

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-2, SUB 1089

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of)	
Application of Duke Energy Progress, LLC for a)	POSITION AND
Certificate of Public Convenience and Necessity)	COMMENTS BY
to Construct a 752 Megawatt Natural Gas-Fueled)	NC WARN AND
Electric Generation Facility in Buncombe County)	THE CLIMATE TIMES
Near the City of Asheville)	

Pursuant to the Order on Procedure for Accepting Comments of the Parties, filed January 22, 2016, now come NC WARN and The Climate Times, by and through the undersigned attorney, with their statement of position and comments on the application for the certificate of public convenience and necessity (“the certificate”) by Duke Energy Progress (“DEP”) in this docket.

1. The position of NC WARN and The Climate Times is that the Commission should DENY the application for the certificate for the Asheville project for the following reasons:

a. The expedited process followed by the Commission does not allow it adequate opportunity to review the application or provide fair and reasonable regulation of DEP’s activities.

b. Too much relevant information has been withheld from public scrutiny, limiting meaningful public debate.

c. DEP has not demonstrated the need for over 700 MW of new natural gas-fired units in the Asheville area.

d. DEP's rapidly increasing reliance on natural gas-fired generation is potentially costly for DEP ratepayers, with future prices and supply for natural gas highly variable and extremely risky.

e. DEP would become an even greater contributor to climate change due to methane leakage throughout the natural gas production and distribution cycle.¹

ARGUMENT

2. In their Motion to Intervene and Motion for Evidentiary Hearing, filed December 21, 2015, NC WARN and The Climate Times moved for an evidentiary hearing on the application, questioning the expedited review process for the application. Their position was that the 45-day review period pursuant to the Mountain Energy Act of 2015, Session Law 2015-10, did not begin to run until the Commission determined it had all relevant information before it, and the only way to do so was to hold an evidentiary hearing. The Commission denied the motion on January 15, 2016, stating the General Assembly's "will is controlling" and interpreted that the 45-day review period began when DEP filed the application.²

3. The North Carolina Constitution from early times has prohibited monopolies and the granting of exclusive privileges to private corporations, except in consideration of public services. N.C. Const. Art. I, §§ 32 and 34. Article I, § 34, states, "[p]erpetuities and monopolies are contrary to the genius of a free state

¹ Duke Energy is currently the largest emitter of greenhouse gases in the United States. www.peri.umass.edu/greenhouse100

² A third alternative is for DEP to waive the 45 days in order to allow a full and open review on its application.

and shall not be allowed. The North Carolina Supreme Court explained the purpose of these provisions as follows:

Third, the purpose of the constitutional provision was not to prevent “the community” from exercising legislatively authorized powers to operate public enterprises but to prevent “the community” from surrendering its power to another “person or set of persons” by grant of exclusive or separate emoluments or privileges unless they are granted “in consideration of public services.” It is not retention of powers but alienation of powers that is prohibited.

Madison Cablevision, Inc. v. City of Morganton, 325 N.C. 634, 655, 386 S.E.2d 200, 212 (N.C. 1989).

4. The N.C. Constitution’s prohibition of exclusive emoluments provides an exception to those grants of monopoly power only when the grant is in clearly within the public interest. Article I, § 32 provides: “No person or set of persons is entitled to exclusive or separate emoluments or privileges from the community but in consideration of public services.” As the North Carolina Supreme Court has stated, an exemption that benefits a particular group of persons is not an exclusive emolument or privilege if: “(1) the exemption is intended to promote the general welfare rather than the benefit of the individual, and (2) there is a reasonable basis for the legislature to conclude the granting of the exemption serves the public interest.” *Town of Emerald Isle ex rel. Smith v. State*, 360 S.E.2d 756, 764 (N.C. 1987). This two-part test applies to both “exemptions” and “affirmative benefits.” *Blinson v. State*, 651 S.E.2d 268, 278 (N.C. App. 2007).

5. In terms of G.S. 62-23, the Commission is “declared to be an administrative board or agency of the General Assembly.” Under this section the Commission is tasked with “ assuming the initiative in performing its duties and responsibilities in securing to the people of the State an efficient and economic

system of public utilities.” This legislation requires the Commission’s active engagement to protect the people of the State where such monopoly privilege has been granted.

6. In exchange for providing DEP with an exclusive utility franchise, the Commission has the authority to “compel [its] operation in accordance with policy of the state as declared in statute.” *State ex rel. Utils. Comm’n v. Public Staff - NC Utils. Comm’n*, 123 NC App. 623, 473 S.E.2d 661 (1996). The first declaration of policy in the Public Utilities Act, and the basis on which all other policies rely, is found in G.S. 62-2(a): “It is hereby declared to be the policy of the State of North Carolina: (1) To provide fair regulation of public utilities in the interest of the public.”

7. Typically, the Utilities Commission possesses the “authority to supervise and control” public utilities, including the ability to make rules and regulations, set rates, order the construction of improvements, and investigate financial records. G.S. 62-30 – 54. However, the Commission’s interpretation of the requirements of the Mountain Energy Act, S.L. 2015-110, has violated this basic principle. In several rulings, the Commission has thwarted efforts to gather the required information or present evidence to determine whether any public interest is advanced by the construction proposal at issue here. Given that demand and cost data has been withheld by DEP; that excess capacity exists in DEP’s service territory and throughout the Southeast; that energy efficiency and demand side management (“DSM”) have not been considered sufficiently as alternatives; that another producer has intervened with a proposal to meet the demand at avoided cost; and that there is growing public opposition to the project; it cannot be shown

that the proposed Asheville project serves the public interest. There can be no protection of the public interest when there is no public scrutiny.

8. Specifically as it relates to the present matter, the questions the Commission should answer are whether the expedited review period in the Mountain Energy Act allows for “fair regulation” of DEP and whether it is “in the interest of the public.” If the answer to either of these questions is negative, the Commission’s interpretation of the Mountain Energy Act allows an unconstitutional monopoly to operate.

9. Further, the policy of the State is “to encourage and promote harmony between public utilities, their users and the environment.” G.S. 62-2(a)(5). In a highly contested project such as the one *sub judice*, the state policy of finding the congruence between DEP’s interests with those of the ratepayers, with a firm regard for environmental protection, has enormous and immediate consequences, especially in the context of whether the Commission is able to make meaningful findings of fact and conclusions of law. An erroneous decision, based on inadequate review, could lock DEP’s future into a burdensome, risky, and costly reliance on natural gas-fueled generation by building new plants which are not needed. The least cost objective is thwarted by this inadequate review process.

10. Because of the expedited review of the application and lack of evidentiary hearing, NC WARN and The Climate Times are presenting in part this statement of position and comments in the nature of an offer of proof, showing the scope and quality of the testimony and evidence that would have been introduced as part of an evidentiary hearing. Further relevant evidence would have come

from cross-examination of DEP and Public Staff witnesses at an evidentiary hearing.

