

The Renewable Energy Task Force Report

Submitted to
Governor James E. McGreevey

April 24, 2003

I. Introduction

Governor James E. McGreevey established the Renewable Energy Task Force by Executive Order on January 28, 2003. The Task Force was created to make recommendations on how to increase the use and development of renewable energy in New Jersey. More specifically, the Task Force was charged with advising the Governor and the Board of Public Utilities on how to strengthen New Jersey's Renewable Portfolio Standard (RPS) for Class 1 renewable energy.¹ The RPS, adopted in 1999, requires that energy suppliers providing power to New Jersey supply a minimum percentage of power generated from renewable resources.

New Jersey already stands as a national leader in the development of renewable energy. New Jersey is the only Mid-Atlantic state to adopt renewable energy requirements of all retail energy suppliers. Moreover, through the New Jersey Clean Energy Program the state has one of the most aggressive funding mechanisms in the nation for promoting renewable energy. Since this program's inception in 2001, New Jersey has invested \$51 million in promoting the use of renewable energy.² In addition, in 2002 New Jersey's state government signed a contract to receive 12% of its power from renewable resources. This initiative has made New Jersey the cleanest powered state government in the country, and earned the state the 2002 Green Power Leadership Award from the U.S. Environmental Protection Agency and U.S. Department of Energy.

Despite all of these successes, however, the members of the Renewable Energy Task Force agree with the Governor's assessment that New Jersey can do even more to accelerate the development of renewable energy. As the Governor stated in Executive Order #45, the increased use of renewable energy has many benefits, including: reducing greenhouse gas emissions and other pollution; decreasing our reliance on fossil fuels, which can help protect energy prices from potentially volatile fossil fuel markets; promoting economic development around renewable energy industries; and increasing our security by relying on cleaner and more distributed sources of energy.

Accordingly, the Task Force respectfully submits this report, and the recommendations contained therein, to the Governor. The Task Force believes that these recommendations, if implemented, will further advance the development of renewable energy in New Jersey and the surrounding region, and will ensure that New Jersey continues to be a national leader in renewable energy.

II. Process and Methodology

¹ Class 1 renewable energy is defined in the Electric Discount and Energy Competition Act as "electric energy produced from solar technologies, photovoltaic technologies, wind energy, fuel cells, geothermal technologies, wave or tidal action, and methane gas from landfills or a biomass facility, provided that the biomass is cultivated and harvested in a sustainable manner"

² The Clean Energy Program funds initiatives to promote both renewable energy and energy efficiency. The program is currently funded at a total of roughly \$120 million per year.

The Renewable Energy Task Force consists of 16 members, including representatives from state government, environmental and consumer groups, wholesale energy providers, the renewable energy industry, utilities, regulators, academics and national experts (*see the appendix for complete biographies of Task Force members*). During the nine weeks since the Governor's appointment, Task Force members have held three in-person meetings and convened numerous conference calls in order to develop their recommendations. The Regulatory Assistance Project, supported by the National Council on Electric Policy, provided facilitation support for Task Force discussions.³ Staff support for this effort was provided by the New Jersey Department of Environmental Protection (DEP), the New Jersey Board of Public Utilities (BPU), and PJM Interconnection.⁴

In developing its recommendations, the Task Force analyzed available data on: the current renewable energy generation capacity in the region; the resources available for developing new Class 1 renewable generation capacity; and the costs of developing various types of renewable energy. Using this data, which was primarily provided by DEP, BPU and PJM, the Task Force developed multiple models for the potential for Class 1 renewable energy development in New Jersey and the surrounding PJM region. In addition to these models, Task Force recommendations were informed by discussions with multiple participants in the energy market, and by drawing on the considerable range of experiences and knowledge about all facets of the energy industry that exists among Task Force members.

The Task Force's final recommendations balance many factors, including: the financial costs to ratepayers of developing renewable energy; the time needed to develop energy generation projects; the environmental and health benefits of increased renewable energy usage; the potential for economic development around renewable energy industries; the security and reliability benefits of cleaner and more distributed forms of energy; the value of a decreased reliance on fossil fuels; the current state of the energy market; and the relative strengths and weaknesses of different types of renewable energy with regard to all of these factors.

After much deliberation, Task Force members have arrived at a set of recommendations that we believe are in the best interests of New Jersey citizens, and will help achieve the Governor's goal of making New Jersey the national leader in the development of renewable energy. The members of the Task Force unanimously endorse this report, and the recommendations therein.⁵

III. Task Force Recommendations

1. The Task Force recommends that the annual RPS requirement for Class 1 renewable energy be increased to 4% by 2008, doubling the existing requirement for 2008. The Task Force also recommends that the RPS requirement be set at 20% by 2020.

