

INFORMATION SHEET

PRESIDING: Commissioner Clodfelter, Presiding; Chair Mitchell, Commissioners Brown-Bland,
Gray, Duffley, Hughes, Clodfelter

PLACE: Dobbs Building, Raleigh, North Carolina

DATE: Monday, March 9, 2020

TIME: 7:00 p.m. to 7:58 p.m.

DOCKET NOS.: E-100, Sub 157

COMPANY: Duke Energy Progress, LLC, Duke Energy Carolinas, LLC,
Dominion Energy North Carolina

DESCRIPTION: In the Matter of 2018 Biennial Integrated Resource Plans
and Related 2018 REPS Compliance Plans

APPEARANCES

(See attached.)

WITNESSES

(See attached.)

EXHIBITS

(See attached.)

COPIES ORDERED: Email: Edmondson, Luhr, Cummings

REPORTED BY: Linda Garrett

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1 A P P E A R A N C E S:

2 FOR DUKE ENERGY CAROLINAS AND

3 DUKE ENERGY PROGRESS:

4 Lawrence B. Somers, Esq.

5 Deputy General Counsel

6 Duke Energy Corporation

7 P.O. Box 1551/NCR 20

8 Raleigh, North Carolina 27602

9

10 FOR DOMINION ENERGY NORTH CAROLINA:

11 Nicholas A. Dantonio, Esq.

12 McGuireWoods, LLP

13 501 Fayetteville Street

14 Suite 500

15 Raleigh, North Carolina 27611

16

17 FOR THE USING AND CONSUMING PUBLIC:

18 Lucy Edmondson, Esq.

19 Nadia Luhr, Esq.

20 Layla Cummings, Esq.

21 Public Staff

22 North Carolina Utilities Commission

23 4326 Mail Service Center

24 Raleigh, North Carolina 27699-4300

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T A B L E O F C O N T E N T S

E X A M I N A T I O N S (Cont'd.)

PAGE

ANNE LAZARIDES

Statement.....42

Examination by Chair Mitchell.....47

Examination by Commissioner Brown-Bland.....49

Examination by Commissioner Clodfelter.....51

CATHY BUCKLEY

Statement.....53

E X H I B I T S

IDENTIFIED/ADMITTED

Richmond Exhibit 1.....17/17

Evarts Exhibit 1.....33/33

Kaufman Exhibit 1.....41/41

**NORTH CAROLINA UTILITIES COMMISSION
APPEARANCE SLIP**

DATE: 3/9/20 DOCKET NO.: E-100, Sub 157
ATTORNEY NAME and TITLE: Lawrence B. Sowers, Deputy General Counsel
FIRM NAME: _____
ADDRESS: _____
CITY: _____ STATE: _____ ZIP CODE: _____
APPEARING FOR: Duke Energy Carolinas + Duke Energy Progress

APPLICANT: COMPLAINANT: ___ INTERVENOR: ___
PROTESTANT: ___ RESPONDENT: ___ DEFENDANT: ___

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APPEARANCE SLIP**

DATE: 3.9.20 DOCKET NO.: E-100 sub 157

ATTORNEY NAME and TITLE: Nick Dantonio

FIRM NAME: McGuireWoods

ADDRESS: 501 Fayetteville Street Suite 500

CITY: Raleigh STATE: NC ZIP CODE: 27611

APPEARING FOR: Dominion Energy North Carolina

APPLICANT: ___ COMPLAINANT: ___ INTERVENOR: ___

PROTESTANT: ___ RESPONDENT: ___ DEFENDANT: ___

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NORTH CAROLINA UTILITIES COMMISSION
PUBLIC STAFF - APPEARANCE SLIP

DATE March 9, 2020 DOCKET #: E-100, Sub 157

PUBLIC STAFF MEMBER Lucy Edmondson and Nadia Luhr *Layla Cummings*

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LEGAL lucy.edmondson@psncuc.nc.gov and nadia.luhr@psncuc.nc.gov *layla.cummings@psncuc.nc.gov*

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Richmond & h1
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Comments by Harvey M. Richmond

My name is Harvey Richmond and I reside at 200 Ivygreen Chase Ct. in Apex. I am a retired environmental analyst who worked on national air quality standards for over 30 years with the U.S. EPA.

I am hear to urge the Commission to send Duke Energy's IRP back to the drawing boards.