11. As part of this statement of position and comments, NC WARN and The Climate Times have attached affidavits from Dr. Robert W. Howarth, an international expert on the role of methane emissions as a driver of global warming; J. David Hughes, expert on natural gas supplies and price volatility; and William E. Powers, professional engineer and expert on power plants, transmission, and alternatives to natural gas-fired generation. EXHIBITS A, B and C. This expert testimony is supported by a whitepaper, DUKE ENERGY'S MOVE TOWARD A FRACKING GAS FUTURE WOULD BE DISASTROUS FOR CLIMATE CHANGE AND FOR THE NORTH CAROLINA ECONOMY, December 10, 2015, prepared by Dr. Harvard Ayers of The Climate Times and Nancy LaPlaca of NC WARN. EXHIBIT D. The whitepaper further documents the potentially devastating problems posed by natural gas-fired generation, including methane's impact on climate change, and the potential for price spikes and natural gas fuel shortages.. The testimony of Mr. Powers is further supported by NC WARN's report, A RESPONSIBLE ENERGY FUTURE FOR NORTH CAROLINA, updated November 2015, (the "NC WARN report") critiquing DEP's 2015 integrated resource plan ("IRP"). EXHIBIT E.

QUESTIONABLE NEED FOR ADDITIONAL NATURAL GAS UNITS

12. The focus of review on the proposed Asheville project should be determining the best strategy to allow prompt closure of the Asheville coal plants without construction of new generating plants. The Asheville project's blanket

reliance on new natural gas generation capacity is imprudent and wasteful. The \$1.1 billion costs for the project as presented does not include enough data for the members of NC WARN and The Climate Times, and the public, to have a meaningful debate as to whether a different project mix, such as just one combined cycle plant, or elimination of the diesel generators, or wholesale contracts, or robust renewable energy, DSM, and energy efficiency programs, could meet the area's needs at a reasonable cost.

13. More important, DEP has not demonstrated the need for the three natural gas-fired facilities. On December 16, 2015, DEP filed notice of its intent to file its application for the certificate for a 752 MW natural gas-fueled generation facility near Asheville, consisting of two 280 MW combined cycle units and a 192 MW combustion turbine unit. At the same time, DEP would close its two existing coal plants. On January 15, 2016, DEP filed its application for the certificate, limiting it to the three natural gas-fired units. The application did not include a request for approval of the promised solar facility at the site or for any commitment to energy efficiency or DSM as part of the project, although a small battery project was noted as a potential future possibility. The application did not reference the fate of the diesel-fueled peaking units at the site. As it stands before the Commission, the DEP project would result in 1,116 MW of capacity at the Asheville site – six times the power generated there in 2014 (182 MW).³ On its face, this is far more than is required in Asheville.

³ Based on DEP's December 2014 Monthly Fuel Report filed in Docket E-2 Sub 1037, the 379 MW of coal capacity DEP proposes to close operated at an average capacity factor of 46% in 2014. The two existing 185 MW gas/diesel turbines, which will remain in service, operated at an average capacity factor of 2.3% in 2014.

14. In his affidavit, Mr. Powers questions whether it is in the public interest to build up to 752 MW of new natural gas plants, particularly since DEP does not thoroughly examine how much these plants would raise rates over their 30-year expected lifetime, including natural gas pipeline upgrades, compressor stations, and transmission upgrades. EXHIBIT C. Mr. Powers recommends that DEP consider potentially lower-cost, lower-risk distributed generation and energy efficiency as alternatives to new plant construction. Lastly, he addresses load shedding and various grid reliability scenarios to meet grid reliability needs.

15. Also relevant to the issue of need for the facility are the comments submitted by NC WARN with its Motion to Seek Leave to File Comments, filed November 2, 2015, in Docket E-100, Sub 141, on DEP's 2015 IRP. EXHIBIT E. Those comments challenged DEP's forecasts in the growth of demand as well as its overreliance on coal and natural gas over the next 15 year period. Even though the Commission denied NC WARN's motion to consider the report in this year's review of the IRPs, the issues raised by NC WARN are directly relevant to the matter *sub judice* as DEP is relying on its 2015 IRP, as yet unapproved, to justify the proposed Asheville project. In its 2015 IRP, DEP continues to project growth of electricity sales far above the rates supported by actual growth in the past decade, and contrary to the analyses of industry experts such as the Energy Information Administration ("EIA") and American Council for an Energy Efficient Economy ("ACEEE"). DEP's repeated use of exaggerated growth rates calls into question its ability or willingness to accurately assess projected demand across its territory and regionally in Western North Carolina. This flaw is directly relevant to its case for constructing additional natural gas generating capacity.

16. In the application for the Asheville project, DEP inexcusably fails to adequately substantiate its claim that regional winter peak will grow by 17% in the next decade. When asked to provide data and analyses substantiating its claims of high peak growth expectations in Western North Carolina, DEP simply produced a spreadsheet of annual demand growth projections for the years 2016 through 2026. The projections were notably high, with annual growth rates in peak demand reaching as high as 2.4%. When pressed further to provide the analyses and studies that supported the projected growth rates, DEP cited a proprietary model produced by the company ITRON. NC WARN and The Climate Times assert that a model that lacks transparency, is neither dated nor verified, and was commissioned and paid for by DEP as opposed to an independent party is not an acceptable source to rely on in making a determination of need for the project.

17. In his affidavit, paragraph 13, Mr. Powers concludes “the DEP load growth forecast is unsupported and conflicts with the static or declining actual load trend in the Western Carolinas over the last eight years.” EXHIBIT C. Mr. Powers, continues and states “[u]se of a realistic load forecast eliminates the stated need for the [project].”

18. Much of the analysis in NC WARN’s report highlights specific problems with DEP’s reliance on natural gas. EXHIBIT E. The additional 11,000 MW of capacity Duke Energy (both DEP and Duke Energy Carolinas) predicts it will need is almost entirely added through new natural gas plants, with the addition of the two proposed nuclear plants at the Lee Nuclear Station in South Carolina. The no-carbon sensitivity model eliminates the nuclear plants and replaces them MW for MW with natural gas-fired combustion turbines. The cost to ratepayers for the “all

natural gas” plan would be at least \$15 billion over the 15-year planning horizon. The proposed Asheville project is just the first of many.

19. Similar to the conclusion reached in NC WARN’s report on the IRPs and in line with Mr. Power’s opinion, NC WARN and The Climate times are convinced the new natural gas-fired plants are not needed in the Asheville area, in large part due to a glut of generation available in DEP’s service territory and across the Southeast, readily available hydropower and merchant combined cycle facilities, and under-utilized renewable energy, combined heat and power (“CHP”), DSM, and energy efficiency. The application actually states the new plant would serve both Carolinas, not just the Asheville area. The proposed project is not about “replacing coal,” it is about the construction of new baseload power plants.

20. Based on the conclusions of Mr. Powers in his affidavit, paragraph 14, and the NC WARN report among other sources, NC WARN and The Climate Times maintain there is a better path forward. The Commission should instead seek to replace coal plants with a mixed strategy based on energy choice, energy efficiency, DSM, distributed renewable energy, and CHP and other forms of on-site generation. In its application, DEP has not applied for the ability to add solar at the present site, it has only baldly claimed it will add some solar at some point in the future. Similarly, DEP has maintained it is committed to energy efficiency and DSM options for the Asheville area, but has made no tangible proposals.

