Draft New Jersey Energy Master Plan Implementation Strategies

A Companion Document to the Draft New Jersey Energy Master Plan
April 17, 2008

Conservation and Energy Efficiency

Reduce Peak Demand

Renewable Energy

Develop New Low Carbon Emitting, Efficient Power Plants and Close the Gap between the Supply and Demand of Electricity

Invest in Clean Energy Technologies and Businesses

Energy Efficiency Program for Existing Buildings

Strategy Description

Establish an integrated Energy Efficiency (EE) program for Existing Buildings, including and enhanced equipment replacement program, to remove barriers for broad adoption of and investment in energy efficiency in order to meet statewide Energy Efficiency Performance Goals (EEPG).

Energy Savings or Energy Production

The following are proposed Statewide 2020 EEPGs by sector for electricity, natural gas and heating oil:

2020 Energy Efficiency Performance Goals	Electricity GWH	Natural Gas TBTU	Heating Oil TBTU
EE 20% Reduction Goal	**20000**	**103.95**	**15.13**
Appliance Replacements			
Residential	**1710**	**14.48**	**1.58**
Commercial	**2044**	**8.26**	**0.48**
Industrial	**246**	**0.86**	**0.07**
Subtotal	**4000**	**23.60**	**2.14**
Existing Buildings			
Residential	**4759**	**40.34**	**4.49**
Commercial	**5690**	**23.01**	**1.38**
Industrial	**685**	**2.41**	**0.20**
Subtotal	**11134**	**65.76**	**6.07**
Total	**15134**	**89.36**	**8.21**
Percent of Goal	**75.67%**	**85.96%**	**54.26%**

Program Design

Appliance Replacements

In order to meet or exceed EEPG targets, singly or a judicious combination of messaging, best practices of usage, rebates and "buy down" or co-promotions with appliance manufacturers/distributors/retailers will be utilized for various appliances to increase the penetration of these appliance well above prevailing standards. Where appropriate, New Jersey efforts will be coordinated with regional efforts. The program would utilize incentives to pay part of the incremental cost of more expensive energy efficiency equipment and educational programs to inform the public of the benefit of making purchasing decisions on the life cycle cost of the equipment and not just the initial cost. Some 4,000 GWH of electricity and approximately 26 TBtu of heating savings are estimated from this program.

The existing programs that are run by BPU will be transitioned to an approach that relies upon attracting private capital for investment in energy efficiency in a competitive or regulatory manner. Until this transition occurs there will be an expansion and modification of the current Clean Energy Program (CEP) utilizing the next four year Comprehensive Resource Analysis (CRA) setting the annual energy efficiency budget for 2009-2012 as well as the annual budgets with specific performance targets based on the status of the transition. Based on the last six years of experience of the CEP, in order to achieve the above energy savings, the current amount of energy efficiency obtained will need to be increased significantly.

For heating oil appliance replacement there is the possibility that the Fuel Merchants Association will work with the fuel oil distributors to establish a program to assist customers with upgrading to high efficiency units.

Energy Efficiency in Existing Buildings

For existing buildings, other than those covered by the Appliance Replacement Program, a Whole Building approach is recommended. This whole building program will rely on private capital investment in a competitive or regulatory manner. The proposed Whole Building approach would include audits, financing for improvements, implementation of improvements, and performance assessment. The Whole Building approach is proposed to be flexible so that a variety of program designs could be utilized to achieve the desired results. Under the Whole Building concept, discretionary comprehensive energy audits will be performed on residential, commercial, industrial, and governmental premises in targeted areas approved by the BPU to identify, on an integrated basis, cost effective opportunities for EE, DR, CHP and RE. Audited facilities would be provided financing options and encouraged to implement these measures through certified installers.

A key aspect of this approach is that there will need to be a significant increase in workers that are trained to conduct the work associated with this program. This has been termed “all hands on deck” and reflects the need to engage a wide array of companies if we are going to be successful in achieving the energy efficiency targets. While no single entity is suggested herein to deliver the program, it is envisioned that utilities, energy services companies and other contractors would have a significant role in the delivery of the Whole Building improvements. The final mechanism will be the subject of a BPU proceeding.

The BPU is engaging Northeast Energy Efficiency Partnerships (NEEP) to assist in developing a plan during 2008 to achieve EMP energy savings goals for 2020 cost-effectively and expeditiously through a “best in class” portfolio of efficiency strategies for homes, buildings and industries that overcomes market barriers to cost-effective energy efficiency in all customer sectors. NEEP will utilize a team of nationally recognized experts and the project will be guided by input from key stakeholders in New Jersey. The resulting integrated portfolio of ratepayer-funded strategies will include “market driven” programs that capture savings when residents or businesses purchase equipment, build new homes and buildings, renovate or remodel, etc., as well as a comprehensive retrofit strategy for specific market segments. The strategies will address all major fuels and include energy efficiency products and services, combined heat and power, and demand response. They will address whole building solutions and reference and link to state and federal programs that promote building integrated renewable and clean energy generation. The strategies will be designed to leverage resources from market-based interests as well as federal programs (e.g., Energy Star), and will reference existing and potential public policies that can help overcome barriers to reach specific markets. (e.g., through building energy codes, appliance efficiency standards, time of sale requirements, etc.).

Successful passage of pending legislation will be necessary to facilitate local government participation in many energy efficiency and renewable energy opportunities. On January 8, 2008,

Assembly sponsors Chivukula and Rooney introduced A844 a bill to allow certain local public entities to enter into contracts of up to 15 years for provision of renewable energy production at buildings owned by such entities. The bill was referred to Assembly Telecommunications and Utilities Committee and on March 3, 2008, the bill reported out of Assembly Committee with Amendments for 2nd reading in the Assembly. Senator Kean is sponsoring identical bill S299. Passage of this legislation would greatly expand the opportunities for local governments to participate in energy efficiency and renewable energy projects.

Costs to Ratepayers

Preliminary analysis on rate impacts of the overall aggregate energy savings targets in 2010, 2015 and 2020 have been positive and generate bill savings. Between 2001 and 2006, the CEP expended some $496 million on EE and derived a reduction in energy use of some 1200 GWH of electricity and 2.67 TBtu of natural gas. Of the above amount, the CEP expended some $357 million on equipment replacement and derived a reduction in energy use of approximately 865 GWh of electricity and 1.92 TBtu of natural gas.

Savings to Ratepayers

See above.

Affected Sector(s)

Residential, Commercial and Industrial

Administrative Costs

To be determined based on final program design.

Responsible Party

- Board of Public Utilities provides regulatory oversight of the established program(s)

Timeline of Action

- The BPU will consider the next four year funding cycle (2009-2012) for the Clean Energy Program in 2008. A straw proposal was posted by the OCE on the www.njcleanenergy.com website on February 14, 2008. Public hearings on the funding levels and allocation for Clean Energy Programs 2009-2012 are scheduled for April 22nd at BPU Newark offices and May 6, 2008 at 44 S. Clinton Street in Trenton. The funding levels anticipate continuation of the existing program, which would be modified if it is determined that the EE goals will be obtained through another approach. BPU staff is currently working with NEEP and interested parties to develop the most effective and efficient means of achieving the EE goals. NEEP's timeline is to develop a proposal by summer 2008. It is anticipated that recommendations from the process will be presented to the Board in 2008.
- Passage in 2008 of bill A844 sponsored by Assemblymen Chivukula and Rooney and identical bill S299 sponsored by Senator Kean would allow local governments to enter into contracts of up to 15 years for provision of energy efficiency and renewable energy production at buildings owned by such entities.
- With the assistance of NEEP, develop an integrated best in class" portfolio of efficiency strategies for homes, buildings and industries that overcomes market barriers to cost-effective energy efficiency in all customer sectors:
    - Final NEEP report to BPU in summer 2008;
    - BPU action on proposed strategies by the end of 2008.

Source of Funding

- Energy savings from energy efficiency investments and Societal Benefits Charge, Global Warming Solutions Fund monies and utility rate recovery as authorized by the Regional Greenhouse Gas Initiative legislation enacted in P.L. 2007, Chapter 340.

Performance Metrics

- Energy savings by electric utility by sector in GWh
- Energy savings by gas utility by sector in TBtu
- Total cost per kWh saved; per TBtu saved;
- Administrative costs per kWh saved; per TBtu saved.
- MW CHP installed per year
- MW RE installed per year
- MW DR installed per year
- EE jobs created per year Electricity saved by sector per year in GWH
- Natural gas saved by sector per year in TBtu
- Number of efficient appliance replacements by type per year

Enhanced Building Codes

Strategy Description

Establish building codes that would result in a substantial reduction of energy consumption in new buildings compared to buildings constructed under current State Code.