Duke Energy's target for the amount of renewable energy that would be available 15 years from now is woefully inadequate. More than a decade ago, Duke Energy placed solar panels on the EPA/NIEHS childcare center in RTP. Then a few years later it placed solar panels on one of the wings of EPA's research center on the RTP campus where I worked. If one watches TV or listens to radio, one sees and hears numerous ads where Duke makes it look like they are fully invested in solar and renewable energy. In reality Duke has slowed down the installation of new solar in this state and has lobbied for measures that impede the installation of solar and wind energy.

NC used to be a leader in the Southeast for developing renewable energy through the REPS provisions. Now the state has dropped 9 spots and is number 30 in a scoring of how states are doing on renewable energy. Our neighbors to the north (Virginia) and South (South Carolina) are racing ahead to promote solar energy and battery storage. In the meantime

Duke's plan is to build a lot of new gas-fired power plants over the next 15 years. This would lock in higher emissions of methane, a greenhouse gas that is over 80 times more potent than carbon dioxide in impacting our climate. If we are to have any hope of meeting the Paris Climate goals and NC's climate goals, the Commission needs to stop any new gas-fired plants. Contrary to the propaganda put forward by Duke Energy and others, fracked gas is not a bridge fuel.

Instead of replacing coal fired power plants with gas-fired ones, Duke Energy needs to aggressively support the installation of solar energy combined with battery storage. Duke should be putting solar energy on school rooftops, on big box stores like Walmart and Target, on churches and municipal buildings. Solar energy combined with battery storage is both less expensive and safer than the alternatives. There is no such thing as a solar spill or solar energy explosion. Solar with battery storage doesn't threaten the water quality and livelihoods of residents, in contrast to the Atlantic Coast and Mountain Valley Pipelines which threaten vulnerable populations and the environment.

In conclusion, I urge the Utilities Commission to do what is best for the public, and insist that Duke significantly revise its IRP to meet the needs of its customers and to ensure that it does its part in addressing climate change.

Thank you for the opportunity to provide these comments this evening.

Testimony of Dale Evarts to the North Carolina Utilities Commission
Duke Energy Integrated Resource Plan (Docket E-100 Sub 157) March 9th, 2020

Thank you for your service in the important role of managing the energy system for North Carolina. My name is Dale Evarts, I'm a Duke Energy Carolinas customer, and until recently, I led the Climate and International Group at the Environmental Protection Agency in the Research Triangle Park. We dealt with the impacts of climate change on air quality, and worked to reduce air pollution and climate change in the U.S. and globally.

I'm also testifying on behalf of my colleague, Drew Shindell, Distinguished Professor of Earth Sciences at Duke University and a coordinating lead author at the Intergovernmental Panel on Climate Change (IPCC), the world's leading organization for climate science.

In a letter to Governor Cooper this fall, Dr Shindell and I, along with 25 former EPA scientists, engineers and policy experts, proposed a moratorium on new natural gas infrastructure, including power plants, pipelines and pump stations. Why? We said that it would help him achieve the goals of North Carolina's Clean Energy Plan by:

- 1) Creating a healthier, safer, more equitable and resilient energy system for our state; and
- 2) Saving money for North Carolina's ratepayers.

I will speak to the health and climate issues, and another co-author of this letter, Kathy Kaufman, will speak to the savings.

Creating a healthier, safer, more equitable and resilient energy system for our state

Methane is the key constituent of natural gas and 100 times more effective than carbon dioxide in trapping heat. It is the largest contributor to the current failure to keep the world on an emissions path that achieves the global target of 2°C of warming. Recent research shows that the U.S. fracking boom is likely an important contributor to the recent surge in atmospheric methane.¹

Methane is also a precursor to ozone, a potent air pollutant that harms human health. Analyses by Dr. Shindell and his colleagues indicates that the roughly 330 million tons of methane emitted globally each year due to human activities lead to ~165,000 premature deaths, including 10,000 in the US and several hundred in North Carolina. Ozone also reduces soybean, corn and wheat production. Accounting for the health and environmental costs, methane has about 50 times the impact of CO₂.²

The good news is that methane lasts only about a decade or so in the atmosphere (compared to a century or more for carbon dioxide). So reducing methane emissions now means less heat trapped now and less ozone smog to affect our health and agriculture.

¹ Howarth, R. Ideas and perspectives: is shale gas a major driver of recent increase in global atmospheric methane? Biogeosciences, 16, 3033-3046, <https://doi.org/10.5194/bg-16-3033-2019>, 2019.