21. The two 230 kV transmission lines serving the Asheville area (Enka and Pisgah Forest) can each carry up to 400 MW of power, making large long-term wholesale contracts readily obtainable, either from merchant plants or other utilities in the Southeast. DEP has not maintained there is an deliverability issues

with these lines. Moreover, these lines are routinely used to supply power to the Asheville area; specifically these lines were used to provide power to the Asheville area on the 2014 winter peak, an abnormally high demand of 1183 MW. In the days before the January 2014 polar vortex, Asheville Unit 1 was down, but there was still adequate power available.⁴ Without the need for new transmission lines, the present line should be assessed for upgrades.

22. Specifically for the Asheville project, there are other alternative sources of electricity readily available, but not addressed in the application.

a. As noted in the NC WARN, the utilities in the Southeast have considerable excess capacity, much of which is available for purchase. The EIA reports that in the Winter 2014 -2015, SERC East (Carolinas) had an overcapacity of 36% in the base case, and 15% for the high demand/reduced supply case.⁵ For the summer of 2015, all of the utilities in the Southeast reported overcapacity of 23 – 36%, far more than is needed.⁶ DEP disregards the excess capacity available in the Southeast, and fails to make strategic power purchases to supplement its own generation. Again, the two existing transmission lines have no deliverability issues.

b. Columbia Energy, LLC, an intervenor in this docket, maintains that it could supply 523 MW from its existing natural gas plant in South Carolina at an avoided cost rate. It has a firm natural gas contract and does not need new

⁴ According to data provided by DEP, Asheville Unit 1 experienced an outage from 7:14 PM on January 2, 2014 to 12:18 PM on January 5, and again was offline from 4:57 PM on January 6, 2014 to 6:27 PM the same day. During these outages, temperatures were as low as 9 degrees in the Asheville area, yet power was maintained.

⁵ www.eia.gov/todayinenergy/detail.cfm?id=19631

⁶ www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2015_Summer_Reliability_Assessment.pdf

pipelines or the construction of new natural gas-fired plants. DEP (or Duke Energy Carolinas) is required to purchase this power under Federal law.⁷ DEP should consider purchasing power from the existing facility to save ratepayers the cost of constructing new plants and pipelines, but has not moved forward to initiate a contract with Columbia Energy.

c. Brookfield Renewable Energy Partners, an international energy firm, owns and operates several hydroelectric plants in western North Carolina and eastern Tennessee, and is able to provide approximately 150 MW of dispatchable power. Our understanding is DEP refused to purchase the output from those facilities and instead that output is being wheeled across DEP transmission lines to the PJM system for sale instead.

d. DEP does not discuss the alternative of “reconductoring” transmission lines using aluminum core steel reinforcement (“ACSR”), which can double the existing line capacity to the Western region. ACSR lines are low-weight and high-strength and thus highly desirable for transmission upgrades. The cost of ACSR is far less than the cost to build a new power plant, and would allow additional power to be imported into DEP-West. DEP does not seem to have investigated the option of increasing the capacity of existing lines for a modest investment. Improving the existing transmission line would likely be more acceptable to the public in the region, as well as provide needed reliability.

NATURAL GAS IS A DISASTROUS LONG TERM STRATEGY

⁷ The Columbia facility is a Qualifying Facility (“QF”), as that term is defined in Section 210 of the Public Utility Regulatory Policies Act of 1978 (“PURPA”), 18 U.S.C.A 824a-3.

23. Natural gas is an extremely risky fuel for the future. Given that natural gas prices, now low because of oversupply and low demand, are expected to be extremely volatile over the next decade, DEP's dependence on natural gas is short-sighted. The natural gas plants could cause rate spikes for all DEP customers due to the extreme price and supply volatility of gas. Like many utilities, DEP is seeking to add gas capacity while natural gas prices are low, but the conditions leading to low prices do not promise that prices will stay low as production declines.

24. In his affidavit, Mr. Hughes describes his analysis of shale plays and presents his conclusion that total U.S. natural gas production will decline because current drilling rates cannot be maintained due to poor economics. EXHIBIT B. As a result, "fuel prices could skyrocket, putting ratepayers at risk of shortages and price spikes." As a result, Mr. Hughes concludes:

In my expert opinion, the cost of natural gas in the medium and long term will be much higher than today, and higher than the projections of the EIA, which will negatively impact the investments Duke Energy is making in natural gas power plants that are expected to run for 30 or more years, and will result in considerably higher cost for ratepayers than expected.

Affidavit, paragraph 15.

25. Natural gas-fired generation has excessive and unreasonable environmental and social costs, especially in terms of climate change. The use of natural gas for electricity is already speeding global warming due to methane's global warming potential (up to 100 times that of carbon dioxide over the next decade) from large methane leakage throughout the natural gas industry. In his affidavit, Dr. Howarth described several studies he and others have conducted

showing “even small emissions of methane make the global warming consequences of using natural gas worse than coal.” EXHIBIT A. He concludes “that natural gas – particularly as it comes increasingly from shale gas – is not a bridge fuel” and “that building new plants to produce electricity from natural gas is a disastrous strategy.”

CONCLUSION

26. NC WARN and The Climate Times urge the Commission to DENY the application for the certificate for DEP’s proposed construction of natural gas generation. There are simply too many defects in the application, and too little is known about the project, to allow the Commission to make its mandated findings and conclusions. There are a number of reasonable and valid alternatives to the project. DEP must proceed with closure of the existing coal units but DEP’s apparent commitment to a natural gas future is costly and risky, and would have a disastrous impact on climate change at the worst possible time.

Respectfully submitted, this the 12th day of February 2016.

/s/ John D. Runkle

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing POSITION AND COMMENTS BY NC WARN AND THE CLIMATE TIMES (E-2, Sub 1089) upon each of the parties of record in this proceeding or their attorneys of record by deposit in the U.S. Mail, postage prepaid, or by email transmission.

This is the 12th day of February 2016.

/s/ John D. Runkle

EXHIBIT A

AFFIDAVIT OF ROBERT W. HOWARTH

For NC WARN and The Climate Times

Docket E-2 Sub 1089

February 9, 2016

1. My name is Robert W. Howarth, and I am an Earth system scientist and ecologist who has been a tenured faculty member at Cornell University in Ithaca, New York for the past 30 years. I earned a Ph.D. jointly from MIT and the Woods Hole Oceanographic Institution in 1979. I have studied global change since the 1970s and have published over 200 research papers and have edited or written 7 books. I have served on 12 committees and panels of the US National Academy of Sciences, the U.S. Environmental Protection Agency, and the International Council of Science, including several that addressed global change. I have chaired 4 of these committees and panels. I am an expert on the role of methane emissions as a driver of global warming.

2. I am submitting this affidavit as a witness for interveners NC WARN and The Climate Times.

3. When burned, natural gas emits 60% of the CO₂ that coal emits to produce the same amount of energy. Thus, natural gas has been seen by some, including utilities, as a so-called “bridge fuel” from other fossil fuels to the future when renewable energy dominates our country’s electrical energy generation.