Some Task Force members believe that a greater increase in the 2008 RPS requirement would be appropriate; however, the Task Force agreed that closer analysis of available data

³ The Regulatory Assistance Project is a Vermont-based organization that advises state and national governments on energy policy.

⁴ PJM Interconnection is a limited liability company responsible for the operation and control of the bulk electric power system throughout major portions of five Mid-Atlantic states and the District of Columbia.

⁵ The views expressed in this report, however, do not necessarily represent the exact or official positions of the organizations represented by members of the Task Force.

would be necessary before such an increase were considered by the BPU. The Task Force also suggests that the BPU create a committee of the Clean Energy Council (*see Recommendation #14*), to develop a recommended schedule of portfolio requirement increases for every year from 2004 to 2007, and 2009 to 2019.

The Task Force recommends that the Board of Public Utilities adopt new requirements for the years 2004 through 2008, and the year 2020, by rule before the end of this year. The standards for 2004 through 2008 should not be reduced under any circumstances. A straw (or draft) schedule for 2009 through 2019 should also be included in this rule to frame the discussion on the availability and cost of renewable resources for this period. Final requirements for this later period, however, should not be adopted until greater data analysis can be completed.

In order to assist the development and financing of renewable projects, the Task Force feels it is important that RPS percentages must be established as minimum percentages, with the BPU having the authority to increase the percentages. RPS requirements after 2020 should be maintained at the 2020 level, until such time as there is more data available to adjust those requirements in an informed manner.

2. While the standards recommended above will send a clear signal to developers and investors that New Jersey is a fertile place for investment in renewable energy, a successful RPS policy must also have the flexibility to adjust to changes in technology, the economic climate, or the related policies of other states or the federal government that might occur over the long time horizon of the RPS policy. Accordingly, the Task Force recommends that the BPU should consider adjusting RPS percentages beyond 2008 in the event of: a) significant changes in technological or other development of renewable resources; b) significant changes in the cost or relative cost of renewable resources; c) development of a RPS in other PJM states; d) the implementation of a federal RPS; or e) further geographic expansion of the PJM regional transmission organization.

Any such changes that are made should be: prospective in nature, and not retroactive; should never reduce the RPS below the percentage of renewable energy that has already been achieved; and should be provided with two years notice to allow for orderly changes in investment plans, unless immediate changes are necessary to adjust for inappropriate market reaction to the RPS or significant and unanticipated changes at the regional or national level.

3. The Task Force recommends that renewable energy be counted toward compliance with the RPS requirements only if it is generated within, or delivered into, the integrated multi-state PJM system that serves New Jersey. Renewable energy generated outside the PJM region, as it was configured on January 1, 2003, must demonstrate that it is delivered into PJM by evidence of a contract or by applicable scheduling and delivery data from PJM. Finally, renewable resources from outside PJM should only be eligible to meet New Jersey's RPS if they are new facilities. "New" facilities are defined as those commencing construction on or after January 1, 2003. For renewable energy that meets these requirements, the renewable attributes of the energy can be unbundled and used to demonstrate compliance with the RPS (*see Recommendation #5*).

These requirements will ensure that the RPS is implemented in a manner that can be feasibly tracked and enforced, and that operates smoothly in conjunction with our current energy markets. As long as renewable energy is delivered into the PJM system, New Jersey should enjoy benefits from reduced fossil fuel generation in the PJM region, such as improved environmental and public health impacts and increased energy independence. Other recommendations contained in this report, as well as other state programs such as the Clean Energy Program, will further promote the development of renewable energy generation capacity specifically within New Jersey. Finally, the requirement that any generation outside of PJM must be new generation will ensure that the RPS drives the creation of new renewable generation capacity, and is not simply met with the transfer of energy from existing facilities.

4. The recommendations of this Task Force provide extensive incentives for the development of renewable facilities in New Jersey and the region; however, additional incentives are needed to allow the photovoltaic solar industry to become more viable in the regional marketplace. As such, the Task Force recommends that a comprehensive set of policies be developed that will enable substantial levels of photovoltaic solar generation capacity to be developed in New Jersey, thereby making New Jersey a leader in photovoltaic solar development. Specifically, the Task Force recommends setting a goal of 120,000 MWhs of new photovoltaic solar generation located within New Jersey by 2008, and developing policies designed to meet that goal.