² Shindell, D., J. S. Fuglestedt, W. J. Collins, The Social Cost of Methane: Theory and Applications, Faraday Disc., 200, 429-451, doi: 10.1039/C7FD00009J, 2017.

Testimony of Dale Evarts to the North Carolina Utilities Commission

Duke Energy Integrated Resource Plan (Docket E-100 Sub 157)

March 9th, 2020

The people most affected by methane gas are North Carolinians who are contributing the least to the climate and air quality problems: low income communities and communities of color. Halting the expansion of methane gas infrastructure helps to meet the equity and just transition principles embodied in North Carolina's Clean Energy Plan. Farmers and rural communities will not have to give up their land for pipelines, and communities of color will not have to live next to polluting pump stations. All ratepayers will be able to enjoy the savings and health benefits of resilient, carbon free sources of energy.

Advances in wind and solar, paired with battery storage, are giving us a healthier, faster and cheaper way to get to a distributed and more resilient energy system. With battery storage projected to rapidly become a standard industry practice, we can be equipping buildings and homes with solar-plus-storage instead of spending billions on an electricity grid and methane gas system that is expensive and increasingly obsolete.

I respect the engineers and experts at Duke Energy who I have worked together with during the stakeholder processes to develop and now implement the North Carolina Clean Energy Plan. Duke Energy is full of good people who want to be partners in developing a healthy, safe, resilient and carbon-free energy future for North Carolina, and we definitely need them and their expertise.

But the Duke Energy IRP doesn't reflect that partnership. It prioritizes reliance on dangerous and costly methane gas. We lag behind what other utilities are doing around the country. Please look closely at what they are proposing to do and require Duke Energy to be a partner, rather than an obstacle, in creating the carbon free energy future for NC envisioned in our Clean Energy Plan.

Thank you for your time and attention.

October 10, 2019

Governor Roy Cooper
North Carolina Office of the Governor
20301 Mail Service Center
Raleigh, NC 27699-0301

cc: Jeremy Tarr, Policy Advisor to Governor Cooper

Subject: Important Considerations for North Carolina's Clean Energy Plan

Dear Governor Cooper:

The DEQ and its partner agencies have done a commendable job leading a stakeholder process and translating E080, issued by you last fall, into recommended plans and actions. The Clean Energy Plan provides a pathway to move North Carolina far along in its efforts to transition to a clean energy economy. Implementation of recommendations will be a significant challenge. However, even if everything laid out in the Plan is completed, North Carolina will still fall short in addressing climate change at the level needed, especially since it allows continued reliance on natural gas. What follows pertains to natural gas and methane and raises issues that will be critical to consider as you move forward to implement the plan.

The world's scientists, in the form of the Intergovernmental Panel on Climate Change (IPCC), tell us that we need to achieve net zero carbon dioxide emissions by 2050 in order to have a substantial chance of keeping warming to a safe level. I was a Coordinating Lead Author on the panel's Special Report that reached that conclusion.^{i,ii}

However, this reduction will be much more difficult for developing nations, so advanced countries like the U.S., that have more economic and technological capacity and are responsible for a much greater contribution to historic and current emissions, need to take the lead to achieve net zero earlier, around 2040.

Unless carbon capture and sequestration technology quickly becomes very cheap (and current estimates put the cost at \$2-4 trillion/year)ⁱⁱⁱ and associated hurdles

such as CO2 storage and pipeline siting are surmounted, there is no way new natural gas is compatible with the IPCC analysis.

As the state's chief supplier of electric power, Duke Energy, however, plans to build the equivalent of 30 large gas-burning power plants in North Carolina between now and 2034, the useful life of which would extend beyond 2050. In fact, Duke *increased* the amount of planned gas by 22% over the previous year in the latest planning update filed with the Utilities Commission on September 3.

While I was pleased to see that the Clean Energy Plan incorporates greenhouse gas reduction goals out to 2050, I am troubled that the Plan would not achieve the reductions that are necessary to avert the worst effects of climate change. Unless the Clean Energy Plan can envision a future without any new gas plants, it will not be a plan that protects North Carolina from the serious impacts of climate change as you intended when you issued EO80.

This is true even if we consider only the CO2 emissions from burning natural gas, since the IPCC's target of "net zero before 2050" does not allow for the addition of large new CO2 sources now.

