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EXECUTIVE DIRECTOR

New York State Foundation for
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(NYSTAR)

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ALBANY, NEW YORK 12207

Thursday, 10 April 2008

Honorable Jaclyn A. Brilling,
Secretary
New York State Public Service Commission
Three Empire State Plaza
Albany, New York 12223

Re: Case 07-M-0548 – Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard

Dear Secretary Brilling:

Hand delivered are an original and five copies of the Initial Brief submitted by the New York State Foundation for Science, Technology and Innovation (NYSTAR) regarding the Ruling on Staff Motion for Reconsideration and Revising Schedule released March 20, 2008. The document also has been emailed to the Active Party List.

Thank you for your time.

Sincerely,

Paul P. Jesep,
Counsel

cc: Active Party List - email

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STATE OF NEW YORK

PUBLIC SERVICE COMMISSION

Proceeding on Motion of the
Commission Regarding an
Energy Efficiency Portfolio Standard — Case 07-M-0548

REPLY BRIEF OF

NEW YORK STATE FOUNDATION FOR SCIENCE, TECHNOLOGY AND INNOVATION (NYSTAR)

TO THE ADMINISTRATIVE LAW RULING OF MARCH 2008

Edward Reinfurt,
Executive Director

Edward J. Hamilton,
Deputy Executive Director

Paul P. Jesep,
Counsel

Vonzell Jones,
Legal Intern

Dated: Thursday, 10 April 2008
Albany, New York

STATE OF NEW YORK

PUBLIC SERVICE COMMISSION

Proceeding on Motion of the
Commission Regarding an
Energy Efficiency Portfolio Standard — Case 07-M-0548

REPLY BRIEF OF NYSTAR

The brief filed by the New York State Foundation for Science, Technology and Innovation (NYSTAR) [1] addresses Issue One as outlined on page 10 of the Ruling on Staff Motion for Reconsideration and Revising Schedule released March 20, 2008. In Issue One, parties are encouraged to comment on previously submitted Fast Track proposals. In addition, NYSTAR takes this opportunity to offer a broader policy perspective on actions necessary in the short- and long-term to achieve the 15% energy reduction goal by 2015.

Original Order

On May 16, 2007, four Public Service Commissioners[2] ordered the creation of the Energy Efficiency Portfolio Standard (EEPS) Proceeding. They directed that it should be "*designed ultimately* to reduce customer bills, *stimulate*

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[1] The New York State Foundation for Science, Technology and Innovation (NYSTAR) is a public authority with a mission to create jobs and economic growth in the science, technology, and innovation sectors; invest in academic research programs that advance cutting-edge science; help transfer inventions from the laboratory to the market place; and guide the development of the State's overall science and research policy which includes helping to create alternative, sustainable energy resources.

[2] Commissioners present: Chairwoman Patricia L. Acampora, Maureen F. Harris, Robert E. Curry, Jr., and Cheryl A. Buley.

State economic development, and *create jobs* for New Yorkers"[3] (emphasis added). The Order further directed that the "Administrative Law Judge and the parties to the EEPS proceeding should ... Consider and prioritize end-user efficiency programs, *market transformation* approaches, *research and development* ..."[4] (emphasis added). Market transformation cannot occur without significant research and development.

Economic stimulation and research and development may at first blush appear to be better placed as part of a long-term strategy. On further review, however, the Commission would benefit from a more in depth discussion initiated now. Although it may seem premature, these components merit inclusion in the immediate design of a Straw Proposal. A Straw Proposal without a research and development aspect offers an incomplete list of outcomes. Every energy technology available today is a product of research.

Technologies now exist at the State's research institutions, due to research and development, that could be commercialized and implemented in the short-term. At the same time, by underscoring the importance of research and development the State will be planning for future investment. Energy demands will increase and thus require new and improved technology development.