Policies that would enable New Jersey to meet this goal must address current barriers to photovoltaic solar investment, including: offsetting the high upfront cost of photovoltaic solar power; addressing the photovoltaic solar power industry's need for additional credit support; increasing the availability of longer-term contracts that are needed to reduce the annual cost of photovoltaic solar power; and making standard contracts available to reduce transaction and marketing costs for smaller photovoltaic solar projects.

The Task Force considered a number of policies to address these existing barriers to investment in, and development of, photovoltaic solar facilities including the following four mechanisms:

- a) Requiring that a specific amount of renewable energy in each supplier's portfolio come from photovoltaic solar facilities located in New Jersey;
- b) Increasing the relative 'value' of each kilowatt hour of energy generated by New Jersey-based photovoltaic solar facilities toward meeting a supplier's RPS requirement (under a certificate-based system, the value of a photovoltaic solar certificate would be increased by a multiple, to be determined by the BPU; see recommendation #5 for a description of certificate-based systems).
- c) Establishing an administrative body responsible for ensuring that a designated number of photovoltaic solar certificates are included in the renewable energy portfolio of each supplier serving retail customers; setting the cost or price of the certificates; selling the certificates; and entering into long-term contracts and purchase agreements to acquire those certificates on behalf of New Jersey retail energy suppliers; and/or
- d) Mandating that a minimum percentage of the RPS Class 1 requirement be met with renewable energy produced from photovoltaic solar sources.

The Task Force also discussed the use of some of the above-listed options as a means of promoting Class 1 distributed generation⁶ more generally, as well as a means to promote clean renewable generation (for the purposes of this report, clean renewables are defined as zero-emissions renewables and clean biomass). The Task Force believes that there is value in developing appropriate policies for promoting these subsets of Class 1 renewable energy.

Given the limited time that the Task Force had to develop its recommendations, Task Force members do not feel they have adequately evaluated these options for improving the viability of photovoltaic solar energy in New Jersey. The Task Force suggests that a committee of the Clean Energy Council (*see Recommendation #14*) identify the most effective strategies, including but not limited to the above options, for meeting the goal of developing 120,000 MWhs of new photovoltaic solar generation in New Jersey by 2008. The Task Force suggests that a committee of the Clean Energy Council also continue to examine the appropriateness of similar policies for promoting other forms of Class 1 distributed generation and clean Class 1 renewable generation, more generally. Finally, this committee of the Clean Energy Council should evaluate the appropriateness of setting similar goals for other sources of customer-sited renewable energy, including wind, clean biomass, and tidal sources.

5. The Task Force recommends that a certificate-based program that tracks the renewable ‘attributes’ of energy separately from the actual energy should be utilized to track and implement the RPS requirement. Under such a program, the renewable attribute of the energy is ‘unbundled’ from the energy itself; that is, a renewable energy generator can sell its energy to one energy supplier and sell the renewable attribute certificate for that energy to a separate energy supplier, which would then use that certificate toward meeting its RPS obligation. The state should support the development of such a program by the PJM Generation Attribute Tracking System (GATS) Working Group. This unbundled certificate program will allow New Jersey to meet its progressive renewable energy goals in an efficient, enforceable, market-based manner that allows the trading of attributes as certificates.
6. The Task Force recommends that all retail suppliers in New Jersey be required to disclose the renewable attributes of the power they sell to customers on an annual basis. An annual accounting of renewable generation, as opposed to shorter time frames, is appropriate given the variable nature of electrical generation from renewable facilities.
7. The Task Force recommends that compliance with the RPS be enforced in two ways. First, the BPU should review the compliance filings by retail suppliers to ensure that they have an appropriate and verifiable mix of renewable resources in their supply mix. Suppliers should be given the opportunity to address any shortfalls in compliance with the RPS during a given year by making up that difference the following year, provided that a supplier is not allowed to continue a shortfall beyond the following year.

⁶ Distributed generation is the use of small-scale power generation technologies located close to the entity that is using the electricity.

Second, retail suppliers should have the opportunity to achieve compliance with the RPS through an alternative compliance payment (ACP). The ACP would allow retail suppliers to make a payment of a dollar amount per MWh to cover any shortfall in the supplier's purchase of renewable certificates. ACP levels should be set at an amount higher than the incremental cost of eligible renewable generation. The BPU should set ACP levels on a periodic basis and with adequate notice in order to provide greater certainty to retail suppliers and to protect the interests of ratepayers.

The ACP will protect suppliers and their retail customers from an unanticipated failure of the market to yield enough renewable energy to meet the RPS requirements or from an unanticipated increase in the cost of renewable certificates. The ACP should not be used, however, as a permanent substitute for suppliers meeting their RPS requirements, but rather a temporary alternative form of compliance due to unexpected circumstances. All ACP funds should be used for the development and use of renewable energy through the New Jersey Clean Energy Program.