Methane Venting & Leakage

And yet the effect of natural gas is even worse than that. It is composed mostly of methane, a greenhouse gas with a much stronger climate impact than carbon dioxide. Before being burned, some of the gas (methane) leaks and is intentionally vented during natural gas operations (drilling, storage, transport and distribution). Unfortunately, it is not possible to use natural gas without emitting methane. And if enough methane is released (as little as 1-3 percent in fracking, processing and transporting it), natural gas can be worse (potentially much worse) for the climate than coal.

Given that natural gas CO2 emissions *alone* make gas incompatible with the IPCC target, we should not need to quantify methane leakage, yet knowing the leak rate allows us to give a much more complete analysis of the real societal footprint of gas usage. My research in this area leads to the following conclusions:

- Methane has been the largest contributor to the worldwide failure to keep on an emissions trajectory consistent with a 2°C global warming target, causing 90% of the departure from such a trajectory that we have seen since 2000.^{iv} A recent paper by Robert Howarth finds that the US fracking boom is likely an important contributor to the recent surge in atmospheric methane.^v
- Methane is a precursor to ozone, which causes air quality issues and harms human health. When you take these costs into account (using a 3% discount rate), methane does \$3,700/ton in damages compared to CO2's ~\$70/ton, giving methane 50 times the societal impact of CO2. These numbers are in the process of being refined and are certain to go up as additional evidence comes in about the damaging health effects of ozone exposure. Our most recent analyses indicate that the roughly 330 million tons of methane emitted due to human activities every year (worldwide) lead to ~165,000 premature deaths around the world, including 10,000 in the US and several hundred in North Carolina.^{vi}
- I calculate that, accounting for both CO2 emitted directly and upstream methane, the societal damages due to climate change and air pollution raise the true cost of electricity generated using gas from the market cost of 4.5 cents per kWh (according to the US Dept. of Energy for 2018) to 12.2 cents per kWh.^{vii} That makes it more than double the cost of solar or onshore wind, based again on US DoE statistics.

I am pleased that North Carolina has begun to incorporate some of these costs in analyses, and in particular that the Clean Energy Plan calls on the regulators and utilities to consider the social cost of carbon, including health impacts, when calculating the relative costs of different energy resources.^{viii}

The recommendations in the Clean Energy Plan are based on modeling that includes only emissions from combustion, in other words from the power plant itself. But the bulk of methane emissions from natural gas occur before the fuel reaches the power plant. I recognize that it is not straightforward to account for upstream methane in a way that is consistent with analyses of other power sources, which should then also include emissions along the supply chain that may be outside of North Carolina, and in a way that avoids double-counting with other states. However, upstream methane emissions are significant and dangerous, even if North Carolina can't neatly account

for them, and North Carolina is responsible for the emissions because it is creating the market for the gas. This should be acknowledged in implementing the Clean Energy Plan.

Economic trends alone may be enough to reverse Duke's plans for new gas in North Carolina. With the levelized cost of natural gas now running around 4-4.5 cents/kWh,^x the City of Los Angeles just signed a solar power purchase agreement at 1.997 cents/kWh for a facility that will also include battery storage (with electricity from the batteries priced at only 1.3 cents/kWh) and is expected to supply ~7% of the city's needs.^x Other projects have similarly low prices for renewable energy. Recent analysis indicates that, due to a rapid decline in the cost of renewables, the cost of clean energy generation is likely to be lower than the cost of new gas plants for 90% of the proposed construction in the U.S. by the date those plants are expected to be placed into service.^{xi} The same analysis shows that more than 90% of proposed new gas-fired power plants are likely to be uncompetitive by 2035. This implies that, if Duke Energy does succeed in building new gas plants, these plants are very likely to end up as stranded assets, exacerbating the already thorny problem of unrecovered debt that is preventing the utility from closing coal plants. Many other recent publications have illustrated the extreme financial and climate risks associated with new natural gas.^{xii}

Recommendations

With the climate urgency we are facing, I believe that North Carolina needs a Clean Energy Plan that does more than simply trust that market forces will provide the outcome that we really need.

The Clean Energy Plan implementation process should take into account that:

- In order to meet the IPCC's 2030 and 2050 targets, ongoing economic trends and research on the impacts of methane strongly suggest that new gas plants may present an unnecessary risk to the climate and to the health of North Carolinians; and
- Regulatory impact assessments of future policies should account for methane impacts, including its social costs, life-cycle emissions of gas and other power sources, and the rapid changes in levelized cost of energy that increasingly

favor renewables plus storage over gas, and are very likely to continue to shift in that direction.