4. This concept of natural gas as a bridge fuel was based solely on CO₂ emissions, and ignored emissions of methane, a very potent greenhouse gas that also is contributing significantly to global warming. The latest synthesis report from the Intergovernmental Panel on Climate Change (IPCC, 5th Synthesis) from 2013¹ concluded that current emissions of methane equal the current emissions of CO₂ as a driver of global warming.

5. In 2011, I was the lead author on the very first analysis of the role of methane in the greenhouse gas footprint of natural gas produced from shale formations (“shale gas”), published in the peer-reviewed journal *Climatic Change*²

¹ Intergovernmental Panel on Climate Change (IPCC) 5th Assessment:
<https://www.ipcc.ch/report/ar5/>

² Methane and the greenhouse-gas footprint of natural gas from shale formations, Robert W. Howarth, Renee Santoro, Anthony Ingraffea, March 13, 2011, *Climatic Change*, DOI 10.1007/s10584-011-0061-5:
<http://www.acsf.cornell.edu/Assets/ACSF/docs/attachments/Howarth-EtAl-2011.pdf>

with a follow-up in the prestigious journal *Nature*.³ We concluded that even small emissions of methane could make the global warming consequences of using natural gas worse than coal. Natural gas is composed overwhelmingly of methane, and some leakage is inevitable.

6. Our 2011 analysis⁴ indicated that methane emissions from using natural gas were high enough to make the use of natural gas a poor choice as a “bridge fuel.” Rather than mitigating global warming, the use of natural gas might actually aggravate global warming. Our analysis also suggested that shale gas was likely to be worse than conventional natural gas. We called for more study, though, since the publicly available data to support our conclusion were limited.

7. Our study received global attention, and was reported in 1,200 newspapers including the *New York Times*.⁵ The scientific community took on our challenge for more study, and many new research projects were launched to better measure methane emissions from both conventional natural gas and shale gas development.

8. Several new studies published in 2013 and 2014, such as those led by Miller et al. from Harvard⁶ and Brandt et al. from Stanford,⁷ supported our analysis that methane emissions from conventional natural gas are large enough as to make this fuel highly undesirable from the standpoint of global warming.

9. A 2012 study by Shindell (then at NASA and now at Duke University) in the journal *Science*⁸ concluded that methane emissions were even more important to control than our 2011 papers had concluded. This new study, now endorsed by the United Nations, showed that the temperature of the Earth would warm to dangerous levels of 1.5° C within 15 years and 2° C within 35 years unless global

³ *Natural gas: should fracking stop?* Robert W. Howarth, Anthony Ingraffea and Terry Engelder, September 15, 2011, *Nature* 477, 271–275, doi:10.1038/477271a: http://www.nature.com/nature/journal/v477/n7364/full/477271a.html?WT.ec_id=NATURE-20110915

⁴ See footnote 2.

⁵ *Methane Losses Stir Debate on Natural Gas*, Tom Zeller Jr., *New York Times*, April 12, 2011: <http://green.blogs.nytimes.com/2011/04/12/fugitive-methane-stirs-debate-on-natural-gas/>. *Studies Say Natural Gas Has Its Own Environmental Problems*, Tom Zeller, *New York Times*, April 11, 2012: <http://www.nytimes.com/2011/04/12/business/energy-environment/12gas.html>

⁶ *U.S. methane emissions exceed government estimates* Collaborative study indicates fossil fuel extraction, animal husbandry major contributors, Caroline Perry, SEAS Communications, November 25, 2013: <http://news.harvard.edu/gazette/story/2013/11/u-s-methane-emissions-far-exceed-government-estimates/>

⁷ *America's natural gas system is leaky and in need of a fix, new study finds*, Stanford Report, February 13, 2014, <http://news.stanford.edu/news/2014/february/methane-leaky-gas-021314.html>

⁸ *Simultaneously Mitigating Near-Term Climate Change and Improving Human Health and Food Security*, Drew Shindell et al, *Science*, January 13, 2012: <http://science.sciencemag.org/content/335/6065/183.abstract?sid=397ac687-9144-4bec-9e96-6a3de6e25dd3>

emissions of methane were curtailed. Simply reducing CO₂ emissions would have no effect on this time scale.

10. In 2014, Schneising and colleagues published a peer-reviewed paper based on satellite imagery across the surface of the Earth between 2002 and 2012.⁹ They concluded that methane emissions had risen globally over this time period, aggravating global warming. They further concluded that shale gas and oil development in the United States since 2008 had greatly increased global fluxes of methane to the atmosphere and may well be the major driver of the increased concentrations observed by satellite.

11. By early 2015, many studies by academic scientists and US government scientists in the National Oceanic and Atmospheric Administration published in peer-reviewed publications had concluded that methane emissions from the natural gas industry were high.¹⁰

12. In 2015, the engineer who holds the patent on the instrument approved by the US Environmental Protection Agency to measure methane emissions (Touche Howard) published two peer-reviewed papers concluding that his instrument had been systematically mis-used in a way that had led to under-estimation of methane emissions from the natural gas industry in some highly publicized studies, and quite likely by many studies previously relied upon by the US EPA.¹¹

13. The current status of our understanding of how methane emissions affect the greenhouse gas footprint of natural gas is summarized in a peer-reviewed article I published in October 2015 in the journal *Energy & Emissions Control Technologies*,¹² based on over a dozen new peer-reviewed studies published since 2012. Considering the complete lifecycle assessment from production at the well through to delivery and use by the final consumer, conventional natural gas emits approximately 3.8% of the natural gas produced to the atmosphere as methane, and shale gas emits substantially more, probably 10% plus or minus 5%.

14. To compare methane emissions and CO₂ emissions requires a specified time frame. Historically, most analyses used a 100-year time frame, but the

⁹ Schneising, O., Burrows, J. P., Dickerson, R. R., Buchwitz, M., Reuter, M. and Bovensmann, H. (2014), *Remote sensing of fugitive methane emissions from oil and gas production in North American tight geologic formations*. *Earth's Future*, 2: 548–558. doi:10.1002/2014EF000265: <http://onlinelibrary.wiley.com/doi/10.1002/2014EF000265/abstract>

¹⁰ National Oceanic & Atmospheric Administration, *Trends in Atmospheric Methane*, accessed 2/9/2016: http://www.esrl.noaa.gov/gmd/ccgg/trends_ch4/

¹¹ *Methane Leaks May Greatly Exceed Estimates, Report Says*, John Schwartz, August 4, 2015: <http://www.nytimes.com/2015/08/05/science/methane-leaks-may-greatly-exceed-estimates-report-says.html>

¹² *Methane emissions and climatic warming risk from hydraulic fracturing and shale gas development: implications for policy*, R.W. Howarth, July 1, 2015: <https://www.dovepress.com/methane-emissions-and-climatic-warming-risk-from-hydraulic-fracturing-peer-reviewed-article-EECT>

Intergovernmental Panel on Climate Change in their 2013 5th assessment report called this arbitrary, and stated that the comparison should be based on time frames more appropriate for the concern being considered. Since the Earth will warm to 1.5 degrees above the pre-industrial baseline within the next 15 years and to 2 degrees within 35 years unless methane emissions are reduced, a 20-year time frame for comparing methane and CO₂ emissions is far more appropriate than a 100-year time frame.