8. The Task Force recommends that the BPU, working in consultation with DEP, PJM, the GATS Working Group, utilities and other interested parties, develop a protocol, based on accepted engineering practices, to encourage the output of customer-sited renewable facilities in New Jersey to qualify for the RPS.⁷
9. The Task Force recommends that the BPU, working with suppliers, utilities and other stakeholders, develop a statewide program that would offer retail electric customers the option of selecting an energy product or products with a higher level of renewable energy than is required by the RPS. This option should be available to all retail electric customers in the state via a sign-up option on utility bills. Green power sales in this voluntary program must use renewable energy that is not otherwise used to meet a supplier's RPS requirements and should include full disclosure of the power supply mix utilized by the suppliers participating in the program.

This program, which would allow customers to select a product with even greater renewable energy content at a potentially higher cost than basic generation service, would provide additional incentives for the development of renewable energy facilities throughout the region.

10. The Task Force recommends that the BPU develop a program that allows utility customers to make additional financial contributions to the New Jersey Clean Energy Program, via a check-off option on utility bills. The revenues from this check-off would be used to further increase investment in renewable energy in New Jersey.
11. The Task Force recommends that the BPU work closely with the New Jersey Economic Development Authority and other state financing authorities to develop financing and credit support programs tailored to the needs of renewable project development in New Jersey.

⁷ Customer-sited generation refers to smaller generation facilities that are located on the customer-side of the electrical meter, and therefore directly offset end-use electricity demand-

12. The Task Force recommends that New Jersey be a strong advocate for the development of renewable portfolio standards by other states in the region. Participation by other states would further promote the development of renewable energy, and enhance the many benefits of establishing a RPS. Increased participation by neighboring states could eventually be developed into a regional RPS requirement, creating a more seamless market for the development of renewable energy in the region. To further that goal, where a non-PJM state within the region has adopted a RPS requirement that is similar to New Jersey's, the Board should consider policy options such that renewable attribute certificates from otherwise eligible new renewable generators located in such a state could be eligible under New Jersey's RPS requirements without an electricity delivery requirement, provided that renewable energy generation located in New Jersey is treated similarly under that state's RPS requirements.
13. The Task Force recommends that the BPU implement many of the recommendations contained in this report through rulemaking proceedings to address issues not fully explored in this report, including but not limited to cost recovery, reporting requirements, and the impact that changes in the RPS will have on renewable energy markets, consumer prices and retail competition.
14. Given the short time frame in which it has had to develop its recommendations, there are some matters that the Task Force has not adequately analyzed. Because there is additional valuable work that can be done to further refine, expand on, and help implement the recommendations contained in this report, the Task Force recommends that a committee of the BPU's Clean Energy Council be created to provide further recommendations to the Board, through the Clean Energy Council, on renewable energy and the RPS.⁸

⁸ The Clean Energy Council is an advisory body to the Board of Public Utilities that makes recommendations regarding the New Jersey Clean Energy Program.

GOVERNOR'S RENEWABLE ENERGY TASK FORCE

Chair:

JEANNE M. FOX, President, New Jersey Board of Public Utilities

Members:

BRADLEY M. CAMPBELL, ESQ., Commissioner, New Jersey Department of Environmental Protection (Dante DiPierro, Designee)

SEEMA M. SINGH, ESQ., Executive Director, Ratepayer Advocate and Public Advocate Designate

MERIDITH WINGATE, International/Renewable Certificates Program Manager, Center for Research Solutions

STEVEN GABEL, President, Gabel Associates

DAVID R. WOOLEY, ESQ., Regional Director, American Wind Energy Association

DR. WILLIAM J. MAKOFSKE, Professor, Ramapo College

LEAH GIBBONS, Co-Chair, PJM Generation Attributes Tracking System

MARK S. BROWNSTEIN, ESQ., Director, Environmental Strategy and Policy, PSEG

EMILY RUSCH, Energy Advocate, NJPIRG

DR. VICTOR E. UDO, Manager, Technology/R&D, Connectiv Power Delivery

R. BRENT ALDERFER, ESQ., President, Community Energy, Inc.

RYAN WISER, Scientist, Lawrence Berkeley National Laboratory

LYLE RAWLINGS, P.E., President, Mid-Atlantic Solar Energy Industries Association

KATHERINE HEIL HAMILTON, Co-Director, American Bioenergy Association

RICHARD SEDANO, Facilitator, Director, Regulatory Assistance Project

Biographies

JEANNE M. FOX, President, New Jersey Board of Public Utilities; Task Force Chair

Jeanne M. Fox was named by Governor James E. McGreevey as President to the Board of Public Utilities (BPU) on January 15, 2002. President Fox also serves as a member of the Governor's Cabinet. In addition to her duties at the Board, President Fox also serves with the National Association of Regulatory Commissioners as a member of the Ad Hoc Committee on Critical Infrastructure and the Committee on Energy Resources and the Environment.