Integrated resource plans like the ones Duke Energy has put forth, dependent as they are on a buildout of power plants fueled by fracked methane gas brought to North Carolina by the proposed Atlantic Coast Pipeline and existing Transco pipeline, are inconsistent with meeting IPCC targets. In addition to causing possibly irreparable climate damage, such infrastructure is likely to saddle consumers with much greater costs than would a more rapid transition to 100% renewable energy, while also causing additional harm to already vulnerable communities.

Therefore I believe strongly that the Clean Energy Plan implementation should include:

- A permanent moratorium on new gas infrastructure in the state and
- A requirement that the investor-owned utilities account for the social cost of emissions, including in-state and upstream methane, in their Integrated Resource Plans, so that decision makers have a more accurate picture of the costs and impacts of natural gas as compared to other power generation sources.

Thank you again for your leadership on clean energy in North Carolina and the hard work that Secretary Regan, Sushma Masemore and the entire DEQ team have put forth to develop this important plan. Please let me know how I can be of assistance to you as you implement the plan and give North Carolina an energy future that truly rises to the challenges of the crisis in which we find ourselves.

Sincerely,



Drew Shindell, Distinguished Professor of Earth Sciences, Duke University

in collaboration with

Dale Evarts, former Director, Climate, International and Multimedia Group, US EPA
Kathy Kaufman, former Regulatory Analyst, Air Economics Group, US EPA

Jim Warren, Executive Director, NC WARN
Sally Robertson, Solar Projects Coordinator, NC WARN

with the support of the following North Carolina alumni of the US Environmental Protection Agency (EPA):

John Bachmann, former Associate Director of Science/Policy and New Programs, US EPA Office of Air Quality Planning and Standards

Karen Blanchard, US EPA Office of Air Quality Planning and Standards, retired

Robert J. Blaszczyk, former Environmental Engineer, US EPA Office of Air Quality Planning and Standards

Dianne Byrne, US EPA Office of Air Quality Planning and Standards, retired

Jane C. Caldwell, PhD, US EPA Office of Research and Development, retired

Jeffrey S. Clark, former Associate Director for Policy, Office of Air Quality Planning and Standards

David Cole, US EPA Office of Air Quality Planning and Standards, retired

Daniel L. Costa, Sc.D., former National Program Director for Air, Climate, and Energy Research, US EPA Office of Research and Development

Anthony B DeAngelo, PhD, US EPA Office of Research and Development, retired

Eric Ginsburg, Senior Policy Advisor, US EPA Office of Air Quality Planning and Standards, retired

Roy Huntley, US EPA Office of Air Quality Planning and Standards, retired

Martha H Keating, former Senior Policy Advisor, Health and Environmental Impacts Division, US EPA Office of Air Quality Planning and Standards

Andrew D. Kligerman, PhD, US EPA Office of Research and Development, retired

F. Elaine Manning, Environmental Engineer, US EPA Office of Air Quality Planning and Standards, retired

Julie McClintock, US EPA Office of Air Quality Planning and Standards, retired

Debdas Mukerjee, PhD, Former Senior Science Advisor, Senior Scientist

USEPA NCEA-Cin, Cincinnati, OH (now living in RTP, NC)

Ronald Myers, US EPA Office of Air Quality Planning and Standards, retired

John R. O'Connor, former Deputy Director, US EPA Office of Air Quality Planning and Standards

Joseph Pinto, PhD, USEPA, National Center for Environmental Assessment, retired, Currently Adjunct Professor, Dept. of Environmental Science and Engineering, UNC

Holly Reid, US EPA Office of Air Quality Planning and Standards, retired

Harvey Richmond, former Senior Environmental Analyst, Health and Environmental Impacts Division, US EPA Office of Air Quality Planning and Standards

R. Woodrow Setzer, PhD, US EPA Office of Research and Development, retired

Dr. Betsy Smith, US EPA Office of Research and Development, retired

William O. Ward, former Data Scientist, National Health and Environmental Effects Research Laboratory

ⁱ IPCC, Summary for Policymakers. In: Global warming of 1.5°C. An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, et al (eds.)]. World Meteorological Organisation, Geneva, Switzerland, 2018, <https://www.ipcc.ch/sr15/chapter/summary-for-policy-makers/>.