NYSTAR respectfully recommends that: 1) the significant near- and long-term impact of research and development in furthering job growth, curtailing Global Warming, reducing energy dependence, fostering market transformation,

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[3] Case 07-M-0548, Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Instituting the Proceeding (issued May 16, 2007), p. 6.
[4] Ibid., p. 7.

and developing sustainable energy alternatives be better highlighted in any Fast Track Proposal; 2) that other State agencies with a technology focus be identified and utilized as primary collaborators, not as secondary resources nor incidental partners, in a Fast Track Proposal; and 3) the role of New York's research institutions, as well as community colleges, remain a constant in discussions and be part of any proposal.

Impact of Research and Development

The 15% reduction in energy use by 2015 is an extraordinarily ambitious goal that cannot be realized without research and development. It is important that the State aggressively explore and implement, where practical, changes to building codes and appliance standards to improve efficiencies. Public education about energy use and waste in the existing power grid also will contribute to reaching the 15/15 goal.

Yet these important approaches are inadequate. Sustainable levels of alternative energy cannot be reached this way in an expanding economy. A growing body of evidence makes this conclusion indisputable. Identifying existing, uncommercialized, technology at research institutions and committing to future research and development is essential.

i. Future Research and Development

Jeffrey D. Sachs, director and economist at Columbia University's Earth Institute, asked in a February 18, 2008 *Scientific American* article, "Can the world economy use four times more primary energy while lowering emissions by one

third?"[5] The answer is a resounding "No" if the current energy strategy is not radically overhauled.

"To reduce greenhouse gas emissions from our energy systems while maintaining energy prices at comparable levels today will take revolutionary change as opposed to evolutionary change," concludes Howard J. Herzog, a principal research engineer at the Massachusetts Institute of Technology (MIT).[6]

In the March 18, 2008 edition of *Scientific American*, Sachs wrote in "Keys to Climate Protection – Dramatic, Immediate Commitment to Nurturing New Technologies is Essential to Averting Disastrous Global Warning," that even "with a cutback in wasteful energy spending, our current technologies cannot support both a decline in carbon dioxide emissions and an expanding global economy."[7]

"Economists like to set corrective prices and then be done with it," he added, "leaving the rest of household and business decisions to the magic of the market. This hands-off approach will not work in the case of a major overhaul of energy technology. *We will need large-scale public funding of research, development* and demonstration projects; intellectual property policies ..."[8] (emphasis added).

Reducing and eliminating the concentration of atmospheric carbon dioxide, according to physics professor Martin Hoffert at New York University

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[5] Jeffrey D. Sachs, "Climate Change after Bali – Do the Math: Affordable New Technologies Can Prevent Global Warming While Fostering Growth," *Scientific American*, February 18, 2008.
[6] Elizabeth A. Thomson, "Aggressive Energy Research Needed to Curb Global Warming," MIT News Office, October 31, 2002.
[7] Jeffrey D. Sachs, "Keys to Climate Protection (extended version) – Dramatic, Immediate Commitment to Nurturing New technologies is Essential to Averting Disastrous Global Warming," *Scientific American*, March 18, 2008. See also Andrew C. Revkin, "Scientists Urge New Energy – Creation of Alternative Technologies Key to Curbing Global Warming," *New York Times*, April 6, 2008 (reprinted in the *Times Union*, Albany, NY).
[8] Ibid., Sachs.

can only be achieved through "scientific innovation … if we adopt an aggressive, global strategy for developing alternative fuel sources that can produce up to three times the amount of power we use today. Currently, these technologies simply don't exist – either operationally or as pilot projects."[9]

The answer to creating these technologies has and will continue to fall on research institutions. It should be remembered that all energy applications identified and being recommended for use today began in a research laboratory.

ii. Greater Commitment and Existing Technology

In February 2008, The Renewable Energy Task Force, chaired by then Lieutenant Governor David A. Paterson, issued its first report. Highlighted in the Executive Summary is the "Long-term commitment to research and development" that "will help develop and commercialize additional emerging renewable energy technologies as supported by existing state agencies and authorities to deliver reliable, clean energy to New York. Market development programs provide commercialization opportunities for products developed and tested by New York State research institutions and companies."[10]

The Renewable Energy Task Force observed that New York "is home to several public and private institutions that are leaders in the field of environmental and scientific research . . . Increasing the support available to these institutions as well as attracting additional R&D to the state will further

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[9] Thomson.

