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DATE: December 12, 2008
TO: Ann Cole, Commission Clerk - PSC, Office of Commission Clerk
FROM: Kay E. Posey, Executive Secretary to Commissioner McMurrian *KEP*
RE: Correspondence Received in Docket No. 080503-EI

Commissioner McMurrian received the attached letter from Mr. Alfred E. Kahn. Please place the letter in the file for the above-noted docket. Thank you.

Attachment

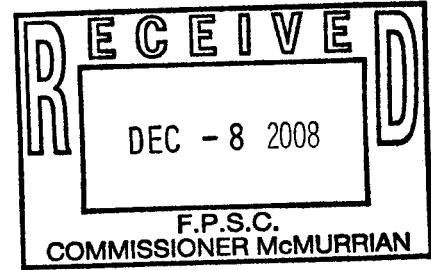
CC: Advisors to Commissioners

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ALFRED E. KAHN ASSOCIATES, INC.
308 NORTH CAYUGA STREET
ITHACA, NEW YORK 14850
TEL: (607) 277-3007
FAX: (607) 277-1581



December 4, 2008

The Honorable Matthew M. Carter, II,
Chairman
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Establishment Of Rule On Renewable Portfolio Standard
Docket No. 080503-EI

Dear Chairman Carter,

I am Alfred E. Kahn, Robert Julius Thorne Professor of Political Economy, Emeritus, at Cornell University; and Special Consultant to National Economic Research Associates, Inc. (NERA).

Background and Qualifications:

The Florida Industrial Cogeneration Association (FICA) has asked me to comment on the Florida Public Service Commission's (FPSC) proposal to establish a renewable portfolio standard (RPS), and on its proposed allocation among various renewable technologies of both credits for satisfying that standard and acceptable levels of cost.

In particular, FICA has asked me to consider whether the staff's proposed RPS would provide an economically efficient balance between cogeneration—including pure waste heat generation—and solar and wind technologies. As I propose to explain, I believe that, by over-specifying the allocation rules, the staff's proposal threatens to produce economically inefficient outcomes, violative of true conservation principles

My background for making this evaluation is both general and specific. My two volume *Economics of Regulation*,¹ I believe it is fair to say, is the standard if not classic statement of the applicable regulatory principles. More concretely, I have served in various regulatory positions, including Chairmanship of the New York Public Service Commission and U.S. Civil Aeronautics Board. I have also been the Advisor to the President (Carter) on Inflation, and Chairman of the (U.S.) Council on Wage and Price Stability. I have served on a variety of other public and private boards and commissions, several of which dealt with environmental issues, including the National Academy of Sciences Advisory Review Committee on Sulfur Dioxide

¹ Alfred E. Kahn, *The Economics of Regulation: Principles and Institutions*, Volume I: *Economic Principles*, published 1970; Volume II: *Economic Principles*, published 1971 by John Wiley & Sons, Inc., New York, NY; reprinted by MIT Press in 1988.

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Emissions and the Environmental Advisory Committee of the Federal Energy Administration. I also served on the Executive Committee of the National Association of Regulatory Utility Commissioners, and as Chairman of its Committee on Electric Power. In these several roles, I testified before the Senate Committee on Finance, in successful support of H.R. 6860, "The Energy Conservation and Conversion Act of 1975," July 18, 1975, specifying in particular the obligation of electric distribution companies to purchase the power of qualified independent generating facilities, at avoided or incremental costs, in the interest of both environmental protection and energy conservation.

The Economics of the proposed RPS

In 2006, the Florida State Legislature enacted an omnibus energy bill² "to promote the development of renewable energy, protect the economic viability of Florida's existing renewable energy facilities, diversify the types of fuel used to generate electricity, lessen Florida's dependence on natural gas and fuel oil, minimize the volatility of fuel costs, encourage investment in the state, improve environmental conditions, and minimize the costs of electricity for customers." This bill was amended in 2008 by HB 7135, which specified the parameters of the RPS program as well as control procedures, cost recovery for utilities and monitoring requirements. It also permitted (but did not require) the Commission to "give added weight to energy provided by wind and solar photovoltaic over other forms of renewable energy."