Energy Savings or Energy Production

Adoption of enhanced building codes requiring new construction built in 2020 to use 30% less energy than those constructed today will reduce electric consumption in 2020 by some 1,572 GWh in the residential sector and some 744 GWh in the non residential sector. By 2020, natural gas consumption is expected to be reduced in the order of 4.4 TBtu for the residential sector and 3.49 TBtu for the non residential sector. Heating oil and propane use is expected to be reduced by 1.50 TBtu in the residential sector and .49 TBtu in the non residential sector by 2020.

2020 Energy Efficiency Performance Goals	Electricity GWH	Natural Gas TBTU	Heating Oil TBTU
EMP EE 20% Reduction Goal	**20000**	**103.95**	**15.13**
Enhanced Building Codes			
Residential	**1572**	**4.4**	**1.5**
Commercial	**710**	**3.25**	**0.39**
Industrial	**34**	**0.24**	**0.1**
Total	**2316**	**7.89**	**1.99**
Percent of Goal	**11.58%**	**7.59%**	**13.18%**

Program Design

Buildings account for more than 40% of U.S. energy use and carbon emissions and 65% of total U.S. electricity consumption, making them an important target for energy efficiency policies. Because buildings have long lifetimes, the period of design and construction represents the greatest opportunity to build efficiency into the total building. Decisions made at this time often cannot be remedied later, or can be only at great cost. This heightens the importance of ensuring that energy efficiency is built into the buildings before and during construction. New buildings last decades; therefore they should be subject to much stricter performance standards than exist today.

Building codes are a major reason for the substantial drop in heating and cooling energy use per square foot in residential buildings in recent decades. New building construction standards meeting EPA's ENERGY STAR rating can provide substantial savings. Research and field experience have shown that substantial energy savings are realistically achievable in US homes. Voluntary programs, such as the EPA's ENERGY STAR Homes program (which requires 15% savings relative to minimum energy codes) and USDOE's Building America program (which aims for 50% energy savings), have fostered the construction of more than 100,000 new homes in the country at these advanced levels. State legislation (S2154) has been introduced that will permit the DCA to set building codes that would result in a reduction of energy consumption in new buildings compared to buildings constructed under current State Code. The proposed

legislation requires that any added cost of construction to meet enhanced energy code can be recovered in less than seven years based on energy cost projections supplied by the BPU. Legislation has been introduced by Senator Bob Smith and co-sponsored by Senators Buono, Weinberg and Turner to enhance the State Uniform Construction Code's energy subcode based on anticipated energy savings and to provide down payment assistance to certain purchasers of homes meeting enhanced energy subcode requirements. Assemblypersons McKeon, Chivukula, Prieto, Watson Coleman, and Stender are sponsoring an identical bill A1629 which was initially referred to the Assembly Environment and Solid Waste Committee and on January 28th it was reported and referred to the Assembly Appropriations Committee.

Costs to Consumers

Incremental cost from existing standards for a residential home built to the enhanced energy code requirements is projected at $ 3,673.

Savings to Ratepayers

Energy savings is estimated to be 30% or 3,500 KWh and 435 therms per year per average residential building built to the enhanced energy code requirements from current standards. An average residential building built to the enhanced energy code requirements will use 5000 KWh and 625 therms per year. Using $2,500 as the total energy cost for homes built to the existing code, the savings would be $ 750/year. This represents a simple payback of slightly less than five years.

Affected Sector(s)

Residential, Commercial and Industrial

Administrative Costs

De minimus

Responsible Party

- Department of Community Affairs
- Legislature

Timeline of Action

- Enact enabling legislation S702 by July 2008.
- BPU to provide energy cost projections to DCA by August 2008.
- DCA to adopt implementing rules by July 2009.
- DCA to incorporate new standards in its training program by July 2009.
- DCA to consider additional code changes every three years based on cost projections provided by the BPU.

Source of Funding

- Consumers (the proposed legislation includes support for down payment assistance that would be provided by the Societal Benefits Charge).

Performance Metrics

- Number of homes built to new code.
- Square footage of Commercial and Industrial buildings built per year to new code.
- Survey of new construction to determine usage per square foot to be conducted in 2012.

Appliance Standards

Strategy Description

Set minimum-efficiency standards for appliances and other types of equipment currently not covered by EPAct2005.

Energy Savings or Energy Production

EPAct 2005 Appliance Standards - The standards enacted by Congress (in response to the actions of New Jersey and other states), will result in a reduction in annual energy consumption of almost 1,350 GWh by 2020, equivalent to the energy needed by slightly more than 3.5% of the state's households in 2000. This will result in savings of over $200 million dollars to businesses and consumers through 2020 and total economic benefits of $2 billion. By 2020, enacting the proposed energy efficiency standards will shave roughly 370 MW of peak demand, equivalent to the demand of roughly 350,000 households and 1.5% of the State's projected electrical peak load of 25,000 MW. By 2020, the standards will provide annual natural gas savings of some 3 Trillion Btus.

Date	Electricity (GWh)	Electricity Cumulative (GWh)	Electricity Peak Load Reduction (MW)	Natural Gas (TBtu)	Natural Gas Cumulative (TBtu)	Heating Oil & Propane (TBtu)	Heating Oil & Propane Cumulative (TBtu)
2009-2010	0		0	0		0	
2011-2015	675	675	185	1.5	1.5	0	0
2016-2020	675	1350	370	1.5	3.0	0	0

Future Standards for Appliances not covered by EPAct2005

Raising standards for the appliances listed below will reduce annual energy consumption by almost 1,200 GWh by 2020 resulting in savings of over $219 million dollars to businesses and consumers in 2020. By 2020, enacting the proposed energy efficiency standards will shave roughly 270 MW of peak demand, equivalent to the demand of roughly 270,000 households and 1.1% of the State's projected electricity peak load. By 2020, the future standards will provide annual natural gas savings of 3.7 Trillion Btus and heating oil savings of 0.57 Trillion Btus.

Date	Electricity (GWh)	Electricity Cumulative (GWh)	Electricity Peak Load Reduction (MW	Natural Gas (TBtu)	Natural Gas Cumulative (TBtu)	Heating Oil & Propane (TBtu)	Heating Oil & Propane Cumulative (TBtu)
2009-2010	0			0		0	
2011-2015	600	600	135	1.5	1.5	0.23	0.23
2016-2020	600	1200	270	2.2	3.7	0.34	.57

Program Design

As of 2005, with the adoption of the EPAct2005, federal statutes over the years have established and/or have required the USDOE to establish standards for the following appliances or equipment:

Residential Products

- Battery Chargers and External Power Supplies
- Central Air Conditioners & Heat Pumps
- Clothes Dryers
- Clothes Washers
- Cooking Products
- Dehumidifiers
- Dishwashers
- Furnaces and Boilers
- Fluorescent & Incandescent Lamps
- Fluorescent Lamp Ballasts
- Plumbing Products
- Pool Heaters
- Refrigerators & Freezers
- Room Air-conditioners
- Small Duct, High Velocity Air Conditioners
- Torchieres
- Water Heaters

Commercial Equipment

- Clothes Washers
- Distribution Transformers
- Electric Motors
- Furnaces & Boilers
- High Intensity Discharge Lamps
- Refrigerated Beverage Vending Machines
- Refrigeration Equipment
- Small Electric Motors
- Unitary Air Conditioners and Heat Pumps
- Water Heaters

The American Council for an Energy-Efficient Economy (ACEEE) has identified opportunities for state governments and the federal government to set minimum-efficiency standards for appliances and other types of equipment currently not covered by EPAct2005. These are:

- Bottle-type water dispensers
- Commercial hot food holding cabinets
- Compact audio products
- DVD players and recorders
- Metal halide lamp fixtures
- Portable electric spas (hot tubs)
- Residential furnaces and boilers
- Residential pool pumps
- Single-voltage external AC to DC power supplies
- State-regulated incandescent reflector lamps
- Walk-in refrigerators and freezers

On March 13, 2008, the Assembly passed amended Appliance Standard legislation A1763 sponsored by Assemblywomen Coleman and Greenstein. The amended bill requires the BPU and the Commissioner of Community Affairs to establish minimum energy efficiency standards for the above-listed new products sold, offered for sale, or installed in the State: Senator Kean introduced identical bill S1253 on February 21st, which was referred to Senate Economic Growth Committee.

Costs to Consumers

- **EPAct2005 Appliance Standards:** $253 average incremental cost increase. Products range from personal electronics ($5) to large packaged (>20 ton) AC units ($1,999).
- **Future Standards for Appliances not covered by EPAct2005:** $179 average incremental cost increase. Products range from single-voltage external AC to DC power supplies ($0.49) to walk in refrigerators ($957).
- **Incremental cost of products**: Simple payback of less than 2.8 years.

Savings to Ratepayers

Under **EPAct2005 Appliance Standards**, for every dollar spent on increased appliance efficiency, the ratepayer will save between $2 and $10 in energy costs. This will result in savings of over $200 million dollars to businesses and consumers through 2020 and total economic benefits of $2 billion.

