino
Corporate (1988 – 1998)

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Browning-Ferris Industries
Safety-Kleen Corporation

Government (1970 – 1988)
US Environmental Protection Agency (USEPA)

PUBLICATIONS

“Integrated Municipal Solid Waste Management,” *Handbook of Solid Waste Management*, McGraw-Hill (1994).

“Landfills: Old Remedy with New Challenges,” *Forum for Applied Research and Public Policy* (Spring 1992).

“Why-and How to-Benchmark for Environmental Excellence,” *Total Quality Environmental Management* (Winter 1992/93).

“Strategies for Managing Present and Future Waste,” presented in *Risk Analysis* (1991).

“Rethinking RCRA for the 1990’s,” *Environmental Law Reporter* (February 1991) 10,068–10,075.

“Using Cross-functional Teams to Integrate Environmental Issues into Corporate Decisions,” *Proceedings of January 1991 Corporate Quality/Environmental Management Conference*.

“Environmental Protection Agency Actions to Stimulate Use of Biotechnology for Pollution Control and Cleanup,” *Environmental Biotechnology: Reducing Risks from Environmental Chemicals Through Biotechnology*, edited by G. Omenn (Plenum Press, 1988), 373–380.

“Policy Improvements to Encourage Soil and Groundwater Remediation,” *Groundwater and Soil Contamination Remediation: Toward Compatible Science, Policy and Public Perception*, Report on a Colloquium Sponsored by the National Research Council Water Science and Technology Board (1990) 195–205.

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EXPERT TESTIMONY LIST

- United States of America v. Recticel Foam Corporation, United States District Court, Eastern District of Tennessee, Greenville, Case # CR-2-92-78
- Brunswick Pulp & Paper Co. v. Marcus E. Collins, Sr., Revenue Commissioner, and the State of Georgia, Superior Court for the County of Glynn, State of Georgia, Case # 9400646
- Aluminum Company of America, et al. v. Accident & Casualty Insurance Co., et al., Superior Court of Washington (King County), Case # 92-2-28065-5
- Mark W. Gregory, et al. v. Chemical Waste Management, Inc., United States District Court, Western District of Tennessee, Case # 93-2343-4BRO
- Williston Basin Interstate Pipeline Co. v. Rockwell International Corporation, Montana Thirteenth Judicial District Court
- CIBA-GEIGY Corp. v. Liberty Mutual Insurance Company, Superior Court of New Jersey, Law Division, Union County, Case # L-97515-87
- Cornerstone Realty v. Dresser-Rand, United States District Court, Connecticut, Case # 394CV01560 (DJS)
- Adams et al. (Simmons) v. Chevron et al., United States District Court for the Southern District of Texas, Houston Division, Case # H-96-1462
- Ormet Primary Aluminum Corporation v. Wausau Insurance Companies, et al., Court of Common Pleas, Monroe County, Ohio, Case # 95-103
- Reserve Environmental Services, Inc. v. Detrex Corp. et al., United States District Court for the Northern District of Ohio (Eastern Division), Case # 4: 93-CV-1157
- Southern Pacific Rail Corporation v. Certain Underwriters at Lloyd's London, et al., Los Angeles Superior Court, Case Number: BC 154722
- Dana Corporation v. Hartford Accident & Indemnity Company, et al., No. 49D01-CP-0026
- Metalclad Corporation v. The United Mexican States, ICSID Case No. ARB(AF)/97/1
- Maertin v. Armstrong World Industries, United States District Court for the District of New Jersey, Civil Action No. I-95-cv 02849 (JBS)
- Inland Paperboard and Packaging, Inc. vs. Affiliated FM Insurance Company, et al., Cause No. 49D05-9708-CP-1142 (State of Indiana)
- PPG Industries, Inc. v. Accident Casualty Insurance Company of Winterhur, et al., Dkt. No. HUD- L-1845-95 (New Jersey Superior Court, Law Div., Hudson County)