In pursuit of these objectives, the proposed RPS rule gives preferential weight to wind and solar technologies, in two ways. First, at least 25% of the resources used to meet the RPS must come from such energy systems (denominated Class I in the rule). Second, in order to "protect ratepayers", the state sets a cap on expenditures by the states' IOUs for meeting the RPS standard—2% of their retail revenues. These shares would in turn be subject to allocation between Class I resources and the other renewable technologies (Class II)—1.5% for wind and solar and 0.5% for everything else. To put these figures into perspective, the staff calculates, on the basis of 2007 data, that the amount permitted for meeting the RPS for all of Florida would total more than \$370 million—roughly \$277.5 million for wind and solar and \$92.5 million for all other renewable sources.

The discussion in the Memorandum³ accompanying Staff's proposed rule provides its rationale for this preference for solar and wind over all other sources of renewable generation:

Staff added the compliance cost allocation methodology to the draft rule primarily in response to the comments of the solar industry at the Commission's workshops. Staff agrees that additional support through dedicated funds for solar and wind resources is needed to encourage the development of these resources in Florida. Section 366.92(3)(b)3, F.S., allows for the rule to provide added weight to these beneficial resources. Because the rule includes a carve out for solar and wind

² (SB 888). Section 366.92, F.S.

³ FPSC Memorandum to the Commission, Docket No. 080503-E1 - Establishment of rule on renewable portfolio standard, Oct. 2, 2008, pg. 4.

resources, staff also believes that dedicated funds are needed to encourage the development of non-Class I resources.⁴

This is precisely the point that seems to me misguided.

Evidently I am not alone in this concern. The Memorandum reports that “[s]everal interested parties do not believe the rule should contain special treatment for specified resources, such as solar and wind. The Office of Public Counsel (OPC), for one, does not support carve outs or set asides, and believes that the market should determine the renewable resources that should be in each utility’s portfolio based on relative economics. OPC states that in an environment of rapid technological changes, the rule should not favor one technology over another.”⁵

Notwithstanding my conviction that regulation is needed where markets fail, I have long proclaimed the superior wisdom of competitive markets over administrative fiat where effective competition does or can prevail. For this reason, I share the concerns of OPC and others that in this case the staff is recommending that the Commission exercise its regulatory powers counter-efficiently, and therefore at the expense of consumers. By pre-specifying a strong preference for solar and wind technologies, the rule in effect acts to discourage the development and application of consistent new lower-cost technologies, some that may still be incubating in some creative brain, that may provide the desired societal outcomes more efficiently—that is, at lower cost to ratepayers. This seems to me to be violative of true conservation principles as well as inconsistent with the dictates of the Florida Legislature and also with good economics.

Let me be crystal clear: I am not suggesting that solar or wind are generally inferior to other renewable resources. I merely suggest that they are not inherently superior, neither economically nor aesthetically, to at least some other renewable technologies; and the clear preference for them in the proposed rules is both unwarranted and likely to impose a burden on ratepayers already burdened by soaring energy costs.

I of course respect the intentions behind these proposals. I firmly believe, however, that they are misguided. Substituting the staff’s or even the Commission’s judgment of which technologies best meet the needs of Florida ratepayers, as expressed in SB 388/HB 7135, rather than relying on the competitive market forces acting on the supply side seems both needlessly overreaching and likely to be uneconomic. The Legislature has explicitly described the kinds of results Florida seeks to achieve in pursuing generation from renewable resources, and has set out the technologies that it believes may be worthy of special encouragement. In my view, however, the proposed PRS rule would be much improved in terms of economic efficiency—which means in terms of the balance of costs and benefits to ultimate consumers—if it were to define desirable outcomes rather than prescribe the choice of inputs. Technologies that provide the same kinds of environmental, cost, security and other economic benefits should receive the same encouragement. The current proposal violates this elementary rule and in so doing will impose unnecessary costs on consumers.

⁴ Ibid, pg. 33.

⁵ Ibid, pg. 22.

This defect, in my view, applies to at least some of the Class II resources. I have been an ardent supporter of cogeneration ever since I became Chairman of the New York State Public Service Commission, 34 years ago, because it involves the generation of electricity from heat that *would otherwise be wasted*. The under-appreciation of this particular technology under the proposed rule is simply unjustifiable. By limiting access to the preferred Class I treatment, the rule implicitly places a lower value on conservation of heat recovery, which provides precisely the economic and environmental benefits sought by the Florida RPS legislation.⁶ The economic result of the technology preference in the proposed rule would be reduced cogeneration. Even if the staff assumes that such capability would be provided instead by the Class I resources, it is ignoring the benefits from profound differences in operating characteristics between intermittent and non-intermittent technologies, differences that translate into differences in cost to ratepayers.