Savings under **Future Standards for Appliances not covered by EPAct2005** is projected to be over $219 million dollars to businesses and consumers in 2020.

These savings will boost the economy as consumers find themselves with more disposable income to spend. Standards particularly benefit low income consumers who generally spend a higher percentage of their income on electricity bills.

Affected Sector(s)

Residential, Commercial and Industrial

Administrative Costs

Developing standards: between zero and $70,000.
Cost to establish compliance and enforcement program: to be determined.

Responsible Party

- Board of Public Utilities
- Department of Community Affairs

Timeline of Action

- Enact enabling legislation as provided for in A1763 and S1253 by October 2008.
- BPU to work with other states to join in a multi-state certification system by December 2008.
- BPU in consultation with DCA to adopt rules on: (1) Appliance Efficiency, (2) Certification and, (3) Testing Standards by October 2009.
- BPU to develop a program that will provide a process for self certification and testing of appliances in case future standards are adopted by October 2009.
- BPU to develop a program to conduct periodic saturation surveys or develop other alternative program to gauge the effectiveness of the program and measure the energy savings realized by the new efficiency standards by October 2009.

Source of Funding

- Manufacturers and Consumers: for purchasing appliances.
- BPU assessment: for implementation monitoring.

Performance Metrics

- Number of covered appliance sold per year.
- Level of compliance.

Best Practices Manuals and Energy Audits For 10 Industry Groups

Strategy Description

Based on recommendations from the NJ Business & Industry Association, a total of 10 industry groups (e.g., supermarkets, restaurants, hospitals, etc.) will be identified for a program to create Best Practices manuals featuring recommendations for energy efficiency improvements that are applicable to all businesses within that group. The manuals will be developed from the results of energy audits conducted at representative businesses within each group.

Energy Savings or Energy Production

Energy savings to be determined; no additional energy production anticipated.

Program Design

Once the 10 industry groups are identified, representative members of each group will be selected to have an energy audit performed at their facility. Best practices will be developed for each group as a result of those audits. A manual will then be published for each industry group and distributed to its members.

Costs to Ratepayers

Approximately $150,000.

Savings to Ratepayers

Not quantifiable at this time, although energy efficiency gains made in 10 major commercial or industrial sectors may accrue to the benefit of all ratepayers in terms of lower system costs.

Affected Sector(s)

Commercial and Industrial customers within the 10 industry groups selected.

Administrative Costs

Program costs estimated to be approximately $150,000. Expenses will include the audits themselves and the publication and distribution of the manuals.

Responsible Party

- The BPU's Office of the Business Energy Ombudsperson will oversee the administration of the program. Outside contractors will be selected by the OBEO to perform the audits and publish the manuals.

Timeline of Action

- Audits should commence in 2008, with manuals published as audits are completed. All manuals should be published and distributed by mid-2009.

Source of Funding

Existing funds in the Retail Margin Account.

Performance Metrics

- Completion of audits
- Publication/distribution of manuals by deadlines set forth above.

Education and Public Outreach

Strategy Description

Advance the education goals of the EMP by establishing an Energy Education Joint Venture Partnership (EEJVP) comprised of representatives from these sectors: utility organizations, business groups, environmentalists, academia, county/municipal governments, K-12 educators, consumer advocacy groups, and state government.

Their task would be to review existing education efforts in public and private sectors, and recommend an ongoing mix of public and private education programs and resources to achieve the EMP goals.

Energy Savings or Energy Production

N/A

Program Design

Subsequent to the adoption of the Final EMP, an EEJVP Group will be formed and directed to formulate, within one year, a report on existing education efforts, in both the private and public sectors of New Jersey that effectively help EMP target audiences adopt behaviors that save energy.

The existing Community Partners program will be evaluated as part of this effort. In addition, the Board of Public Utilities is addressing the account lookup issue that is believed to have slowed enrollment in the Clean Power Choice Program. After the account lookup issue is resolved, the number of new enrollees will be monitored to determine program success. The group will be tasked also with proposing any new education programs or public private partnerships that would effectively promote awareness of New Jersey's energy challenges and lead to "green" behaviors.

Costs to Ratepayers

The funding source would be the Societal Benefits Charge. The direct costs to the ratepayer would be negligible based on estimated administrative costs (staff organizing time as well as additional administrative costs) of $10,000.

Savings to Ratepayers

To the extent that energy efficiency goals and innovations in energy governance are achieved, this would realize savings benefits to the ratepayer albeit indirect. Areas of saving:

- Household and business energy expenditures;
- Expenditures on vehicle fleet, lighting and other resources in State government;
- Beginning the process of educating the next generation of New Jerseyans about energy issues via K-12 programs that will help the state meet its 2020 EE and 2050 GHG goals. Children in the fourth grade now will be college graduates in 2020.
- Inspiring current college-level students to choose green careers and become energy champions.

Affected Sector(s)

- Residential, Commercial and Industrial
- State and local government

Administrative Costs

- $10,000

Responsible Party

Energy Master Plan Committee members

Timeline of Action

Prior to adopting the Final EMP:

- Agencies formulate recommendations for the appointments to the Energy Education Joint Venture Partnership (EEJVP).
- Within six months of adoption of the Final EMP, EEJPV is formed and begins meeting regularly to craft a report and recommendations.
- Within one year of creation of EEJVP, a final report will be submitted to the Governor's Office and EMP Committee.

Source of Funding

- Societal Benefits Charge

Performance Metrics

- Timely completion of assigned task.

Decrease Size of Customers in Real-time Pricing

Strategy Description

This strategy will gradually extend real-time (i.e., hourly) electric pricing to greater numbers of commercial and industrial customers as a way to curb peak demand through appropriate pricing signals. By requiring more large energy users to pay rates that accurately reflect the true cost of producing electricity at the time they are using it, the costs imposed on the system are more equitably allocated to those customers who are responsible for them. This strategy will also serve as an economic incentive to shift demand to off-peak periods, thus making more efficient use of the power grid.

Energy Savings or Energy Production

Modeling is necessary to quantify the megawatt hours that will be saved over time by using economic incentives to reduce consumption during peak periods. However, by shifting demand from peak to off-peak periods, less efficient and costlier generating plants are used less frequently, reducing overall system costs for all customers. Some incremental energy production may occur if customers install on-site generation to assist them in reducing their demand from the grid.

Program Design

Currently, only the largest commercial and industrial customers (those with peak load shares of 1,000 kW or above) are required to use real-time, or hourly, pricing. This means that they pay a price per kWh that accurately reflects the cost of generating that kWh during a particular time on a particular day. This form of pricing provides an economic incentive to shift usage to lower-cost, off peak periods. By gradually reducing the threshold for eligibility, a greater portion of the state's electricity demand will become subject to a pricing structure that more accurately reflects the true cost of generating the electric supplies that are used at the time they are used. The

Costs to Ratepayers

The costs to the ratepayers that are impacted by this strategy will vary according to their ability to shift their demand to off-peak periods. Ratepayers who are unwilling or unable to shift their demand will experience higher electric costs. However, these cost increases may be able to be offset by implementing energy efficiency measures. BPU's Office of the Business Energy Ombudsperson will focus on providing assistance for those businesses that are anticipated to be negatively impacted by a shift to hourly pricing. The Office monitors the effect of hourly pricing on commercial and industrial customers and is currently studying the economic impact and energy policy objectives of hourly pricing on the customers with peak load share of 1,000 to 1,250 kilowatts.

Savings to Ratepayers

There is a potential for significant savings to ratepayers who can reduce their demand during peak periods through efficiency, operational modifications or load shifting.

Affected Sector(s)

Commercial and industrial customers with peak load shares currently greater than 1,000 kW (except for the smallest commercial customers) are affected. If the Board lowers this threshold additional customers will be affected.

Administrative Costs

Interval meters have already been installed by the utilities for customers with peak load shares of 750 kW and above. For full strategy implementation, these meters (which cost range $200-$400 each) would have to be installed on all other commercial accounts, except for the smallest.

Responsible Party

- New Jersey's four Electric Distribution Companies (EDCs) would be responsible for the appropriate meter installation, meter reading and billing. The EDCs would be required to provide the affected customers with real-time usage and pricing information free of charge. The BPU would oversee the EDCs' actions.

Timeline of Action

- The Board will consider lowering the threshold for hourly pricing to 600 kW by 2010; lowering to 500 kW will be considered by 2012; and lowering to include all but the smallest commercial accounts will be considered (at a peak load share to be determined) by 2020. In addition, if the threshold is lowered to 750 kW or below, the BPU will consider eliminating the retail adder currently payable by these customers who buy electric supplies from their EDCs by 2010.

Source of Funding

- The EDCs would bear the cost of implementing this strategy, and would be allowed rate recovery for appropriate expenses.

Performance Metrics

- To be determined.