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- Re-Claim Environmental v. State of Louisiana, Proceedings under Louisiana APA, La. R.S. 49:950 et seq., Consolidated Compliance Order & Notice of Potential Penalty WE-CN-99-0042
- Matheny, et al. v. International Paper Co., et al., Civil Action No. CV-99-804
- Appeal of Empire Management Systems, Inc., ASBCA No. 46741, Under Contract No. F44650-88-C- 0004; April, 2001
- United Technologies Corp., et al. v. American Home Assurance Company, Docket No.: 292-CV- 00267 (JBA)
- Hillary Thomas, et al., v. Conoco, Inc., et al., No. 98-5567 (14th Judicial District, Parish of Calcasieu, State of Louisiana)
- Redlands Tort Litigation, RCV 31496, Superior Court of the State of California for the County of San Bernardino
- State of New Mexico, et al. v. General Electric Company, et al., Case Nos. CV 99-1118 BSJ/KBM and CV 99-1254 BSJ/LFG (consolidated by Order on 6/14/00), United States District Court for the District of New Mexico
- Associated Indemnity Corporation and The American Insurance Company v. The Dow Chemical Company, No. 99 CV 76397, United States District Court for the Eastern District of Michigan, Northern Division
- Eli Lilly and Company v. The Aetna Casualty and Surety Company, et al., State of Indiana, County of Marion in the Marion Superior Court, Cause No. 49D12 0102 CP 000243
- Lockheed Martin Idaho Technologies Company v. Lockheed Martin Advanced Environmental Systems, Inc. and Lockheed Martin Corporation v. EG&G Idaho, Inc., Cause No. CIV98-0316-E- BLW (D. Idaho)
- Carol Antolovich, et al. v. Brown Group Retail, Inc., et al., District Court, City and County of Denver, State of Colorado, Case Number: 00CV 1021, February 12, 2003 and March 28, 2003
- Alcoa Inc. v. Accident and Casualty Insurance Co., et al., Superior Court of the State of Washington, County of King, Case No. 92-2-28065-5 (SEA-Consolidated) 2003, Deposition April 9 and 10, 2003 and May 28, 2003
- City of Modesto v. Dow Chemical Co., et al., Superior Court of the State of California in and for the County of San Francisco, Case Nos. 999345 and 999643, Deposition November 19 and 20, 2003
- USEPA Region 5 v. General Motors Automotive - North America, Docket No. RCRA-05-2004-0001, Trial testimony