Prior to her nomination, Ms. Fox was Regional Administrator of the United States Environmental Protection Agency from 1994 to 2001. As Regional Administrator, Ms. Fox had jurisdiction over environmental issues and activities in New Jersey, New York, Puerto Rico and the U.S. Virgin Islands. Ms. Fox, from 1991 to 1994, served as Deputy Commissioner of the New Jersey Department of Environmental Protection & Energy. She served as Acting Commissioner between July 1993 and February 1994. Ms. Fox received a Bachelor's Degree from Douglass College, Rutgers University in 1975 and a Juris Doctor from the Rutgers University School of Law in 1979.

MERIDITH WINGATE, International/Renewable Certificates Program Manager, Center for Research Solutions

Meredith Wingate is a nationally recognized expert on verification systems for renewable energy. Ms. Wingate is currently employed by the Center for Resource Solutions (CRS) as the International/Renewable Certificates Program Manager. Ms. Wingate is leading CRS's tradable renewable certificate projects, which are focused on providing policy assistance to states and regional groups working to form certificate-tracking programs for regulatory compliance purposes. Ms. Wingate is leading a national initiative to create a network of renewable certificate issuing and tracking bodies. Ms. Wingate has a Master of Environmental Management in Resource Economics and Policy from Duke University, Nicholas School of the Environment. She also holds a Certificate in Hazardous Materials Management from the University of California at Berkeley and a B.A. in Political Science from the University of Colorado at Boulder. Her previous work experience has been in the field of environmental compliance for the Port of Oakland, San Francisco Solid Waste Transfer and Recycling Facility and US EPA Region IX.

STEVEN GABEL, President, Gabel Associates

Steven Gabel is an expert on energy markets, particularly in the PJM region. Mr. Gabel is President of Gabel Associates, a consulting firm that assists clients in strategic energy issues, negotiations with utilities and other suppliers and regulatory matters. Gabel Associates currently provides energy planning, procurement and financial advice, strategic analysis and expert testimony to a wide range of public and private sector clients. Steven Gabel has provided extensive expert testimony on energy and public utility issues and has participated actively in restructuring issues in New Jersey, PJM and the New York ISO. He is an economist with a background in pricing, industrial organization, public policy and the history of economic thought.

From 1983 to 1990, Steven Gabel served as the Director of the Electric Division of the New Jersey Board of Public Utilities, where he worked extensively on various utility rate cases and developed and implemented rate setting, alternative energy, demand side management, incentive regulation, cost of service and tariff design initiatives. From 1990 to 1993 he served as Director of Solid Waste Management at the New Jersey Board of Public Utilities and the New Jersey Department of Environmental Protection and Energy, where he directed the policies and activities of the only comprehensive economic and environmental solid waste program in the nation.

BRADLEY M. CAMPBELL, ESQ., Commissioner, New Jersey Department of Environmental Protection

Bradley M. Campbell is the Commissioner of the New Jersey Department of Environmental Protection (DEP). Prior to his nomination to be Commissioner of the DEP, Campbell was a visiting professor at the University of North Carolina's Law School where he taught classes on natural resources and the environment, property rights and the constitution, and contracts. In 1999, he was also appointed by President Bill Clinton to work at the U.S. Environmental Protection Agency as Regional Administrator for the Mid-Atlantic Region. Before this, he was the Associate Director of the White House Council on Environmental Quality where he was responsible for all toxic and environmental protection matters from 1995-1999.

From 1990-1994 he was an attorney-advisor for the U. S. Department of Justice, Environment and Natural Resources Division where he was responsible for trial and appellate litigation and advised client agencies and the Assistant Attorney General on a range of environmental issues. Campbell earned his J.D. in 1987 from University of Chicago Law School and his B.A. in History from Amherst College in 1983.

DAVID R. WOOLEY, ESQ., Regional Director, American Wind Energy Association

David Wooley is a national expert on renewable energy, with particular expertise in generation from wind turbines. Mr. Wooley serves as the Regional Director for the American Wind Energy Association (AWEA) and has testified on behalf of the organization on an array of issues, including transmission policy, interconnection requirements, management of state clean energy funds, state power purchase agreements, and renewable portfolio standards (RPS). On March 1, 2003, David also assumed the position of Vice President of the Energy Foundation, with responsibility for domestic grants to public interest groups working on energy policy reform, but he will continue to work with AWEA on implementation of the New York RPS requirement.