Demand Response Programs

Strategy Description

Implement statewide demand response (DR) programs to increase peak as well as annual energy savings through a variety of programs including greater participation for all customer classes in existing PJM economic and emergency demand response programs.

Energy Savings or Energy Production

Program savings targets according to customer usage profiles will be identified as programs are developed.

Program Design

The Board of Public Utilities will work with stakeholders to identify the need for DR incentive programs according to customer peak usage and will develop programs as appropriate. Demand response programs will be considered for three categories of customers: (1) large commercial and industrial (C&I) customers with a peak load share greater than 1,000 kW; (2) customers with a peak load share from 500 kW to 1,000 kW and (3) customers with peak load share below 500 kW. First, BPU Staff will evaluate current levels of participation in PJM programs among large C&I customers and make recommendations to the Board on whether additional incentives are needed to increase participation to help meet EMP goals. Examination of DR programs and opportunities for the remaining tiers of customers will occur as the BPU contracts with the New England Energy Partnerships (NEEP) to assess energy efficiency, demand response and renewable energy opportunities and cost-effective investments for New Jersey

Costs to Ratepayers

Costs will be determined as specific programs are developed.

Savings to Ratepayers

To be determined, based on energy savings both during peak times and on an annual basis.

Affected Sector(s)

Residential, Commercial and Industrial.

Administrative Costs

To be determined.

Responsible Party

- The New Jersey BPU will review and oversee DR programs.

Timeline of Action

- BPU evaluation of large C&I participation in PJM programs and assessment of whether additional incentives are needed to be completed autumn 2008.
- Initial recommendations for DR programs targeting customers with peak shares of 1,000 kW and below to be presented in NEEP report by summer 2008.
- Any DR programs for BGS would require Board approval prior to October 2008 in order to be ready for inclusion in the March 2009 RPM auction at PJM.

Source of Funding

- Depending on specific program design, funding sources may include Societal Benefits Charge, RGGI, BGS and private funding.

Performance Metrics

- To be included as part of the filings with the Board. Any program that leverages or is based is based on existing PJM programs would utilize PJM's Measurement & Verification protocol.

Load Management Program for Large Commercial and Industrial Customers

Strategy Description

Implement a voluntary load management program for large commercial and industrial customers, operated by the state's utilities, to shave peak demand during periods of high electricity prices, in order to reduce zonal wholesale electricity prices; to curtail load during system emergencies in order to avoid voltage reductions or blackouts; and to receive a revenue stream by participating in PJM demand response economic and emergency programs and market-based opportunities. The demand response could be achieved through direct load control by the utilities through the cycling of central air conditioner compressors or temperature offsets with the use of programmable thermostats; dimming lighting fixtures; or by cycling or curtailing other equipment individually designated by the large customer. In addition, the large customers could take other action to drop load upon receiving a signal from their utility. The demand response would be enrolled in the PJM Demand Side Resource Programs and/or bid into the energy markets, according to the PJM Business Rules.

Energy Savings or Energy Production

This would be determined by the size and scope of the program; the number and size of the participating facilities; the choice of curtailment strategies and the efficiency factor of the equipment; and the resultant amount and level of demand reduction from each participating facility.

Program Design

To be determined with the collaboration of the utilities, Rate Counsel, industry experts, commercial and industrial representatives, and other interested parties, as to what would be most cost-effective and advantageous to the large energy users. The program should be consistent with the PJM Business Rules regarding participation in the economic and emergency demand resource programs and market opportunities.

Costs to Ratepayers

There would be no cross-subsidies by other customer classes. There might be an intra-class subsidy from other large and industrial customers, who do not choose to participate in the program. This would be decided by the Board when it designates a funding source.

Savings to Ratepayers

The cost savings to each participating facility would vary, according to its level of energy reduction. In addition to the individual savings, the benefits to all consumers in New Jersey could be significant, if the program is effective in lowering the wholesale energy market prices during peak times, reducing capacity and congestion costs, and deferring or avoiding the need for new infrastructure.

Affected Sector(s)

The large commercial and industrial customers who can directly benefit from participating in the program. The positive societal impacts would affect all customers statewide.

Administrative Costs

To be determined, through the stakeholder development process.

Responsible Party

- The state's utilities, with oversight by the BPU. The utilities could partner or subcontract with one or more curtailment service provider, or other industry specialists, in developing, implementing and operating the program.

Timeline of Action

- To be determined, in collaboration with the utilities, and through the stakeholder development process.

Source of Funding

- To be determined by the Board, but potential sources could be the retail margin fund, a portion of the societal benefits charge (SBC) or utility rate recovery as authorized by P.L. 2007, Chapter 340 (the RGGI Act).

Performance Metrics

To be determined by the stakeholder process, but could include, but not be limited to:

- Number of participating facilities;
- Level of peak demand reduction;
- Amount of energy saved;
- Monetary savings to participating companies;
- Participants' satisfaction level;
- Number of drop-outs and participant complaints;
- Impact on wholesale electricity prices at peak times;
- Impact on prices in the reliability pricing model (RPM) capacity market auctions;
- Cost-effective methodology analysis comparing costs to benefits; and
- Impact on New Jersey's BGS procurement process.

Block Tariff Pricing

Strategy Description

Energy Conservation Incentive Block Structure may be a more cost effective means as opposed to an Advanced Metering Initiative (AMI) approach to encourage residential customers to reduce their peak or yearly overall usage depending upon the final structure of the program. Rather than the use of expensive high tech AMI metering and communication equipment, customers will have an opportunity of paying lower blocked BGS rates if they participate in either an A/C cycling program that uses less costly thermostat equipment that is controlled by either the utility or a third party during the summer or other renewable/energy efficiency programs during the entire year or one of the Board's renewable energy and/or energy efficiency programs. This incentive block structure will be considered for customers with demand of less than 600kW.

Energy Savings or Energy Production

This will be discussed through a stakeholder process. It will depend upon the type of program that is ultimately available. Customers who move off of higher blocked BGS rates if they participate in A/C cycling, may see anywhere from .27 to 1.33 kW per hour savings as reflected in the final report for PSE&G's myPower Link pilot program. Customers may experience significantly more or less savings depending upon the design of the program and the blocked rates and whether customers participate in one of the Board's renewable and/or energy efficiency programs as opposed to A/C Cycling. Until the details of the program are known, we cannot calculate an accurate level of savings.

Program Design

The program details will be determined through a stakeholder process. However, the current inclining rate block structure could include a third and/or fourth block or be simply redesigned so that the existing block sizes are reduced by 20% thus, encouraging customers to reduce their usage in each block by 20% or more so that they can fall into this new block structure and consequently reduce their bills. Customers would fall under this new block structure by either participating in A/C Cycling or a renewable/energy efficiency program. The details of either approach or an alternative approach and the level of reasonable customer reductions will be part of the discussion at the stakeholder meetings.

Costs to Ratepayers

Cost will depend upon program design and discussions with stakeholders, specifically with the utilities and vendors that are chosen for these programs.

Savings to Ratepayers

It will depend upon their reduced consumption which will be dependent upon which program they sign up for: A/C Cycling, Renewable/Energy Efficiency.

Affected Sector(s)

Residential and small commercial sectors.

Administrative Costs

To be determined as specific program design is developed through the stakeholder process.

Responsible Party

- BPU, Rate Counsel and stakeholders to develop a program for Board consideration.

- If approved by the Board of Public Utilities, utilities would be responsible for managing this program.

Timeline of Action

- BPU Staff will commence a stakeholder process with Rate Counsel, BPU Staff, utilities and customer groups in 2008 to develop a workable, reasonable, cost effective and prudent and equitable program.
- Recommendations will be considered by the Board in the first quarter of 2009.

Source of Funding

- To be discussed at the stakeholder meetings. One possible source would be from the sharing of quantified utility cost savings resulting from load reductions.

Performance Metrics

- This will be discussed at the stakeholder meetings. However, the performance metrics will be those calculated under each energy efficiency/renewable energy/ A/C Cycling program in which the customer chooses to participate in order to receive a more favorable BGS rate design. Moreover, customers will simply stay on the favorable rate design if they just participate in any of these programs.

A Pilot for Testing Components of a "Smart Grid"

Strategy Description

Working with stakeholders, design and implement a proof-of-concept pilot(s) for a "smart grid" electricity network, within specific areas of one or more utility jurisdictions. The pilot(s) would test the installation and operation of integrated equipment, possibly a supporting tariff design, and other related components to support "smart" electricity delivery for overall greater system efficiency and reliability. The pilot(s) would incorporate design(s) for such a "smart" system; identify specific necessary components and integration features; and test the capability of network technology to automatically detect and react to distribution and transmission system failures, emergencies, and delivery congestion, and reduce electricity line losses. The pilot(s) design could include Advanced Metering Infrastructure (AMI), as a component of a "smart grid". The utilization of appropriately sited clean distributed generation and micro grids could also be investigated as part of a "smart" electricity network. The pilot(s) should reflect the ongoing "Smart Grid" vision, which is under development in various national and regional forums.