This is especially the case for output from the exothermal heat recovery generation—often referred to as “pure waste heat” generation systems.⁷ As I understand them, these systems generate electricity from a chemical reaction inherent in an industrial process, such as in the manufacture of fertilizer. Moreover, they have other less obvious benefits:

- They have minimal effect on land use, because the generation facilities are located inside existing industrial complexes: in obvious contrast, new wind projects require the dedication of many acres of land, and as a result frequently provoke public protest. This is an advantage they share with other types of cogenerators as well. Typical sulfuric acid pure waste heat generators, for example, have capacities generally ranging between 8 and 50MW. A wind generation facility with the same capacity could require 2.5 to 16.5 acres⁸ dedicated to the project; a similarly sized solar facility 35 to 200 acres, according to the experience of one of the most recent such installations in the nation, the Nevada Solar One project.⁹
- Pure waste heat generation in fertilizer applications needs no additional water.
- Since pure waste heat generation is related to an industrial process, it is typically located in areas that already have substantial transmission capacity inflow to the project site and surrounding industrial complexes. In contrast, one of the most pressing issues in incorporating renewables into the integrated grid is that areas with highest rated wind resources are not typically located near abundant transmission facilities. This is true also of

⁶ I am here not considering cogeneration systems that employ supplemental heating from combustion of fossil fuel. In those cases, there is a trade-off of environmental degradation for increased production efficiency.

⁷ These projects are similar to two others being developed in China that have been validated to meet criteria set forth in Article 12 of the Kyoto Protocol and “thus result[s] in reductions of greenhouse gas emissions that are real, measurable and gives long-term benefits to the mitigation of climate change.” The validation reports can be found at <http://cdm.unfccc.int/UserManagement/FileStorage/BYAQHHJY6LACLOMFD5TURC6P4HMRT7> and, <http://cdm.unfccc.int/UserManagement/FileStorage/DVOG4ULWGO8OSWXVNW9FMKZ3WV13LV>.

⁸ This calculation is taken from the National Renewable Energy Laboratory (NREL) wind farm area calculator, assuming 1MW turbines each requiring 0.5 acres of land to site and ignoring the land between towers on the assumption that it could serve other uses as well. The calculation can be found at http://www.nrel.gov/analysis/power_databook/calc_wind.php.

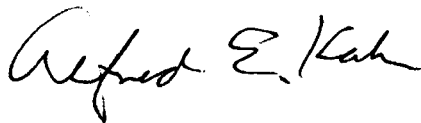
⁹ Information about the plant can be found at <http://www.nevadasolarone.net/the-plant>.

large scale solar projects in Florida, where the sites available for solar generation are commonly located in sparsely populated areas, with limited transmission capacity.

- Pure waste heat generation is a proven mature, reliable technology that operates at high availability and capacity factors characteristic of utility base-load generating plant. In contrast with wind and solar, they are not intermittent, and their output can be varied between local internal consumption and export to the grid. As a result they can help offset transmission bottlenecks by adding a source of power where there is significant local demand. They can also provide voltage and frequency support during utility generation capacity shortfalls.
- Pure waste heat generation is typically available when and where the industrial complex is operating to make its core products, and replaces consumption from the grid. Therefore there is a strong relationship to offsetting fossil fuel-fired utility company generation and the associated emissions.
- Like solar and wind, pure waste heat generation resources help to diversify fuel supplies and lessen Florida's dependence on foreign oil or coal and natural gas imported from other states. All three can provide jobs for Floridians; pure waste heat has the added benefit of keeping viable existing Florida-based industry and the jobs it provides.

In sum, there is no source of power superior to cogeneration and pure waste heat recovery. Any discrimination against them is, quite simply, indefensible—economically, aesthetically, environmentally and in terms of national as well as state energy policy.

Sincerely yours,



Alfred E. Kahn
Robert Julius Thorne Professor of Political Economy,
Emeritus, Cornell University
Special Consultant, NERA Economic Consulting

Cc: Honorable Nancy Argenziano, Commissioner
Honorable Lisa P. Edgar, Commissioner
Honorable Katrina J. McMurrian, Commissioner
Honorable Nathan A. Skop, Commissioner
Michael G. Cooke, General Counsel
Charles Hill, Deputy Executive Director
Cynthia Muir, Director of Public Information
Jack Shreve, Esquire, Senior Counsel to the Governor, Office of Governor Charlie Crist,
State of Florida, The Capitol, Tallahassee, Florida 32399
Rich Zambo, Esquire