Mr Wooley is a founding partner of Young, Sommer, LLC., an Albany New York law firm specializing in environmental, land use, municipal, facility siting and energy law. Previously he has served as Professor for Environmental and Energy Law, and as both Executive Director and Counsel to the Pace Energy Project. Previously he served as Assistant Attorney General for the State of NY, specializing in litigation and lobbying on air pollution issues from 1980-1990 and was lead counsel for a coalition of northeastern states and national environmental groups in a litigation campaign to stop acid rain. Prior to joining the NY Attorney General's office, David managed an environmental law center for legal services programs in West Virginia.

DR. WILLIAM J. MAKOSFSKE, Professor, Ramapo College

Dr. William J. Makofske received his Ph.D. in physics from Rutgers University and has been a faculty member at Rutgers University, University of Minnesota and Columbia University. His main area of interest has been on physics and the environment where he has focused on the environmental impacts of energy production, computer modeling of environmental systems, alternative energy sources, radon, and global climate change. Dr. Makofske has been a visiting scientist at the Building Research Establishment in England and at Argonne National Laboratory in Illinois. In 1999, he received a Fulbright Fellow in alternative energy and environmental protection in Germany. Currently, Dr. Makofske teaches courses in the physics, environmental science and environmental studies majors at Ramapo College of New Jersey.

Dr. Makofske has conducted research and written numerous books and articles on a range of technology and environmental issues. Dr. Makosfke has expertise in global climate change and regional/global air pollution; the development and assessment of energy technologies; the design and construction of appropriate technology projects, including solar greenhouses, passive solar buildings, wind electric and water pumping, and intensive biological agricultural systems; development of software for passive solar design and passive solar design tools, including large thermal network computer models for predicting building performance; global environmental problems; interaction of science, technology and public policy; and studies in theoretical and experimental nuclear physics.

LEAH GIBBONS, Co-Chair, PJM Generation Attributes Tracking System

Leah Gibbons is co-chair of the PJM Generation Attributes Tracking System (GATS) Working Group. The GATS Working Group serves as an advisory body to the PJM Regional Transmission Organization (RTO) on the development and implementation of a verification system to support environmental disclosure, renewable portfolio standards, and other reporting requirements adopted by states in the PJM energy market.

Ms. Gibbons, with more than eight years in the energy industry, is director of external relations of PG&E National Energy Group. Gibbons is responsible for legislative and regulatory affairs in the Mid-Atlantic region. Gibbons joined PG&E National Energy Group in 1998 from Washington International Energy Group of Washington, D.C., where she was senior policy analyst, assisting

Japanese utility clients by analyzing and reporting on electric industry restructuring trends. In addition, Gibbons managed the research and production of the Washington International Energy Group's *Electric Industry Outlook*, an annual publication based on a survey of electric power business decision-makers. Gibbons received her bachelor's degree in public service from Pennsylvania State University and a master's degree in public affairs and policy analysis from the University of Wisconsin's Lafollette Institute of Public Affairs.

MARK S. BROWNSTEIN, ESQ., Director, Environmental Strategy and Policy, PSEG

Mark Brownstein is Director of Environmental Strategy and Policy for Public Service Enterprise Group (PSEG), where he is responsible for environmental leadership; ~~In addition, M~~shaping changes in environmental laws and regulations; and initiating corporate policies that enable affected PSEG companies to comply with these changes. Previously, Mark was an environmental issue manager for PSE&G, the utility subsidiary of PSEG, where he was responsible for shaping the utility's policies on air quality issues. He was active in the Environmental Council of States' (ECOS) 37-state Ozone Transport Assessment Group (OTAG) and the US EPA's FACA Subcommittee for Ozone, PM, and Regional Haze.

Before joining PSEG, Mark maintained a private practice in environmental law and policy based in Hoboken, New Jersey. Mark's career in environmental policy began with the New Jersey Department of Environmental Protection's Office of Air Quality Management, where he participated in the formulation of air quality plans for achieving the federal health standard for ozone in New Jersey. Prior to that, he was an aide to then-Congressman Robert G. Torricelli. Mark received a law degree from the University of Michigan Law School in 1991, and a Bachelor of Arts degree from Vassar College in 1987.