Energy Savings or Energy Production

To be determined: based on the number of pilots, design features, project(s) scale(s), selected equipment, devices and other necessary components, as well as the role of customers in the pilot(s).

Program Design

The pilot(s) should provide an integrated, systemic approach to upgrading portions of the existing electric delivery system based on commercially available "smart" technology. Such "smart" technology should rely on open architecture principles that allow interoperability of system components, rather than reliance on proprietary equipment, with supporting functional, communication and technical standards that are consistent with a national, or at minimum, regional "Smart Grid" vision. The pilot(s) should identify the specific technological components necessary to support the development of a "smart" electricity grid, including but not limited to "smart" chips on transformers and other equipment and infrastructure; communication hardware and software, standards and processes; metering, such as AMI; and any other element that furthers "smart" electricity delivery. Communication standards, such as ZigBee, ASHRAE, and other applicable national or international standards should be considered. Pilot(s) should be located in areas that routinely experience electricity delivery congestion, high Locational Marginal Prices (LMPs), and/or high electricity line losses, for maximum benefits to the system.

Pilot(s) should specifically address the design(s) interrelationship with the Basic Generation Service (BGS) procurement process. Special consideration should be given to reducing annual and peak usage to change the load curve in a manner that could lower electricity costs for all ratepayers.

Any proposed tariff designs, which would encourage greater energy conservation by charging higher rates for greater usage, especially at times of peak demand, or lower rates for participants in the state's Air Conditioner Cycling Programs, could potentially include all customer classes. The pilot(s) could also utilize appropriately sited clean distributed generation, energy efficiency and load shifting technology, as well as micro grids consistent with the emerging "Smart Grid" vision.

In addition, the pilot(s) could test a variety of control devices, communication equipment, and educational material to identify what would be most helpful and beneficial to customers to see and to respond to high electricity price signals, as part of the "smart" distribution concept, by controlling or managing energy use during high-price hours. Such technology should include the opportunities provided by Internet usage.

The specific criteria and pilot(s) design(s) could be developed in a collaborative process, organized and managed by one or more utilities, including interested stakeholders, with oversight by BPU staff. Parties could include PJM Interconnection, curtailment service providers (CSPs), third party energy suppliers, Rate Counsel, consumer organizations, environmental groups, equipment vendors, and any other interested member of the public. A working group could help identify parameters for pilot design(s); the strategies, technology and any customer educational materials to be tested; and the administration of the pilot(s). Consultation with independent national experts, such as the U.S. Department of Energy (DOE), Lawrence Berkeley National Laboratory (LBNL), and other such entities working on a "Smart Grid" vision, could be helpful. It is expected that the utility(s) would engage in a competitive process to obtain needed technology and services to ensure that the pilot(s) are cost-effective.

If more than one pilot is implemented, careful coordination should ensure that the pilot designs are not entirely duplicative, although there could be overlap in certain beneficial technology, including communication standards. Any customer participation in the pilot(s) should be voluntary, if the role of the customer includes a change in tariff design(s). The pilot(s) could test a variety of automatic control equipment, as part of electricity delivery, including equipment at the customer site. Such equipment could include, but not be limited to, appliance sensors, chips and controls, programmable thermostats, energy monitoring, metering, communication devices and any other technological support, as well as educational material and any assistance that customers would need to benefit from the pilot(s).

Costs to Ratepayers

To be identified by the pilot(s), but a primary consideration should be cost-effectiveness of the pilot(s) in terms of potential benefits.

Savings to Ratepayers

To be identified by the pilot(s) and accomplished, in part, through greater overall electricity distribution efficiency, reliability, load management and cost-effectiveness affecting all ratepayers, in addition to potential participants' bill savings and anticipated future savings through reduced LMP prices during high peak periods.

Affected Sector(s)

Utilities and all customer classes would be affected.

Administrative Costs

To be determined, based on pilot(s) scope(s) and design(s), and on results from any Request for Proposal (RFP) submissions.

Responsible Party

One or more of the state's utilities would be responsible for the pilot(s), with oversight from the Board of Public Utilities and input from the Ratepayer Advocate.

Timeline of Action

Proposed timeline of action: The collaborative working group could be charged with assistance in the development of such a timeline, based on the experience of market participants. The

timeline could be affected by the utility(s)' competitive procurement processes; the recommendations of the collaborative working group; industry responses to the utility(s) RFP(s); and the availability of necessary technology. Any timeline should include periodic reporting requirements, to allow monitoring by the BPU, Rate Counsel, and any other appropriate parties. If the pilot(s) are not performing as planned, for any reason, opportunity should be built into the process to allow revisions or discontinuation of specific components of the pilot(s).

Source of Funding

The state's utilities, in their ordinary course of business, can undertake pilots at any time to improve the reliability of their infrastructure and to increase operational efficiency. The utilities could then pursue cost recovery under prudency reviews in a public process.

Performance Metrics

- Greater reliability of the distribution system in one or more utility jurisdiction(s).
- Ability of the distribution system to automatically react to, address, reroute or "self-heal", in response to wire congestion or overloading conditions, voltaic changes, transformer or other equipment failure, and other system emergencies.
- Reduction in line losses in the pilot(s) geographic areas.
- Lower number of electricity outages, brownouts and other emergency conditions that directly affect customers.
- More rapid and accurate detection and response to system outages and other system emergency conditions that could not be avoided or prevented.
- Lower number of truck roll-outs needed to respond to emergency conditions.
- Impact on participants' bills on a monthly and annual basis, if specific customers have a defined role in the pilot(s).
- Impact on participants' energy use and consumption on a monthly and annual basis, if specific customers have a defined role in the pilot(s).
- Participants' levels of satisfaction with the pilot(s), if specific customers have a defined role in the pilot(s).
- Number of drop-outs, length of participation, methods to maintain adequate level of volunteers, if specific customers have a defined role in the pilot(s).
- Technology evaluation, including how well equipment, hardware, software, and protocols worked under system congestion and emergency conditions; failure rates; costs to rectify problems; lifespan of new technology; and level of interoperability with the existing distribution system(s).
- Educational material and customer support evaluation, if part of the pilot(s).
- Pilot(s) costs by category for administration, technology, equipment and operations, installation and repair, ongoing data communication, education and any other functions.
- Impact on LMPs in the pilot(s) zone(s) during peak times.
- Overall comparison of pilot(s) costs to savings and benefits.
- Other performance metrics, as identified by the collaborative working group.

Solar Transition

Strategy Description

Shift to a financing system that is based on the sale of solar renewable energy certificates (SRECs) and reduced rebates through 2012 rather than the current rebate (paying approximately 50% of the cost) and SREC approach. The financing system will include an eight-year Solar Alternative Compliance Payment (SACP) schedule.

Energy Savings or Energy Production

The Renewable Portfolio Standard requires an increasing amount of solar electricity in each energy year, for energy year 2009 it is 0.16% and for energy year 2021 it is 2.12%. Assuming implementation of the energy efficiency and combined heat and power programs, approximately 1.5 million MWh would be produced in energy year 2021.

Program Design

The Board of Public Utilities has issued a Board Order dated December 6, 2007 that specifies the decisions made concerning the solar transition and the actions that need to be taken to implement those decisions. A pilot program utilizing the SREC financing system will continue until regulations are adopted to fully implement the Board Order. In addition, the Clean Energy Program (CEP) financing needs for 2009-2012 will include funding for solar rebates for smaller systems. This will provide time to develop regulations that will allow the development of community based systems. Community based systems could allow residential and small commercial customers to take advantage of the economies of scale in building larger solar projects by connecting to a single system that would be designed to meet all or part of the cumulative load of the participating customers. This approach would eliminate the need for rebates for smaller systems after 2012 and is likely to reduce the incentives needed to support solar development.

On April 8, 2008, the Board approved a settlement stipulation allowing PSE&G to implement a solar photovoltaic (PV) program across all customer classes within its electric service territory, with segments for residential, residential low-income, municipal/public entities, and commercial/industrial (C&I) and not-for-profit customers. PSE&G will accept solar project applications over the next two years on a first-come, first-served basis to finance up to 30MW of solar installations with approximately $100 million in loans. The projects would satisfy approximately half of the Renewable Portfolio Standard (RPS) requirements for load served in the PSE&G service territory during the energy years 2009 and 2010.

Costs to Ratepayers

The Board Order includes a recommendation to put in place a cost cap of two percent of the estimated cost of solar incentives compared to the estimated retail cost of electricity in a given energy year. Regulations will codify this recommendation.