ⁱⁱ Rogelj, J., D. Shindell, J. Jiang, et al., Mitigation Pathways compatible with 1.5°C in the context of sustainable development, in Special Report on Global Warming of 1.5°C, Intergovernmental Panel on

Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2018, <https://www.ipcc.ch/sr15/chapter/2-0/>.

ⁱⁱⁱ Hansen, J. Saving Earth. June 27, 2019, https://drive.google.com/file/d/1W_f9hZ1Y-GDxbsQnfz-YoqdhYV9NbWCO/view?fbclid=IwAR3ECmnLke2A6MqRm6N6BHpEN6RWfzill8Cn1DpB6xVZFKoONxKpY1WXhVc.

^{iv} Nisbet, E. G., Manning, M. R., Dlugokencky, E. J., Fisher, R. E., Lowry, D., Michel, S. E., et al. (2019). Very strong atmospheric methane growth in the 4 years 2014–2017: Implications for the Paris Agreement. *Global Biogeochemical Cycles*, 33, 318–342. <https://doi.org/10.1029/2018GB006009>.

^v Howarth, R. Ideas and perspectives: is shale gas a major driver of recent increase in global atmospheric methane?

Biogeosciences, 16, 3033–3046, <https://doi.org/10.5194/bg-16-3033-2019>, 2019.

^{vi} Shindell, D., J. S. Fuglestedt, W. J. Collins, *The Social Cost of Methane: Theory and Applications*, *Faraday Disc.*, 200, 429–451, doi: 10.1039/C7FD00009J, 2017.

^{vii} Ibid.

^{viii} North Carolina Clean Energy Plan: Transitioning to a 21st Century Electricity System. Policy & Action Recommendations, NC Department of Environmental Quality, October 2019, https://files.nc.gov/governor/documents/files/NC_Clean_Energy_Plan_OCT_2019.pdf, p. 78.

^{ix} Energy Information Administration, *Annual Energy Outlook 2018*, US Dept. of Energy, Washington DC, 2018.

^x McMahon, J. New Solar + Battery Price Crushes Fossil Fuels, Buries Nuclear. July 1, 2019. *Forbes*. <https://www.forbes.com/sites/jeffmcmahon/2019/07/01/new-solar--battery-price-crushes-fossil-fuels-buries-nuclear/#72ec2b5a5971> and Walton, Robert. Los Angeles approves 'historically low cost' solar+storage project. September 11, 2019. *Utility Dive*. <https://www.utilitydive.com/news/los-angeles-approves-historically-low-cost-solar-storage-project/562681/>.

^{xi} Teplin, Charles et al. *The Growing Market for Clean Energy Portfolios: Economic Opportunities for a Shift from New Gas-Fired Generation to Clean Energy Across the United States Electricity Industry*. Rocky Mountain Institute, 2019, <https://rmi.org/insight/clean-energy-portfolios-pipelines-and-plants>.

^{xii} Renewables and Storage Leave No Place for Fossil Fuels (a bibliography), May 2019, <https://www.ncwarn.org/wp-content/uploads/Gas-climate-economic-risk.pdf>.

Testimony of Kathy Kaufman to the NC Utilities Commission

Duke Energy Integrated Resource Plan Docket E-100 Sub 157 March 9th, 2020

Thank you for your service on the Utilities Commission. My name is Kathy Kaufman. I am a Duke Energy Carolinas customer from Orange County. In late 2017 I retired from the US Environmental Protection Agency in RTP, NC, after 29 years as an air quality policy analyst. I led Clean Air Act regulatory efforts and coordinated economic analyses, including the employment analysis for the Clean Power Plan. Today I will focus on economic issues.

Duke Energy plans to build the equivalent of 30 large gas-burning power plants in North Carolina between now and 2034, the useful life of which would extend well beyond 2050. Along with the costly pipeline infrastructure to support this buildout, we ratepayers would be saddled with continually increasing costs at the same time that solar, wind and energy storage prices are rapidly falling.

Recent analysis indicates that, due to the rapid decline in the cost of renewables, the cost of clean energy generation is likely to be lower than the cost of new gas plants for 90% of the proposed construction in the U.S. by the date the plants are expected to begin operating (RMI, 2019). Also 90% of proposed new gas-fired power plants are likely to be uncompetitive by 2035.