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- Allgood, et al. v. General Motors Corporation, United States District Court, Southern District of Indiana, Indianapolis Division, Case No. IP02-1077-C-H/K
- King, et al. v. Hamilton Sundstrand Corporation, District Court, Adams County, Colorado, Case No. 02 CV 2018, Deposition March 31, 2006
- Drummond, et al. v. E.I. Du Pont de Nemours and Company, Circuit Court of Harrison County, West Virginia, Civil Action No. 05-C-148-1, Deposition November 27, 2006
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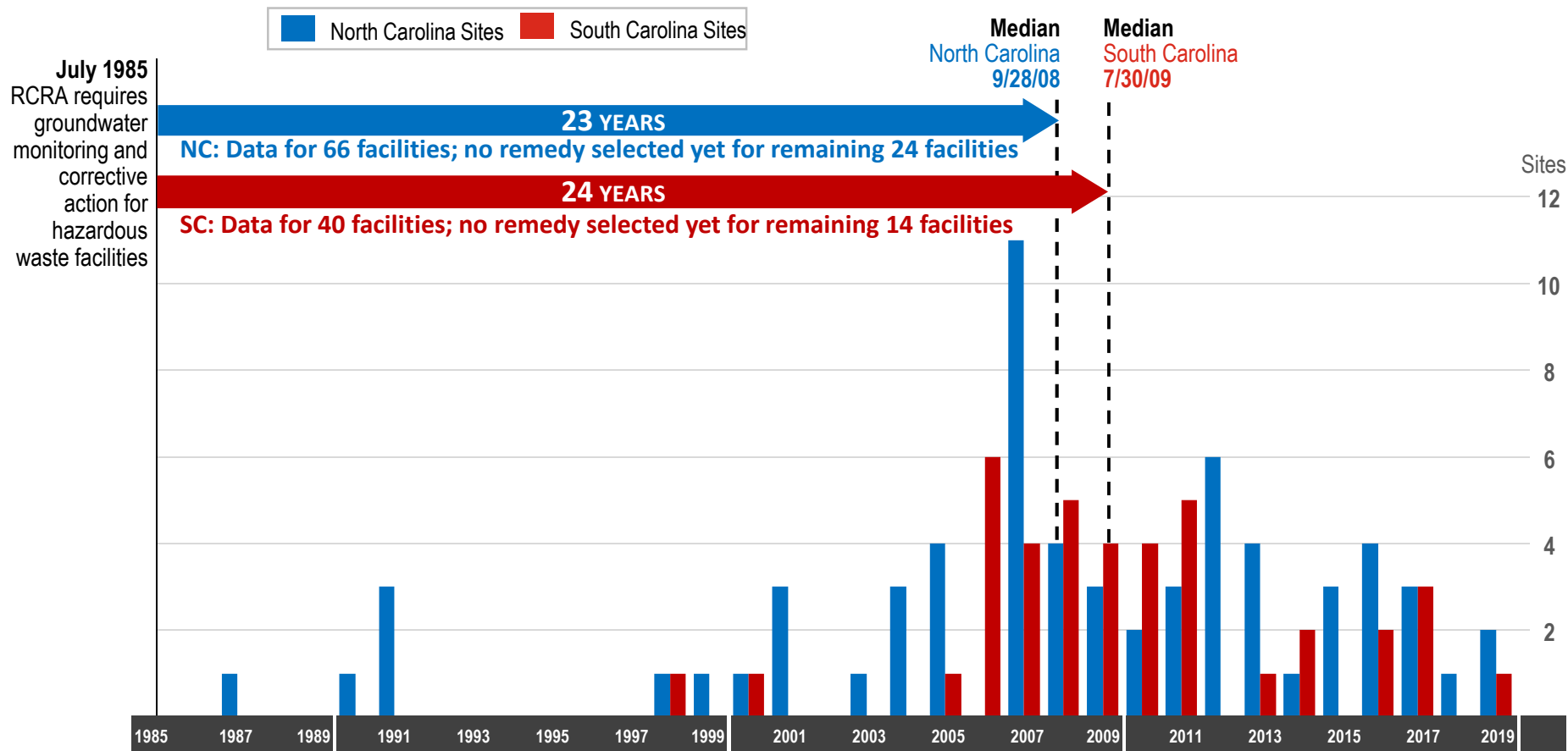
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RCRA Hazardous Waste Corrective Action Facilities - Remedy Selection Date