Savings to Ratepayers

Solar electricity is clean and a form of distributed generation. While solar electricity is not cost competitive with other forms of electricity, continued improvements in this technology could lead to further reductions in cost. If cost parity can be achieved solar electricity would provide ratepayers with a means to mitigate the increase in cost of electricity from conventional sources.

Affected Sector(s)

Residential, Commercial and Industrial

Administrative Costs

The costs of administering the SREC financing system will be significantly lower than the current rebate system. Estimated administrative costs will be developed in the Clean Energy Program annual budget for 2009.

Responsible Party

- BPU Office of Clean Energy

Timeline of Action

- Propose regulations for implementation of SREC financing system by May 2008 with adoption by March 2009. Draft regulations were released January 11, 2008 for stakeholder review and comment. Meetings to discuss the proposed regulations will be held statewide prior to the Board's consideration of the draft rues in May 2008.
- Adoption of SREC final rules is anticipated to occur by the end of 2008.
- PSE&G pilot solar program will be implemented between April 2008 and April 2010.

Source of Funding

- Societal Benefits Charge, electricity rates and utility rate recovery by PSE&G pilot as authorized by P.L. 2007, Chapter 340 (the "RGGI Act).

Performance Metrics

- Amount of solar electricity generated in each energy year;
- Percentage of solar electricity generated compared to total retail electricity sold in NJ compared to RPS requirement;
- Cost of rebates provided to solar systems in each energy year;
- Cost of SRECs in each energy year;
- Cost of SACPs in each energy year;
- Cost of solar incentives compared to retail cost of electricity.

Offshore Wind

Strategy Description

Development of an offshore wind pilot project, up to 350 MW and the eventual development of 1000 MW, if determined to be feasible based on ongoing studies.

Energy Savings or Energy Production

The pilot project would produce up to 350 MW of renewable energy. A solicitation for projects has been issued by the BPU; therefore, it is unclear what level of energy production the final pilot will contain. If the full 350 MW is built it is anticipated that approximately 1,000 GWh of electricity would be generated per year. If 1000 MW is built the total electricity produced per year would be almost 2,800 GWh.

Program Design

BPU's solicitation provides an incentive to encourage the development of offshore wind projects serving the electricity distribution system in New Jersey. The objective of the pilot is to gain and document experience constructing and operating offshore wind energy projects in New Jersey. The project will be coordinated with DEP's Baseline Ecological Study and will only commence operation if and when all applicable permits are obtained.

Five proposals were submitted in March 2008 in response to the solicitation. They will be reviewed by a multi-agency evaluation committee established by the BPU. The committee will submit its recommendations to the Board.

Costs to Ratepayers

BPU will provide $19 million in funding, available through the New Jersey Economic Development Authority. These funds are being collected through the Societal Benefits Charge.

Savings to Ratepayers

The electricity produced will likely be used to meet the RPS requirement for Class 1 renewables. If offshore wind can compete with other renewable sources it can put downward pressure on Renewable Energy Certificate prices that are purchased to meet the Renewable Portfolio Standard.

Affected Sector(s)

Residential, Commercial and Industrial affected due to the SBC charge.

Administrative Costs

Staff costs are included in the 2007 and 2008 Clean Energy Program budgets.

Responsible Party

For the solicitation of the pilot project: NJEDA and BPU.

Timeline of Action

- The solicitation for the pilot project is expected to result in a selected project or projects in summer 2008. A determination whether to issue an additional solicitation or begin accepting permit applications for other offshore wind projects will be made after DEP's Baseline Ecological Study is complete, anticipated to be in mid-late 2009.

Source of Funding

- The Clean Energy Program 2008 budget includes $19 million in Societal Benefits Charge funds for the solicitation of the pilot project.

Performance Metrics

- Number of MWs of offshore wind;
- MWhs of electricity produced by offshore wind facilities;
- MWhs of electricity produced by offshore wind facilities during peak periods.

On-shore Wind

Strategy Description

Develop an onshore wind market that delivers installed capacity of up to 200 MW by 2020.

Energy Savings or Energy Production

The potential market for wind energy systems located onshore in New Jersey is estimated to be as large as 200 MW of renewable energy capacity. This estimate, based upon the Navigant renewable energy market characterization, assumes the necessary funding mechanisms are in place through CEP budgets, and Renewable Portfolio Standard Class I percentage requirements are adjusted to include NJ-based wind in a carve-out similar to solar. It is estimated that 200 MW of installed wind capacity would produce over 500 GWh of electricity per year.

Program Design

Following the directives provided in the Electric Discount and Energy Competition Act of 1999, the BPU currently administers three sources of subsidy which make wind energy systems a cost effective investment for New Jersey ratepayers; New Jersey's Clean Energy Program funded through the Societal Benefits Charge, the Net Metering and Interconnection Rules at *N.J.A.C.* 14:4-9, and the Renewable Portfolio Standard at *N.J.A.C.* 14:8-2.

New Jersey's Clean Energy Program Wind System Incentives

The Customer Onsite Renewable Energy (CORE) rebate program continues to provide rebates for ratepayer investment in wind energy systems less than 1 MW in size. Staff is working with the renewable energy market manager and stakeholders toward making the rebate performance based rather than simply based upon system rated capacity. This is expected to result in a more robust investment of ratepayer funds. The Renewable Energy Project Grants and Finance Program and its predecessor programs have provided subsidy for systems larger than 1 MW. A Renewable Energy Market Assessment is nearing completion which is expected to make this grant program more reflective of the needs of large scale wind projects.

Net Metering and Interconnection

Existing Net Metering and Interconnection standards at *N.J.A.C.* 14:4-9 currently enable customer sited generators to interconnect to the local distribution system serving New Jersey and net meter. The generators are limited in size to providing no more than the annual energy consumption at the electric meter or 2 MW AC whichever is less. Allowing ratepayers with multiple accounts to aggregate their consumptive load to enable installation of system sizes larger than the load at any single meter is being considered. Recently enacted legislation expands the rate classes eligible for net metering and incorporates time-of-use tariffs in net metering processes. Changes to the net metering rules will be implemented by the BPU through a stakeholder proceeding scheduled to commence this spring to accommodate legislative changes in net metering signed by the Governor in January 2008 from Senate Bill 2936 and Assembly Bill 4554.

Renewable Portfolio Standards

Existing Renewable Portfolio Standards at *N.J.A.C.* 14:8-2 currently treat the RECs from all Class I RE facilities throughout PJM the same economically regardless of geographic location within PJM or physical location such as customer sited or grid supplied. An RPS carve-out for customer-sited wind similar to the RPS treatment of customer-sited solar will be considered.

Supporting the NJ Small Wind Working Group
The Office of Clean Energy (OCE) has organized the New Jersey Small Wind Working Group (NJSWWG). NJSWWG's work plan is designed to help promote terrestrial applications of small wind energy systems throughout the State. The NJSWWG is developing a state-wide implementation strategy to stimulate wind development.

Supporting Small and Community Scale Wind Outreach
The OCE with the NJSWWG has developed a Small Wind Model Ordinance to use in a targeted fashion in municipalities with good wind resources preferably along the coastal areas, to promote wind energy systems and to educate government officials including local zoning officials, residential and commercial customers about the benefits of this renewable resource.

Supporting Agriculture Outreach initiatives including town meetings, section 9006 Farm Bill workshops, key stakeholder briefings, and attendance at top agriculture events.
OCE will participate at key events with the United States Department of Agriculture (USDA), Rural Development Office and attend USDA Farm Bill section 9006 workshops and seminars in order to promote the leveraging of CEP incentives toward the use of Small Wind Energy Systems in rural farm areas that are likely to have viable wind resources.

Supporting Anemometer Loan Program
The OCE will subcontract with State Colleges to administer the NJ Anemometer Program. The purpose of the program is to enlist the assistance of NJ universities and colleges in building NJ's capacity for providing wind resource assessment services through:

1. the purchase and provision of anemometers (wind measuring instrumentation) and related services through colleges and universities without anemometers, and
2. the service, maintenance, and redeployment of anemometers through colleges and universities with existing anemometers.

Guidebook for Small Wind
OCE will develop a guidebook for small wind energy systems in New Jersey. Staff will develop the guidebook for residential and commercial use. Information on the following topics will be provided:

1. Permitting of small wind energy facilities, zoning issues and approaches;
2. Overview of New Jersey resources for small wind;
3. Summary of State and local wind regulations;
4. Recommendations from working with municipalities;
5. Review of Anemometer Loan Program; and
6. Other topics as determined and needed by the NJWWG.

Costs to Ratepayers

Funding for small wind energy systems will be from Clean Energy Program budget provided through the Societal Benefits Charge. Additional subsidy is anticipated through Renewable Energy Certificates purchased by Electricity Provider/Suppliers to comply with the RPS.

Savings to Ratepayers

A successful wind energy market in New Jersey would provide distributed energy resources predominantly located in coastal and rural areas that are able to alleviate congestion problems during peak periods, thereby contributing to reducing electric rates throughout the state during peak times.