[10] "Clean, Secure Energy and Economic Growth: A Commitment to Renewable energy And Enhanced Energy Independence," The First Report of the Renewable Energy Task Force, Lieutenant Governor David A. Paterson, Chair, February 2008, p. iii.

expand this resource base and increase our competitive advantage at the national level."[11]

Especially notable is the Task Force's call for the establishment of a Center for Advanced Technology (CAT)[12] "with a focus on development and enhancement of processes and products involving renewable energy and bio fuel systems."[13] It should be highlighted, as reflected in Work Group IV's Report, that some CATs are engaged in renewable energy research and development. Alfred University's CAT is working with the RPI Energy CAT on fuel cells. The SUNY Albany CAT has created a test farm that will allow demonstration and continuous operation of prototype alternate energy products which incorporate nanomaterials and nanoelectronic components developed by the school. The CAT program offers many more opportunities for energy research and development.

Independent of the CAT program there are many successes at New York's research institutions that can, if fully utilized, make a large contribution in addressing the State's immediate energy needs. To do so technologies must be better identified and catalogued for potential short-term commercialization.

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[11] Ibid., p. 15

[12] In 1983, the CAT program was created under the Public Authorities Law Section 3102-b to encourage greater collaboration between New York industry and the State's research institutions. The program spurs technology-based research and economic development; encourages applied research collaboration and innovation with industry; promotes workforce development; better leverages State funds with investments from the federal government, industry, foundations, and not-for-profit economic development organizations, and increases the competitiveness of New York companies. Related to the CAT program is the Center for Advanced Technology (CAT) Development program which is designed to promote national and international research collaboration and innovation and to better leverage the State's research expertise and funding with investments from the federal government, foundations, businesses, venture capital firms, and other entities.

[13] Ibid., p. 16

- **Alfred University** is engaged in research at its Center for Environmental and Energy Research that includes nanoscale layered photocatalysts, recycling of silicon-wafers production wastes, emissions reduction of commercial glassmaking, and recovery and purification of hydrogen from mixed gas steams.
- **Clarkson University** is improving fuel cell design, developing dairy waste-to-energy, making advances in blade and turbine wind energy technology, and investing in research that improves motor design and truck efficiency.
- **Cornell University** is working on projects to convert lignocellulosic materials to ethanol, it is engaged in conversion research for waste vegetable oil to biodiesel, and the conversion of dairy-manure derived biogas to liquid fuels. Cornell also is the northeast SunGrant Initiative Center to further industrial biotechnology, agricultural biotechnology, and to develop biobased green products.
- **Rensselaer Polytechnic Institute (RPI)** is working in the area of energy-efficient solid-state lighting at its Lighting Research Center. Working with OSRAM SYLVANIA the Center has demonstrated a new lighting control system that allows electricity customers to reduce monthly utility bills by controlling their own peak electricity demand. RPI also is engaged in finding sustainable energy alternatives at its Center for Future Energy Systems (CFES). Current research areas at CFES include smart lighting, smart displays, renewable energy, and fuel cells and hydrogen.
- **Syracuse University** is developing industrial and residential cogeneration supercritical diesel fuel combustion systems, and CHP unit using biodiesel from soybean oil via supercritical oxidation.
- **SUNY Albany** is engaged in research that includes solar, biodiesel, hydrogen sensors, anaerobic methane digester, and hydrogen from mixed gas streams. Its Energy and Environmental Technology Applications Center (E2TAC) works toward the integration of microelectronics and nanotechnology in advanced energy and environmental applications.
- **SUNY Stony Brook** announced in October 2007 that it broke ground for the Advanced Energy Research and Technology Center to develop new and efficient sources of energy. Basic energy research initiatives at the Center include solar, wind, hydrogen, methane hydrates, solid state and polyelectrolyte membranes and conventional fuels like coal, shale, and fossil.