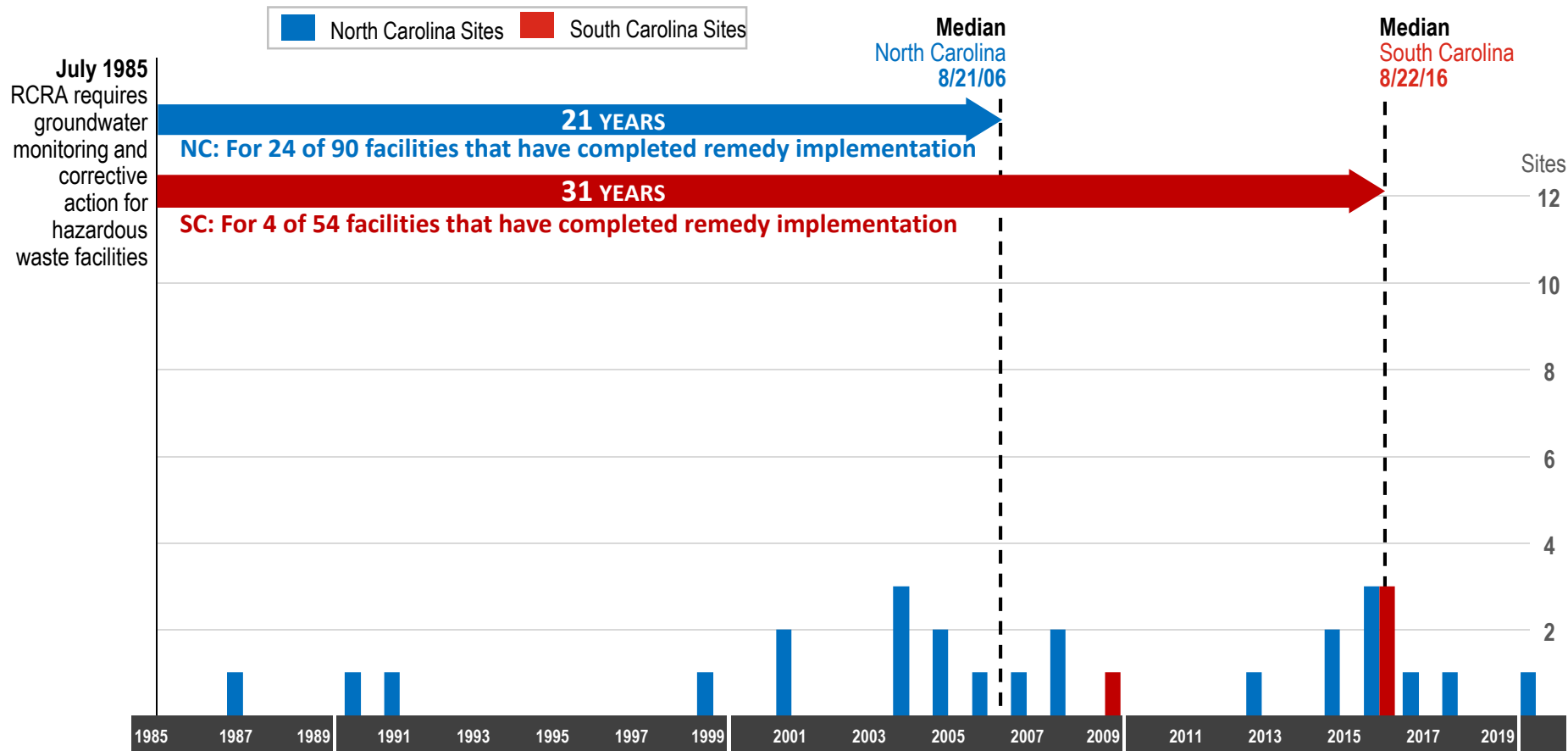
NC has 90 hazardous waste corrective action facilities

SC has 54 hazardous waste corrective action facilities

Remedy Selection Date (CA400) defined by EPA as date the State or EPA formally selects a remedy designed to meet long-term goals of protection of human health and the environment.

Data obtained on March 9, 2020 from <https://ofmpub.epa.gov/apex/cimc/f?p=100:15:::NO:RIR,CIR::>

RCRA Hazardous Waste Corrective Action Facilities - Remedy Completion Date



NC has 90 hazardous waste corrective action facilities
SC has 54 hazardous waste corrective action facilities

Remedy Completion Date (CA999 and CA900) defined by EPA as the date remedy has been fully implemented and associated performance standards are attained or date that corrective action process terminated because all required activities are completed.

Data obtained on March 9, 2020 from <https://ofmpub.epa.gov/apex/cimc/f?p=100:15:::NO:RIR,CIR::>