Affected Sector(s)

Residential, Commercial and Industrial

Administrative Costs

OCE currently contracts for the services of Market Managers to implement New Jersey's CEP, these resources and OCE staff will provide the necessary support for this program. The NJSWWG was initiated by a small grant provided by the United States Department of Energy Wind Powering America Program and provides guaranteed funding through 2007. Staff costs are included in the 2007 and 2008 Clean Energy Program budgets.

Responsible Party

- NJBPU Office of Clean Energy
- NJSWWG members

Timeline of Action

- The NJSWWG is currently developing strategies to overcome small wind barriers and will make recommendations in the first quarter of 2009 for the benefit of small wind development.

Source of Funding

- Societal Benefits Charge funds will be used primarily to offset the initial cost of small wind energy systems.

Performance Metrics

- OCE staff will engage their existing NJWWG members to assist in developing of performance metrics.
- Capacity of onshore wind systems built in New Jersey.
- Amount of onshore wind electricity generated each year.

Biofuel

Strategy Description

Mandate 2% biofuel on all sales of space heating oil in New Jersey beginning 2015 increasing to 5% by 2020 at the wholesale level.

Energy Savings or Energy Production

31 million gallons or 4.35 TBTU of biofuel blended with heating oil by 2020.

Program Design

New Jersey produces an estimated 8.2 million dry tons (MDT) of biomass annually, concentrated mostly in the counties of central and northeastern New Jersey. Almost 75% of the biomass resource is produced directly by the state's population, much of it in the form of solid waste (e.g., municipal waste). Agriculture and forestry management are also potential sources of biomass, and account for the majority of the remaining amount. It is estimated that approximately 5.4 MDT (~65%) of the biomass could ultimately be available to produce energy, in the form of power, heat, or transportation fuels. The practically recoverable biomass could deliver up to 1,124 MW of power, (capable of producing ~9% of the state's electricity consumption) or 311 million gallons of gasoline equivalent (~5% of transportation fuel consumed) or 280 million gallons of distillate heating oil equivalent containing some 39 TBtu of energy.

While the optimal mix of the type and amount of energy derived from the recoverable bio-feedstock may be a function of a number of factors, including but not limited to public policies, supply demand balances, maturity of technologies etc. diversion of a modest amount of the bio-feedstock in the order of 10-12 % for the production of biofuel for blending with heating oil could assist in promoting alternative energy resources, reducing dependence on petroleum based fuel, increasing diversity of supply, reducing CO2 emissions, and more importantly reducing the exports of energy dollars by retaining them within the state and thereby furthering the Governor's economic growth and environmental objectives. Though the history of biofuel use in New Jersey is not old, in South Jersey some 7000 customers have been using 5% biofuel blended with 95% petroleum based heating oil for space heating purpose for a number of years - implying cost effectiveness as well as environmental acceptability. Currently, in New Jersey, some 107 TBtu of distillate, kerosene and propane fuel oil is used for heating homes and businesses. By 2020 this use is projected to decline to some 87 TBtus. A 5% target of bioheat based on projected 2020 consumption would require some 31 million gallons or 4.35 TBtu equivalent of biofuel. The projected biomass feedstock after diverting it for the 900MW of electric production is in the order of 224 MW electric equivalent or 53 million gallons of distillate oil equivalent.

In the long run, market forces will determine the optimal use of the bio-feedstock. However, in order to wean the state from dependence on foreign oil, improve the environment and create a market for recoverable biomass produced in the state, and in the short run to jump start and establish reasonable and consistent demand for biofuel and promote biofuel production in the State, New Jersey should follow the lead of states like Minnesota and Washington that have enacted legislation mandating fuel dealers to sell 2 percent biodiesel out of their total diesel sales. New Jersey, by enacting a biofuel mandate can open new markets for biofuels in the state, attract jobs, better use the current biomass that is land-filled and reduce concerns about oil prices and global warming. Further it would complement a similar Federal law called the Renewable Fuels Standard (RFS) that mandates the US reach 7.5 billion gallons of biofuel use by 2012. A modest

2% biofuel mandate on all sales of space heating oil in New Jersey beginning in 2015 and a 5% mandate by 2020 would push the development of biofuel in the most cost effective manner.

Costs to Ratepayers

Dependent on the cost of fossil fuel based heating oil. Given the recent price increases in oil, it may not take long for biofuels to compete with that price. Starting at a low percent mandate will allow for technology development and minimize costs to ratepayers.

Savings to Ratepayers

The development of alternative forms of heating oil offers the potential to mitigate the rapid increase in the cost of fossil fuel based heating oil that has occurred so far this decade.

Affected Sector(s)

Wholesale sellers of heating oil and heating oil consumers.

Administrative Costs

To be determined.

Responsible Party

- Legislature
- Wholesale Heating Oil Dealers
- BPU will be lead agency working with the Legislature

Timeline of Action

- By December 2008, enact biofuels mandate legislation on wholesale sales of heating oil beginning with 2% in 2015 and ramping up to 5% by 2020.

Source of Funding

- Wholesale Heating Oil Dealers

Performance Metrics

- Gallons of biofuel sold in the State.
- Gallons of biofuel produced in the State.

Biomass-fired Electric Production Capacity

Strategy Description

- Develop 900 MW of electric production capacity using biomass resources by 2020
- Increase the Class II RPS requirement to support construction of Class II electric production facilities.

Energy Savings or Energy Production

Energy generated 6,720 GWH.

Program Design

New Jersey has not only the highest per capita income in the U.S., it also has one of the highest rates of trash generated per person. It has the highest concentration of solid waste in the country as a result of its high population density and amount of waste per person. In addition to trash generated in-state, a significant amount of solid waste is shipped into NJ from New York City. New Jersey residents generate 6.7 pounds of trash per person per day, which is 2.2 lbs (49%) higher than the national average. Projections for 2015 indicate that the nearly 9 million residents will produce 7.4 pounds of solid waste per person per day or over 12 million tons per year. In 2003 New Jersey generated 19.8 million tons of solid waste.

While the recycling infrastructure in the state has made considerable gains in the recovery and beneficial reuse of spent resources, most local waste management systems still send a majority of their daily throughput to disposal. A significant portion of this non-recyclable or low-value fraction consists of mixed biomass wastes which have the potential to be separated and converted to feedstocks for bioenergy products. Waste-based bioenergy conversion technologies can enhance energy and environmental goals by utilizing waste materials to produce renewable sources of electricity. New Jersey has a unique opportunity to capitalize on the rapidly expanding renewable energy mandates at both the state and national levels by refocusing its handling of waste products from one of disposal to one of energy production. In 2003, the State recycled 10.3 million tons or 51.8% and 9.5 million tons were sent for disposal. Of the 9.5 million tons disposed, 1.5 million or 8% of the total waste generated went to resource recovery facilities.

Solid waste contains a tremendous amount of untapped energy. Nationally, it holds the potential to provide more than 33% of our projected energy needs for transportation and electricity by 2015. Conversion of solid waste to clean energy could become a major source of renewable energy to help New Jersey meet its goal of 22.5% renewable electricity by 2020. Currently New Jersey has 11 resource recovery facilities (incinerators) located in 9 counties. These facility combust four basic waste types: municipal waste, bulky waste (selected materials), vegetative waste and food processing waste. The majority of solid waste delivered to these facilities originates from sources located within the county. In 2005, MSW generation capacity was 177.3 MW. This represents 0.9% of the total 2005 generating capacity in New Jersey.

New Jersey produces an estimated 8.2 million dry tons (MDT) of biomass annually, concentrated mostly in the counties of central and northeastern New Jersey. Almost 75% of the biomass resource is produced directly by the state's population, much of it in the form of solid waste (e.g., MSW). Agriculture and forestry management are also potential sources of biomass, and account for the majority of the remaining amount. It is estimated that approximately 5.4 MDT (~65%) of the biomass could ultimately be available to produce energy, in the form of electricity, heat, or transportation fuels. The practically recoverable biomass could deliver up to 1,124 MW of

electricity, (capable of producing ~9% of the state's electricity consumption). About 800 MW of this capacity can be associated with the burning of MSW or Class II resource. The EMP is recommending a target of 900 MW of biomass electric production capacity, 800 MW derived from Class II and the balance 100MW capacity derived from Class I resources. Under the current RPS 2.5% of electricity sold by the LSEs is required to be produced from Class II resources. In order to facilitate construction of these resources the current RPS requirements for Class II resources needs to be increased to between 5-13 %. Any biomass facilities constructed in New Jersey would have to meet all environmental requirements of the NJDEP and should be sited in locations appropriate for the handling of feedstock so as not to cause health or aesthetic problems for the surrounding community.