In addition to these initiatives, New York's high performance supercomputing resources, combined with the work of its exceptional researchers, will make the State's ability to reach its goals realistic.

In February 2007, the federal government called for a 22% increase in federal grant money for energy research. The National Renewable Energy Laboratory, a component of the National Bioenergy Center, helps advance the U.S. Department of Energy's goals to find alternative energy sources. It has set up a Technology Transfer Office to assist scientists and engineers "in the practical application of their discoveries." One beneficiary has and will be the Brookhaven National Lab in Upton, New York which is a leader in biofuel field testing, wind-energy design, and battery-material development, among other things.

As underscored by the former Lieutenant Governor, the integration, application, and increased support of research and development at research institutions along with high technology training programs at community colleges must be an integral part of any proposed energy solution.[14]

As discussed previously there are ongoing projects at research institutions that can, among other things, lead to transformational changes in energy supply and delivery, while other activities offer a more-immediate solution to energy needs.

An increased State investment at research institutions for energy development will better meet specific energy, conservation, and environmental

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[14] See in general, Case 07-M-0548, Energy Efficiency Portfolio Standards Proceeding Final Report – Working Group IV, December 5, 2007. See also "Clean, Secure Energy and Economic Growth: A Commitment to Renewable Energy and Enhanced Energy Independence," The First Report of the Renewable Energy Task Force, Lieutenant Governor David A. Paterson, Chair, February 2008, p. vi. The report highlights that "Renewable energy research, development, and installation are emerging job growth sectors. We recommend that the State align and expand existing accredited training programs to recruit and develop an abundant supply of highly skilled workers who can design, install and maintain renewable energy and energy efficiency systems across the state" which includes community colleges.

goals. Early investment will enable New York to reap energy, economic, and cost-saving benefits now and in the future.

Primary Collaboration

Some State entities have unique missions that should have a greater role in finding energy solutions. [15] It is important that they be a primary collaborator and not a secondary resource. Nor should they be viewed as merely advisory. In the case of NYSTAR, for example, it is statutorily charged with guiding the State's science and high technology policy.[16] It is through, in part, the promulgation of this policy and funding scientists and engineers at research institutions that energy alternatives will be conceived and nurtured.

University based research and development will create energy patents and licenses. This will have a direct and substantial impact on New York's economy. Hence, it will be vital to include as primary partners State entities that have an established, successful relationship with research institutions throughout New York. The infrastructure will permit more State entities to evaluate progress in energy technology development. This will enable State funds to be carefully targeted in research areas that hold the greatest promise for meeting New York's energy needs.

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[15] NYSTAR concurs that the New York State Energy Research and Development Authority (NYSERDA) should provide the primary leadership in meeting the 15/15 energy goals. Its reputation and the quality of its work is outstanding. Although the activities of NYSTAR and NYSERDA complement in several ways, the respective missions of each organization are distinct and independent. There are aspects of New York's energy needs that would be better addressed by NYSTAR, especially as it continues to work with research institutions to develop energy technologies. See in general: www.nystar.state.ny.us and www.nyserda.org . See also Case 07-M-0548, Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Corrected Ruling Presenting Straw Proposal (February 13, 2008).

[16] Public Authorities Law Section 3152.

Conclusion

For the reasons set forth above, we urge this Proceeding to give greater attention to research and development and to specifically identify additional State entities, such as NYSTAR, that can play an important role in finding energy solutions due to a record of success and having the necessary infrastructure in place.

Respectfully submitted,

Paul P. Jesep,
Counsel

Dated: Thursday, 10 April 2008
Albany, New York