15. At a 20-year time frame for comparison, the Intergovernmental Panel on Climate Change concluded that methane is 86 times more potent than CO₂ as a greenhouse gas.

16. Using the best available data for estimates on methane emissions and the 20-year time frame for comparing methane and CO₂ as greenhouse gases, my recent peer-reviewed paper concluded that both conventional natural gas and shale gas have larger greenhouse gas footprints than coal, even though the CO₂ emissions from burning coal are greater. The total greenhouse gas footprint for conventional natural gas is approximately 1.2 times greater than that for coal. For shale gas, the greenhouse gas footprint is approximately 2.7 times greater than that for coal.

17. Shale gas production now contributes approximately 40% of the total production of natural gas in the United States. Therefore, the average natural gas used in the country (40% from shale gas and 60% from conventional sources) has a greenhouse gas footprint that is 1.8 times greater than that for coal. The U.S. Department of Energy predicts that the percentage of gas production coming from shale gas will increase in coming years, which will increase the greenhouse gas footprint for average natural gas compared to coal.¹³

18. When natural gas is used to generate electricity, the efficiency with which the electricity is generated from the heat released as a fuel is burned must also be considered. Most coal burning plants have efficiencies of 30% to 37%, although higher efficiencies are possible, according to several published studies. Natural gas plants have efficiencies that range from 28% to 58%.¹⁴

19. Using the information from point #17 and the average efficiencies of 33.5% for coal plants and 43% for natural gas plants, the greenhouse gas footprint for producing electricity per MWh from natural gas (including 40-50% of it coming from shale gas) is 1.4-fold greater than that produced from coal. That is, for every 100 g CO₂ equivalents of emission from using coal, the natural gas plant would produce 140 g CO₂ equivalents.

¹³ See *The Growth of U.S. Natural Gas: An Uncertain Outlook for U.S. and World Supply*, For 2015 EIA Energy Conference, June 15, 2015, Washington, D.C., by John Staub, Team Lead, Exploration and Production Analysis

<http://www.eia.gov/conference/2015/pdf/presentations/staub.pdf>

¹⁴ See EIA webpage on power plant efficiency: <https://www.eia.gov/tools/faqs/faq.cfm?id=107&t=3>

20. Based on the above numbers, the Duke Energy proposal to generate 560 MW of electricity from natural gas will produce twice as much in greenhouse gas emissions as the Asheville 376MW coal plant that is proposed to be replaced. That is, each of the planned two, 280 MW natural gas plants individually will produce greenhouse gases equal to the single, old 376 MW coal plant.

21. One clear conclusion is that natural gas – particularly as it comes increasingly from shale gas – is not a bridge fuel. When emissions of methane and CO₂ are compared over appropriate time scales, natural gas is an even worse fuel choice than is coal from the standpoint of global warming.

22. It is also critical to re-state and emphasize the point made in #9 above. It is far more important to reduce methane emissions than carbon dioxide emissions over the coming decade or two, if we are to avert extremely dangerous levels of global warming within the next 15 to 35 years. This means that building new plants to produce electricity from natural gas is a disastrous strategy.

23. Several recent studies, including two peer-reviewed papers co-authored by me, show that it is entirely feasible to replace electricity generation from fossil fuels with renewable electricity on the time scale of the next 20 years. It is essential that society do so if we are to reduce the chances of catastrophic damage from global warming.

AFFIDAVIT

Town of Ulysses, Tompkins County, State of New York

I, Robert Howarth, appearing before the undersigned notary affirm the contents of the following statement are true to the best of my knowledge, based on my professional judgement and experience with such matters.



Signature

Sworn to (or affirmed) and subscribed before me this the 10th day of February, 2016.

CARISSA M. PARLATO
Notary Public, State of New York
No. 01PA6303992
Qualified in Tompkins County, 18
Commission Expires May 19, 20



Official Signature of Notary

Carissa Parlato

_____, Notary Public
Notary's printed or typed name

My commission expires: 5/19/18

**AFFIDAVIT OF J. DAVID HUGHES
FOR NC WARN and The Climate Times**

Docket E-2 Sub 1089

February 9, 2016

1. My name is J. David Hughes, and I am a geoscientist who has studied energy resources for four decades, including 32 years with the Geological Survey of Canada as a scientist and research manager. I coordinated a publication assessing Canada's unconventional natural gas potential as Team Leader for the Canadian Gas Potential Committee. I have also studied U.S. shale gas extensively and published comprehensive reports on future shale gas production potential. My work has been widely cited in the press, including *The Economist*, *Forbes*,¹ *Bloomberg*,² *The Los Angeles Times*,³ *The New York Times*⁴ and *The Atlantic*,⁵ and has been featured in *Canadian Business*,⁶ *Walrus*⁷ and elsewhere.
2. I am submitting this affidavit as a witness for interveners NC WARN and The Climate Times.

¹ *Does Anyone Really Know How Long the Shale Boom Will Last?* Tom Zeller, Jr., January 5, 2015: <http://www.forbes.com/sites/tomzeller/2015/01/05/does-anyone-really-know-how-long-the-shale-gas-boom-will-last/>

² *Is the Shale Boom Going Bust?* Bloomberg View, Tom Zeller, April 22, 2014: <http://www.bloombergvew.com/articles/2014-04-22/is-the-u-s-shale-boom-going-bust> .

³ *'Fracking' the Monterey Shale: boon or boondoggle?* Alex Prud'homme, December 29, 2013: <http://www.latimes.com/opinion/op-ed/la-oe-prudhomme-fracking-california-20131222-story.html>, and *U.S. Officials cut estimate of recoverable Monterey Shale Oil by 96%*, Louis Sahagun, May 20, 2014: <http://www.latimes.com/business/la-fi-oil-20140521-story.html>

⁴ *Studies Say Natural Gas Has Its Own Environmental Problems*, Tom Zeller, Jr., April 11, 2011: <http://www.nytimes.com/2011/04/12/business/energy-environment/12gas.html>

⁵ *Yes, Unconventional Fuels Are That Big a Deal*, by Charles C. Mann, May 7, 2013: <http://www.theatlantic.com/technology/archive/2013/05/yes-unconventional-fossil-fuels-are-that-big-of-a-deal/275616/>

⁶ *B.C. LNG industry will increase fracking-caused earthquakes: expert*, Laura Cane, August 30, 2015: <http://www.canadianbusiness.com/business-news/b-c-lng-industry-will-increase-fracking-caused-earthquakes-expert/>

⁷ *An Inconvenient Talk: David Hughes Guide to the End of the Fossil Fuel Age*, Chris Turner, June 2009: <http://thewalrus.ca/an-inconvenient-talk/>