SEEMA M. SINGH, ESQ., Executive Director, Ratepayer Advocate and Public Advocate Designate

SEEMA M. SINGH, ESQ. is the Public Advocate-designate pending restoration of the Department of the Public Advocate. A member of Governor James E. McGreevey's cabinet, Ms. Singh is currently serving as Acting Director of the Division of the Ratepayer Advocate, where she is responsible for ensuring that all classes of utility consumers receive safe, adequate and proper utility service at affordable rates that are just and nondiscriminatory.

A graduate of Seton Hall University School of Law, Ms. Singh, who is licensed to practice law in New Jersey, worked in the Litigation/International Law Department of the Princeton, NJ, firm of Pepper Hamilton from March 2001 until her public appointment. Ms. Singh previously was an associate with the law firms of Reed Smith and of Fox, Rothschild, O'Brien & Frankel. She clerked for the Hon. Patrick J. McGann, Presiding Judge, Chancery Division, Monmouth County Superior Court, and served an internship with the Hon. Dickinson R. Debevoise, Senior Judge of the U.S. District Court in Newark. Ms. Singh is a graduate of Seton Hall School of Law (JD, '95), Rutgers University with highest honors (BS '88), Bachelor of Science in Zoology (Calcutta, India '83).

EMILY RUSCH, Energy Advocate, NJPIRG

Emily Rusch is the Energy Advocate for the New Jersey Public Interest Research Group (NJPIRG). For the past 30 years, NJPIRG has advocated for clean and sound state energy policies that protect New Jersey consumers and the environment. For the past 18 months, Ms Rusch has led NJPIRG's campaign for a New Energy Future, focusing on cleaner and more efficient energy production and use. She has coauthored several reports on energy policy, including *Clean Energy Solutions: Energy Efficiency and Renewable Energy in New Jersey* and *Micropower and the Crossroads: Public Health and the Future of Distributed Generation*.

Prior to joining NJPIRG, Ms. Rusch worked for CALPIRG, developing grassroots support for the passage of California's Clean Water Enforcement Act. She is a graduate of Willamette University in Salem, Oregon, where she earned a bachelor's degree in history and Spanish.

DR. VICTOR E. UDO, Manager, Technology/R&D, Connectiv Power Delivery

Dr. Victor E. Udo is currently the Manager, Technology/R&D at Connectiv Power Delivery, where he is responsible for new technology review and testing, including renewable energy resources and other emerging energy system technologies. His other positions at Conectiv were manager of delivery process, and manager of planning and performance. Dr. Udo worked at Atlantic Energy, prior to its merger with Delmarva Power to create Conectiv, where he had engineering, system planning, marketing, process transformation and corporate performance management responsibilities.

Dr. Udo completed his Ph.D. in Urban Affairs and Public Policy from the University of Delaware in 2002 where he was affiliated with the Center for Energy and Environmental Policy (CEEP). Dr. Udo has master degrees in Engineering and Energy/Environmental Policy from Howard University and the University of Pennsylvania, respectively. He also holds a BSEE (Power Systems, cum laude) from Howard University. In addition, he is a graduate of the Public Utility Executive Program at the University of Idaho. Dr. Udo has been a member of the Distribution Committee of Edison Electric Institute (EEI). He is a Member of the Institute of Electrical and Electronic Engineers (IEEE) Engineering Management, Power Systems, Communications, and Social Implication of Technology Societies. Dr. Udo has refereed journal publications in electric power system research and a seminar paper on sustainable development policy.

R. BRENT ALDERFER, ESQ., President, Community Energy, Inc.

R. Brent Alderfer is President and co-founder of Community Energy, Inc., a wind energy marketing and development company in Wayne, Pennsylvania.

As President of Community Energy, Mr. Alderfer led the expansion of wind energy in the northeastern states over the past four years. Prior to founding Community Energy, Mr. Alderfer served as Commissioner of the Public Utility Commission and of the Air Quality Control Commission in Colorado. In 1999, Mr. Alderfer relocated to the eastern US, and led efforts to open the utility markets to distributed and renewable generation. A lawyer by profession and an

electrical engineer, Mr. Alderfer previously headed a commercial law practice, and brings commercial law and finance expertise to his current energy market development. A frequent speaker, he is known for his strong leadership in new energy market development.

Mr. Alderfer received a J.D. degree from Georgetown Law School in 1977, and an electrical engineering degree from Northeastern University in 1974.