As noted recently in Forbes, "These changes are already contributing to cancellations of planned natural-gas power generation...The need for these new natural-gas plants can be offset through clean-energy portfolios (CEPs) of energy storage, efficiency, renewable energy, and demand response."

These economic trends should give us all pause about Duke's plans for new baseload natural gas in North Carolina. Consider solar, wind, and battery storage.

Solar

Recently, with the levelized cost of natural gas now running around 4-4.5 cents/kWh, in 2019 the City of Los Angeles signed a solar power purchase agreement at 2 cents/kWh for a facility that will also include battery storage (at 1.3 cents/kWh) and is expected to supply around 7% of the city's needs.¹ This is indicative of trends around the country (and the world).

Wind

With respect to wind energy, DOE has also recognized that wind generation is cheaper than fossil fuel around the country, and that wind has long-term cost advantages.

According to the DOE, "as wind generation agreements typically provide 20-year fixed pricing, the electric utility sector is anticipated to be less sensitive to volatility in natural gas and coal fuel prices with more wind. By reducing national vulnerability to price spikes and supply disruptions with long-term pricing, wind is anticipated to save consumers \$280 billion by 2050."²

Right now North Carolina ratepayers are not benefiting from any of those savings.

Energy Storage

According to the respected journal *Science*, in an article titled: Giant Batteries and Cheap Solar Power are Shoving Fossil Fuels off the Grid", a 2019 analysis of "more than 7000 global storage projects by Bloomberg New Energy Finance reported that the cost of utility-scale

¹ <https://www.sciencemag.org/news/2019/07/giant-batteries-and-cheap-solar-power-are-shoving-fossil-fuels-grid>

² <https://www.energy.gov/eere/wind/wind-vision>

Testimony of Kathy Kaufman to the NC Utilities Commission

Duke Energy Integrated Resource Plan Docket E-100 Sub 157 March 9th, 2020

lithium-ion batteries had fallen by 76% since 2012, and by 35% in just the past 18 months, to \$187 per MWh. Another market watch firm, Navigant, predicts a further halving by 2030.”³

In addition, in 2018, FERC issued two new regulatory orders aimed at easing incorporation of energy storage. The precipitous drop in the price of storage is paving the way for its adoption around the country.

Storage has major advantages. It can obviate the need for expensive transmission line buildout, making adoption of solar and wind resources even more of a no-brainer in terms of costs. Critically for NC, the availability of stored energy also would enable greater resilience in the face of the more frequent storms, hurricanes, and floods we will continue to face.

Jobs

According to the most recent data from the Bureau of Labor Statistics, the two fastest growing job categories in the US are solar installer and wind turbine technician. In NC alone, according to the NC Sustainable Energy Association, in 2018 there were over 43,000 clean energy sector jobs, 2/3 of which are jobs in energy efficiency and solar energy. This is far more than employed by fossil fuel electric generation, even though the majority of our energy in NC comes from fossil fuels. Imagine the employment boom we would generate by unleashing renewable energy and energy efficiency in our state.

The bottom line

Recognizing the falling costs of renewables and storage, the Governor’s Clean Energy Plan recommends a study of the costs and benefits of wholesale and retail competition for electricity, as South Carolina is currently considering. On the wholesale side, RFPs issued by US utilities have resulted in some of the lowest costs for energy in the US.

Which begs the question: Do we really want to lock in a major buildout of natural gas plants when it is clear that ever cheaper and cleaner alternatives are being taken up around the country?

If we do choose to lock an enormous natural gas buildout, it will be at the expense of NC ratepayers. Duke Energy’s new gas plants could very well end up like its coal plants, as expensive stranded assets, with NC ratepayers stuck with the bill. A number of investment firms around the country and world, given climate risks and a future driven more and more by renewable energy, are pulling back on their investments in coal and gas. So are many utilities.

Furthermore, including the full societal damages of climate change and air pollution caused by using methane gas to generate power reveals its true cost. And the true cost of natural gas power is more than double the cost of solar or on-shore wind, using US DOE statistics.

The Governor’s Clean Energy Plan, which I participated in stakeholder meetings for, calls on regulators and utilities to incorporate some of these costs in their analyses of the relative costs of different energy resources. Knowing the true costs can help you, the Utilities Commission, hold regulated power providers to lower cost sources, such as wind, solar, storage, and efficiency. Thank you.

³ <https://www.sciencemag.org/news/2019/07/giant-batteries-and-cheap-solar-power-are-shoving-fossil-fuels-grid>