3. Future shale gas production estimates must be carefully reviewed, as 50% of U.S. natural gas production is now shale gas.⁸ “Shale” gas is produced by hydraulic fracturing (“fracking”), in conjunction with horizontal drilling, a technique that cracks the source rock to release hydrocarbons.
4. My analysis of shale plays accounting for 88% of shale gas and 82% of shale oil shows that estimates of future production of natural gas from shale plays are likely overstated, given the high decline rates observed and the concentration of high quality wells in relatively small sweet spots within plays, putting ratepayers at risk of natural gas shortages and price spikes. The average shale gas well declines 75-85% over three years, and some 30-45% of a play’s production must be replaced each year by more drilling. Drilling outside of sweet spots, as they are exhausted, will require more wells to maintain a given level of production and require higher prices.
5. Seventy-eight percent of U.S. shale gas comes from only six plays, with several currently in decline. The Haynesville in Louisiana and East Texas was the biggest shale play in 2012, and is now down 50% from its January 2012 peak.⁹ The largest U.S. shale play, the Marcellus, peaked in June 2015, and is now down 3.4% from peak. Since Duke Energy’s gas supply is expected to be supplied by the Gulf coast and Appalachian regions, production declines should send up a red flag.
6. Per my analysis on shale gas well productivity, *Drilling Deeper* (2014) and *Shale Gas Reality Check* (2015), I believe the U.S. Department of Energy’s Energy Information Administration’s (EIA) projections for shale gas production from major plays through 2040 were far too optimistic by at least 50%.
7. My estimates show that the EIA’s 2015 projection of U.S. shale gas production is even more optimistic than the 2014 report by 9%.¹⁰

⁸ *It’s Frack, Baby, Frack as Conventional Gas Drilling Declines*, Mason Inman, June 23, 2014 <http://www.scientificamerican.com/article/it-s-frack-baby-frack-as-conventional-gas-drilling-declines-infographic/>

⁹ *EIA Natural Gas Weekly from February 3, 2016*, <http://www.eia.gov/naturalgas/weekly/>

¹⁰ From *Shale Gas Reality Check*, 2015: http://www.postcarbon.org/wp-content/uploads/2015/07/Hughes_Shale-Gas-Reality-Check_Summer-2015.pdf

“The EIA’s Annual Energy Outlook 2015 is even more optimistic than the AEO2014, which we showed in *Drilling Deeper* suffered from a great deal of questionable optimism. The AEO2015 reference case projection of total shale gas production from 2014 through 2040 is 9%, or 36 tcf, greater than AEO2014. Cumulative production from the major plays in AEO2015, which account for 80% of this production, is 50% higher than my “Most Likely” case in *Drilling Deeper*, and the projected production rate in 2040 is 170% greater. In AEO2015, the EIA is counting much more on unnamed plays or ones—like the Utica Shale—that aren’t as yet producing very much shale gas.”

8. Many companies are losing money on shale plays, and with interest rates increasing, the dollar value of shale assets being 'written down' is increasing.¹¹ There is evidence that shale gas plays are cash flow negative for many companies, and maintaining the drilling treadmill necessary to offset steep declines requires ever-more investment capital.¹²
9. My analysis¹³ was recently proven correct in California's Monterey shale, where reserves were recently decreased by a stunning 96%. In 2011, the EIA estimated that the Monterey Shale in California contained two-thirds of the shale oil resources in the U.S. After reviewing the data, I concluded that the EIA's estimate was vastly overstated. In early 2014, the EIA quietly downgraded its estimate from 13.7 billion to 600 million barrels.¹⁴ In October 2015 the U.S. Geological Survey (U.S.G.S.) released a report further downgrading resources, so that EIA's initial estimates were reduced by a startling 99%, thus agreeing with myself and others.
10. I am not the only expert disputing the EIA's numbers. Mr. Art Berman has also sounded the alarm about overly optimistic production rates and reserves for many years.¹⁵
11. In order to maintain the current level of shale gas production, the U.S. will need to drill many thousands of wells each year, and this number will escalate as the sweet spots become saturated with wells and drilling moves into lower productivity parts of plays. This will require higher prices.¹⁶ Drilling rates have already fallen below what is

¹¹ *BHP Billiton writes down \$7.2bn of shale assets*, January 15, 2016, BBC News:

<http://www.bbc.com/news/business-35320918>

¹² *Gas bubble leaking, about to burst*, Richard Heinberg, October 22, 2012:

<http://www.postcarbon.org/gas-bubble-leaking-about-to-burst/>

¹³ *Drilling California: A Reality Check on the Monterey Shale*, J. David Hughes, December 2, 2013:

<http://www.postcarbon.org/publications/drilling-california/>

¹⁴ *U.S. Officials Cut Estimate of Recoverable Monterey Shale Oil by 96%*, Louis Sahagun, May 20, 2014: <http://www.latimes.com/business/la-fi-oil-20140521-story.html>

¹⁵ *Arthur Berman Interview: Why Today's Shale Era is the Retirement Party for Oil Production*, Chris Martenson, February 12, 2015: <http://www.resilience.org/stories/2015-02-12/arthur-berman-interview-why-today-s-shale-era-is-the-retirement-party-for-oil-production>

Shale, the Last Oil and Gas Train: Interview with Arthur Berman, James Stafford, www.oilprice.com, March 5, 2014: <http://oilprice.com/Interviews/Shale-the-Last-Oil-and-Gas-Train-Interview-with-Arthur-Berman.html>

¹⁶ *Shale Skeptics Take on Pickens as Gas Fuels Policies*, Edward Klump, Bloomberg, July 15, 2013: <http://www.bloomberg.com/news/articles/2013-07-14/shale-skeptics-take-on-pickens-as-gas-fuels-policies> *Energy: A Reality Check on the Shale Revolution*, J. David Hughes, *Nature*, 494, pages 307-308, February 21, 2013:

http://www.nature.com/nature/journal/v494/n7437/full/494307a.html?WT.ec_id=NATURE-20130221

required to maintain production and U.S. shale gas production is declining from its peak in July 2015.¹⁷

12. If natural gas production declines, as is currently the case, and drilling rates cannot be maintained due to poor economics, fuel prices could skyrocket, putting ratepayers at risk of shortages and price spikes.¹⁸ Shale gas (and oil) industries are unsustainable in the longer term unless prices rise considerably, as the best parts of shale plays are exhausted and drilling moves into lower quality geology, requiring ever increasing drilling rates and capital inputs.
13. Long term price expectations are extremely important in estimating the overall lifetime cost of the proposed gas plants. Price versus production forecasts of the EIA are unrealistic in the long term, given the nature of shale gas plays and the fact that the best portions are being drilled now.
14. DEP refused to respond to NC WARN Data Request 1-8, which asked what DEP's price projections for natural gas (low, medium and high) would be over the plant's 30 year life. This information should be readily available, as it will significantly affect the plant's overall economics.
15. In my expert opinion, the cost of natural gas in the medium and long term will be much higher than today, and higher than the projections of the EIA, which will negatively impact the investments Duke Energy is making in natural gas power plants that are expected to run for 30 or more years, and will result in considerably higher costs for ratepayers than expected.