RYAN WISER, Scientist, Lawrence Berkeley National Laboratory

Dr. Ryan Wiser is a scientist in the Electricity Markets and Policy Group at Lawrence Berkeley National Laboratory. He leads research in the planning, design, and evaluation of renewable energy policies, green power marketing opportunities, renewable energy economics, and electricity industry restructuring. Dr. Wiser regularly advises state and federal agencies in the design and evaluation system-benefits charge (SBC) and renewables portfolio standard (RPS) policies and has recently provided policy assistance to the states of New York, California, Oregon, Massachusetts, Rhode Island, and Texas. Dr. Wiser is working closely with the Clean Energy Funds Network, a collaborative organization representing most of the state renewable energy funds. Ryan's analytic work, which integrates economic, policy, and market analysis with a strong emphasis on the practical application of analysis findings, has included studies on the economics of wind power and the risk mitigation value of renewable electricity, and customer surveys of willingness to pay for renewable generation.

Prior to his employment at Berkeley Lab, Dr. Wiser worked for Hansen, McOuat, and Hamrin, Inc., the Bechtel Corporation, and the AES Corporation. He received a B.S. in Civil Engineering from Stanford University and holds an M.S. and Ph.D. in Energy and Resources from the University of California, Berkeley. Dr. Wiser has published numerous of research reports and journal articles on renewable energy markets and policy, including articles in *The Electricity Journal*, *Energy Policy*, *Corporate Environmental Strategy*, *Public Utilities Fortnightly*, *Utilities Policy*, and *Renewable and Sustainable Energy Reviews*.

LYLE RAWLINGS, P.E., President, Mid-Atlantic Solar Energy Industries Association

Lyle Rawlings is a professional engineer, licensed in New Jersey and Pennsylvania, with over twenty-six years of experience in the fields of alternate energy and energy conservation, first with Exxon Research & Engineering Company, then as the co-owner of GALE Corporation, an architecture/engineering firm specializing in energy conservation and alternate energy. Since 1988, Mr. Rawlings has been the President of Fully Independent Residential Solar Technology, Inc. (FIRST), which specializes in the design and development of photovoltaic power systems, other DC power systems, and sustainable community projects. Mr. Rawlings also serves as President of the Mid-Atlantic Solar Energy Industries Association (SEIA). Since 2000, Mr. Rawlings has been the President of Advanced Solar Products, the largest designer/installer of solar electric power systems in the Mid-Atlantic Region.

Mr. Rawlings is an authority in thermal storage system design. He is expert in the design of solar, fuel cell, hydropower, waste-to-energy, and cogeneration systems, in the design of zero-emission vehicles, and in the economic analysis of emerging technologies. He holds a B.S. degree in Chemical Engineering from West Virginia University.

KATHERINE HEIL HAMILTON, Co-Director, American Bioenergy Association

Katherine Heil Hamilton is Co-Director of the American Bioenergy Association, a national non-profit membership association advocating for progress in the production of power, transportation fuels, and chemicals from biomass. Ms. Hamilton is also the president of her own consulting firm, The Hamilton Group, specializing in information and advocacy on clean energy issues.

Ms. Hamilton has served as an advocacy sub-contractor for the Union of Concerned Scientists, garnering support for a national Renewable Portfolio Standard from the diverse national bioenergy community and organizing grass roots activism for energy bill measures in support of renewable energy. Prior to founding The Hamilton Group, Katherine managed government relations for the National Renewable Energy Laboratory (NREL) in Washington, D.C., where she acted as the single contact point for the laboratory in Congress, providing information and education to members and staff on energy efficiency and renewable energy science and technology. She also developed and managed the SAVEnergy Program, targeting and conducting energy and water audits of federal facilities nationally and internationally for the Department of Energy's Federal Energy Management Program (FEMP). Prior to her service at NREL, Ms. Hamilton was a Senior Analyst at Virginia Power, specializing in commercial energy efficiency.

RICHARD SEDANO, Facilitator, Director, Regulatory Assistance Project

Richard Sedano acted as facilitator to the Renewable Energy Task Force. Mr. Sedano is a Director with the Regulatory Assistance Project (RAP) in Montpelier, VT. RAP advises state and national governments on energy policy. Sedano joined RAP in 2001 and has written white papers on renewable energy, transmission siting, energy efficiency and other topics. Sedano was most recently with the Vermont Department of Public Service, where he served as Commissioner for nine years, and in engineering staff positions for seven more. The VDPS represents utility consumers in all regulatory matters, and is the state's energy office and consumer advocate. Sedano served as Chair of the National Association of State Energy Officials from 1998-2000. He is currently a member of the Advisory Committee to the ISO-New England Board of Directors and a member of the Board of Directors of Northeast Energy Efficiency Partnerships. Sedano has a BS in Engineering from Brown University and an MS in Engineering Management from Drexel University.