

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.

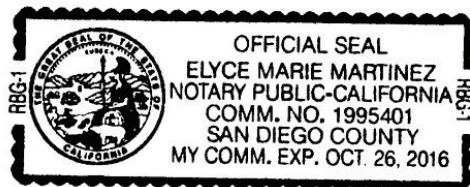
Name(s) of Signer(s)

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