¹⁷ *EIA Natural Gas Weekly*, February 3, 2016, <http://www.eia.gov/naturalgas/weekly/>

¹⁸ During 2014, the Northeastern U.S. experienced price spikes for natural gas as the "polar vortex" – a long-lasting blast of Arctic air – drove heating demand off the charts, see *5 charts that explain U.S. electricity prices*, Gavin Bade, March 23, 2015: <http://www.utilitydive.com/news/5-charts-that-explain-us-electricity-prices/378054/>

AFFIDAVIT

Town of Ulysses, Tompkins County, State of New York

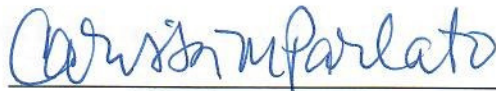
I, Robert Howarth, appearing before the undersigned notary affirm the contents of the following statement are true to the best of my knowledge, based on my professional judgement and experience with such matters.



Signature

Sworn to (or affirmed) and subscribed before me this the 10th day of February, 2016.

CARISSA M. PARLATO
Notary Public, State of New York
No. 01PA6303992
Qualified in Tompkins County
Commission Expires May 19, 2018



Official Signature of Notary

Carissa Parlato, Notary Public
Notary's printed or typed name

My commission expires: 5/19/18

AFFIDAVIT OF William E. Powers
For NC WARN and The Climate Times

Docket E-2 Sub 1089

February 5, 2016

1. My name is William E. Powers, P.E., and I am principal of Powers Engineering, 4452 Park Blvd., Suite 209, San Diego, CA 92116. I am a consulting energy and environmental engineer with over 30 years of experience in the fields of power plant operations and environmental engineering. I have worked on the permitting of numerous peaking gas turbine, micro-turbine, and engine cogeneration plants, and am involved in siting of distributed solar photo-voltaic (PV) projects. I began my career converting Navy and Marine Corps shore installation projects from oil firing to domestic waste, including wood waste, municipal solid waste, and coal, in response to concerns over the availability of imported oil following the Arab oil embargo in the 1970's.
2. I authored "*San Diego Smart Energy 2020*" (2007) and "*(San Francisco) Bay Area Smart Energy 2020*" (2012),¹ and have written articles on the strategic cost and reliability advantages of local solar over large-scale, remote, transmission-dependent renewable resources. I have a B.S. in mechanical engineering from Duke University, an M.P.H. in environmental sciences from UNC – Chapel Hill, and am a registered professional engineer in California. My complete resume is included as Attachment A.
3. I am submitting this affidavit as a witness for interveners NC WARN and The Climate Times. I reviewed DEP's publicly available application and exhibits as a basis for these comments.
4. As a regulated monopoly utility with a guaranteed rate of return of ~10%, DEP generates revenue primarily from DEP-owned central-station power plants and transmission lines. DEP does not generate revenue from third-party owned distributed generation, energy efficiency, or renewable energy. DEP generates no revenue from wholesale purchased power.
5. The purpose of this affidavit is to demonstrate my conclusions that:

¹ *San Francisco Bay Area Clean Energy Roadmap Would Slash Emissions, Push Zero Net Energy Buildings*, April 5, 2012: <http://www.renewablecommunities.org/2012/04/healthy-energy-independence-roadmap.html>

- a. DEP's application is inadequate, with insufficient critical analysis, and thus does not provide an adequate basis for the North Carolina Utilities Commission (NCUC) to make a prudent decision on whether to authorize approximately 750 MW of new natural gas plants;²
- b. Building up to 750 MW of new natural gas power plants does not appear to be in the public interest;
- c. Lack of load growth makes the project unnecessary and unjustifiable. In addition, distributed generation, demand response, energy efficiency, combined heat and power, purchased power and solar are cost-effective alternatives to displace coal and gas generation in Duke Energy Progress Western (DEP-West) North Carolina over time. DEP has not made a compelling factual case that an additional 560 MW (two units) natural gas combined cycle (NGCC) plant online in 2019, plus 186 MW of combustion turbines [CTs], online in 2023, are needed.
- d. DEP provides no comparative cost information to support its planned phase-out of wholesale market power purchases (2015 IRP, pp. 49-50) in favor of new DEP-owned generation and associated natural gas pipeline and transmission line upgrades/additions.
- e. DEP provides no comparative cost information to support the WCMP as justifiable to avoid costs associated with three fuel oil combustion turbine units that would be required in the absence of the WCMP (2015 IRP, p. 14), or to support why "engagement in a unique opportunity to partner with the local gas distribution company to bring cost-effective natural gas supply to the western Carolinas" makes economic sense relative to alternatives.

a. DEP'S APPLICATION IS INADEQUATE AND THUS DOES NOT PROVIDE SUFFICIENT INFORMATION SO THAT THE NORTH CAROLINA UTILITIES COMMISSION (NCUC) CAN MAKE A PRUDENT, WELL-INFORMED DECISION

- 6. The NCUC Public Staff will not make its findings available until February 22, 2016, this providing only a week for parties, concerned citizens, ratepayers and others to review the Public Staff's findings. This shortened time frame provides no time to review the Public Staff's recommendations and provide data the

² Under N.C. Gen. Stat. 62-110.1, a certificate for construction of a generating facility, or Certificate of Public Convenience and Necessity (CPCN) shall not be permitted without showing that the plant is needed and in the public's interest, i.e. "to achieve maximum efficiencies for the benefit of the people of North Carolina" per N.C. Gen. Stat. 62-110.1(c). Although I am not an attorney, I have participated in many CPCN application proceedings, and am familiar with the difference between an adequate v. inadequate application.

Public Staff may not currently have in reviewing a 30-year, \$1.1 billion investment.

7. DEP's application for the Asheville gas-fired units is based on its most recent Integrated Resource Plan (IRP). No evidentiary hearings were held by the NCUC to vet the accuracy of the information contained in the IRP. Evidentiary hearings would have allowed independent experts and other parties to verify the accuracy of the application. Complete information is essential to making an informed decision regarding whether the proposed investment is prudent and in the public interest.
8. Similarly, DEP's application in this case does not provide enough information on the need for the project. While DEP asserts that it needs the power in order to comply with NERC reliability standards, there is insufficient information provided by DEP to determine whether DEP's assertion is valid.

Lack of information on cost to construct

9. Following are areas of insufficient information provided by DEP that, in my professional opinion, must be remedied:
 - a. There is no break-out of costs of the proposed 560 MW natural gas combined cycle unit, 186 MW combustion turbine, and associated natural gas delivery and electric transmission infrastructure projects, only the total projected cost of \$1.1 billion;
 - b. The power plant is to be constructed on a reclaimed coal ash pit in a constrained area surrounded by mountains no information is provided on how the reclaimed coal ash pit will be stabilized to support power plant infrastructure.
 - c. DEP states the natural gas combined cycle (NGCC) plant output will be limited by transmission constraints, but provides no information on how substantially this will affect output;³
 - d. DEP projects an annual peak load growth of nearly 17% to occur in Western North Carolina over the next 10 years.⁴ Yet the trend is an actual decline in summer peak load between 2007 and 2014, and an up-and-down trend in winter peak load over the same time period.⁵ The 2014 winter peak was likely driven by a single extreme and short duration

³ See DEP's answer to NC WARN Data Request 1-19: "The output is constrained by the site elevation and the transmission capacity. This also drives the \$/kW costs higher," included as Attachment B.

⁴ See DEP's answer to NC WARN Data Request 1-3, included as Attachment B.

⁵ 21-dec-15 DEP response to NC WARN Data Request 1-2. Summer peak: 2007, 849 MW; 2012, 856 MW; 2014, 790 MW. Winter peak: 2007, 935 MW; 2010, 1,060 MW; 2013, 915 MW; 2014, 1,163 MW.

weather event that is not indicative of a relentlessly rising winter peak trend. There is no basis, based on actual WNC summer and winter peak loads over the last eight years, to assume any summer or winter peak load growth over the next ten years. The DEP projection that growth will increase and accelerate over the years – from 0.9% in 2017 to as high as 2.1% in 2021, and 2.4% in 2025, is unsupported by facts and divorced from the reality of static or declining actual peak loads.⁶

- e. DEP has not provided basic information about the power plant's natural gas fuel supply, such as necessary upgrades to existing pipelines and compressor stations (including cost and number), the parasitic load to run the compressor stations, and other questions included in NC WARN's Data Request 1-13.⁷
- f. Finally, DEP's response to NC Warn Data Request 1-30 states that it does not want to provide transmission line maps. Since the issue of available transmission capacity to import power into the WNC region is critical to determining the legitimacy of the stated need for the project, sufficient information about current transmission capacity and redundancy needs to be provided.

Lack of information on need for DEP to own and operate WCMP capacity

- 10. DEP has provided no support for its contention that DEP must own and operate the WCMP CC plant due to its "critical function" in lieu of relying on wholesale market power purchases to meet the resource need.

Lack of information on environmental impacts

- 11. No information is provided by DEP on how much water withdrawals will increase from the French Broad River to provide makeup water to the WCMP CC plant cooling tower.

b. BUILDING UP TO 750 TOTAL MW OF NEW NATURAL GAS POWER PLANTS DOES NOT APPEAR TO BE IN THE PUBLIC INTEREST

⁶ See DEP's answer to NC WARN Data Request 1-3: DEP has reported publicly that it expects demand in the Western North Carolina region to grow 15% in the next decade, included as Attachment B.

⁷ See DEP's answer to NC WARN Data Request 1-13, including as Attachment B.

12. The applicant, DEP, has the burden of proof to show the plant is in the public interest. DEP does not provide sufficient information to determine how much this plant would raise rates in its 30-year expected lifetime, nor how much the cost of additional infrastructure including natural gas pipeline upgrades, compressor stations, and transmission upgrades would impact rates.

c. POTENTIALLY LOWER-COST, LOWER-RISK DISTRIBUTED GENERATION (AND ENERGY EFFICIENCY) ALTERNATIVES EXIST, BUT HAVE NOT BEEN ADEQUATELY EVALUATED

13. In my professional opinion, the DEP load growth forecast is unsupported and conflicts with the static or declining actual peak load trend in the Western Carolinas over the last eight years. Use of a realistic load forecast eliminates the stated need for the WCMP. Aside from the lack of need for the project, there are alternatives of comparable or less cost to DEP's proposed 750 MW of natural gas power plant(s).

14. Distributed generation, demand response (DR), energy efficiency (EE), combined heat and power (CHP), purchased power and solar should be relied upon to displace fossil fuel generation in the Duke Energy Progress Western (DEP-West) North Carolina region over the next 10-15 years.

- a. Clean energy resources provide environmental and public health benefits, which DEP does not take into account in advancing the WCMP on economic criteria alone.
- b. DR is an effective, low cost alternative to reducing peak demand. A recent decision (late January 2016) by the U.S. Supreme Court validates the use of DR as a supply resource in wholesale power markets.⁹ DEP should expand use of low-cost DR in WNC to further reduce summer and winter peak electricity use.
- c. Approximately 60% of the heat in North Carolina is provided by inefficient electric heating systems.¹⁰ A methodical transition away from electric space heating should be the priority to reduce the winter peak load at the source, not investing in new combined cycle generation primarily to meet inefficient electric space heating load.

⁹ *Supreme Court Upholds FERC Order 745, affirming federal role in demand response*, by Gavin Bade, UtilityDive, 1/25/16: <http://www.utilitydive.com/news/supreme-court-upholds-ferc-order-745-affirming-federal-role-in-demand-resp/412668/>

¹⁰ See <http://www.eia.gov/state/print.cfm?sid=NC>, EIA's page for North Carolina, under heading Energy Source Used for Home Heating (share of households), listed as 61.4% electricity, 24.6% natural gas, 3.7% fuel oil, and 7.5% Liquefied Petroleum Gases.

15. New generation projects are not the only means available, nor the lowest cost, to assure grid reliability in the Western Carolinas. Reliability standards provide mechanisms for addressing low probability events that do not require adding additional generation or transmission capacity.
- a. NERC allows planned and controlled load shedding (also known as “demand response”) to meet low probability, multiple elements out-of-service Category C contingency events. This is a reasonable no-cost default alternative, acceptable to NERC and SERC for very low probability events that may never happen, as opposed to a \$1.1 billion investment in gas turbines, gas pipeline(s), and transmission system upgrades.
 - b. NERC and SERC also permit the consideration of probability in assessing whether a specific grid reliability scenario involving multiple contingencies, such as the simultaneous loss of two 230 kV line segments in the Asheville area, must be mitigated according to a generic deterministic reliability standard. To the extent that DEP is advancing the WCMP as the reliability solution to a specific low probability contingency event in the Asheville area, there may be a low- or no-cost administrative solution via SERC that would eliminate this grid reliability justification for the WCMP.
16. Please note the Petition to Intervene of Columbia Energy, LLC, filed in this docket on February 2, 2016, (and granted by the Commission on 2/4/16) asserting that Columbia has an existing 523 MW NGCC located in Gaston, South Carolina. Columbia states that it is ready, willing and able to provide this 523 MW of capacity and energy to DEP annually at DEP’s avoided cost for energy and capacity. Columbia states that it holds firm pipeline transportation contracts to access natural gas on existing pipelines. Columbia also states that the power would be provided at lower cost than DEP’s estimated cost.

William E. Powers

California All-Purpose Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document, to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

State of California
County of San Diego

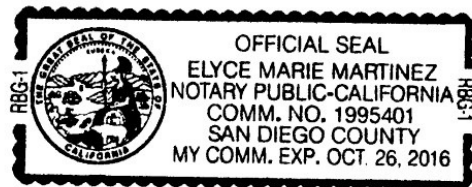
On Feb. 5th, 2016, before me, Elyce Marie Martinez, Notary Public,
personally appeared William E. Powers.
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity ~~(ies)~~ and that by his/~~her/their~~ signature~~(s)~~ on the instrument the person~~(s)~~ or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct

WITNESS my hand and official seal.

Elyce Marie Martinez
Signature of Notary Public



OPTIONAL

Description of Attached Document

Title or Type of Document Affidavit of William E. Powers
Document Date: 2/5/2016 Number of Pages (including this one) _____
Additional Information _____

Capacity(ies) Claimed by Signer

- ☐ Individual
- ☐ Corporate Officer- Title(s) _____
- ☐ Partner: Limited General
- ☐ Attorney-in-Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other

Signer is representing: _____

Right Thumbprint of
Signer 1

Right Thumbprint of
Signer 2