An additional component of this strategy is to continue the work of the Biofuels task force that is chaired by Agriculture Secretary Kuperus in investigating the possibility of growing energy crops on portions of the land that are not currently being utilized or fully utilized for crop production. Sustainably grown energy crops that are converted into a fuel that is used to generate electricity would be a Class 1 renewable and would be able to receive RECs.

Costs to Ratepayers

Capital cost (2006$) is estimated between $2000-$2800/KW

Savings to Ratepayers

Providing clean additional sources of instate distributed generation, reduces the price volatility that could occur if fossil fuel based sources are required to address CO2 emissions in the future.

Affected Sector(s)

Load Serving Entities (LSEs)

Administrative Costs

To be determined.

Responsible Parties

- Agriculture, BPU and DEP
- Load Serving Entities

Timeline of Action

- The BPU will develop a strategy for achieving the development of biomass to achieve the following objectives by the end of 2008.
- Develop capacity as follows:
    - 50 MW by 2010; 200 MW by 2015; 900 MW by 2020.

Source of Funding

- Class I & Class II RECs, Production Tax Credit, incentives from the Clean Energy Program paid by the Societal Benefits Charge.

Performance Metrics

- New and total Class II installed capacity by year in MW.
- New and total Class II energy produced per year in GWH.
- Class I biomass capacity installed by year in MW.
- Class I biomass energy produced per year in GWH.

Increase the RPS for 2021 through 2025

Strategy Description

The BPU will evaluate whether the Renewable Portfolio Standard should increase the percentage of electricity required from renewable sources for the years 2021 to 2025. By 2020, 20% of electricity delivered to New Jersey customers must be "Class I" renewable energy, including electricity generation from solar energy, wind energy, wave or tidal action, geothermal energy, landfill gas, anaerobic digestion, fuel cells using renewable fuels, and other forms of sustainable biomass. By 2020, 2.5% must be "Class II" renewable energy, including electricity generated by hydropower facilities no greater than 30 MW, and resource-recovery facilities approved by the DEP and located in New Jersey.

Energy Savings or Energy Production

To be determined.

Program Design

The BPU will consider issues such as grid reliability, the possibility of electricity storage using plug-in hybrids or hydrogen, the cost and environmental impacts of additional offshore wind, possibly coupled with wave technology and the projected costs of solar technology.

Costs to Ratepayers

To be determined.

Savings to Ratepayers

While electricity from renewable sources is currently not cost competitive with other forms of electricity, continued improvements in renewable technology could lead to further reductions in cost and could provide ratepayers with a means to mitigate the increase in cost of electricity from conventional sources.

Affected Sector(s)

Residential, Commercial and Industrial

Administrative Costs

The preliminary study will be conducted with BPU Staff resources.

Responsible Party

BPU Office of Clean Energy

Timeline of Action

- The BPU will complete a preliminary evaluation by the end of 2008.
- Future updates of the Energy Master Plan will address this evaluation within the State's overall energy context.

Source of Funding

BPU assessment.

Performance Metrics

Completed preliminary evaluation by the BPU by the end of 2008.

Evaluate State Authorities to Influence Development of Low Carbon Emitting, Efficient Generation to Meet Demand

Strategy Description

Evaluate the State's current authorities to influence the development of new low carbon emitting, efficient power plants for New Jersey and close the gap between the supply and demand of electricity. Work with the Legislature to obtain additional authorities that may be needed. Projections that the market would respond and produce the types of new power plants that the New Jersey needs under EDECA's deregulation of electricity generation have not borne fruit. Therefore, it is necessary to examine the existing capabilities of State agencies to determine if there is sufficient ability to ensure that the amount and types of new power plants that the State wants built are actually constructed so that the future generation needs are met.

Energy Savings or Energy Production

Not yet quantifiable. The desired outcome of this strategy is to ensure the construction of the necessary generation to meet the state's electricity needs while also assisting in achieving the greenhouse gas emission targets established in the Global Warming Response Act.

Program Design

Getting the amount of new generation built that will meet the State's electricity needs and having those plants fueled in a manner that assists in meeting the State's greenhouse gas emission targets must be achieved using either existing authorities and tools or having new ones developed. The fastest and possibly most effective means to achieve these objectives is through the use of existing authorities and tools. However, if it is determined that new tools are necessary, the possibility of creating a power authority or a State Energy Council will be evaluated. The Governor's Policy Office will direct this examination, which will be completed by the end of 2008.

The creation of a power authority could help the State better meet its energy challenges. Legislation establishing a power authority would need to provide an initial funding source, with the goal to be self-supporting. Another option to achieve the desired energy infrastructure future for New Jersey would be the creation of a State Energy Council to coordinate the State's energy policies. This Council could be chaired by an Energy Policy Director, appointed by the Governor, and would convene monthly meetings with the BPU, DEP, DOT, DCA, and EDA to do the following:

- coordinate the siting and financing of new electricity generation and transmission lines;
- coordinate the development of policies to meet New Jersey's energy challenges, including energy efficiency and renewable energy programs;
- target State energy investments in regions of New Jersey that experience serious transmission line congestion; and
- update the State's Energy Master Plan.

If the commission model were adopted, the Energy Policy Director would be responsible for reviewing and approving all energy rules and regulations that are adopted by the State, to ensure consistency with the Energy Master Plan and the State's energy policy.

Costs to Ratepayers

Not yet quantifiable

Savings to Ratepayers

Not yet quantifiable

Affected Sector(s)

Every state sector—residential, commercial and industrial—using electricity would benefit from efforts to secure sufficient, clean and lower cost power for the state. .

Administrative Costs

To be determined.

Responsible Party

- Governor's Office and Legislature

Timeline of Action

- The Governor's Policy Office will direct this examination, which will be completed by the end of 2008.

Source of Funding

- To be determined.

Performance Metrics

- Amount and type of new generation built in New Jersey by year.
- Savings in rates
- Capacity of sustainable, clean energy for NJ

Combined Heat and Power (CHP) Retail Margin Fund Incentive to Develop 1500 MW of Cogeneration

Strategy Description

Provide financial incentives from the available Retail Margin fund for Commercial Industrial Energy Price (CIEP) customers to assist in the development of on-site cogeneration power plants.

Combined Heat and Power (CHP) is an efficient, clean, and reliable approach to generating power and thermal energy from a single fuel source. By installing a CHP system designed to meet the thermal and electrical base loads of a facility, CHP can increase operational efficiency and decrease energy costs, while reducing emissions of greenhouse gases that contribute to climate change. Conventional power plants emit the heat created as a byproduct of electricity generation into the environment through cooling towers, as flue gas or by other means. CHP captures the byproduct heat for domestic or industrial heating purposes, either very close to the plant, or for distribution through pipes to heat and or cool local residential, commercial and institutional buildings (district heating). In separate production of electricity most of the energy must be rejected as waste heat, whereas in CHP the potential for production of high quality energy (electricity or work) is saved. CHP is thermodynamically the most efficient use of fuel. The heat recovery or waste heat utilization enables CHP operations to achieve efficiencies of over 80% or 40-50% higher than large conventional central electrical generation power plants.[1] Byproduct heat recovered is typically between 250 degrees and 900 degrees F and can also be used in thermal chillers (absorption or steam turbine drive) for cooling besides the traditional thermal uses such as process heating, hot water and space heating. CHP plants with the production of "cooling" are referred to as Combined Cooling Heat and Power (CCHP) plants or are more commonly referred to as trigeneration or polygeneration plants. Since the cooling provided by a CCHP plant directly displaces on peak electric power from the grid it can effectively reduce or defer the need for additional peaking capacity requirements.

Strategically located CHP/CCHP facilities can reduce transmission congestion by reducing the power requirement from the grid. Since northern New Jersey is presently facing large transmission congestion costs an aggressive CHP/CCHP initiative can significantly reduce those costs. Accordingly, New Jersey should develop an aggressive on-site CHP/CCHP initiative for large energy users and multiple customers. With energy efficiency, load management, and distributed generation, CHP/CCHP can provide congestion relief.

The KEMA report[2] identified an accelerated market penetration potential of 2104 MW by 2020, the EMP stakeholder working group recommended a target of 1500 MW of CHP by 2020. Developing 1500 MW of CHP as a distributed resource would displace the need for two medium sized base load power plants. Where public funds are used to incent the development of CHP, it is suggested that a minimum combined efficiency standard be established to qualify as CHP distributed resources. A minimum 70% combined efficiency standard would be appropriate. In order to maximize the benefit of CHP as a distributed resource, consideration should be given to the issue of the sizing of such systems. Under current applications, CHP systems are designed to meet less than 100% of the host site electrical load with the balance of the electric load, particularly the peak load met by the local utility. This often contributes to higher peaks for the

[1] "Combined Heat and Power: The Efficient Path of New Power Generation" American Council for an Energy Efficient Economy. http://www.aceee.org/energy/chp.htm. Accessed June 29, 2007

[2] "New Jersey Energy Efficiency and Distributed Generation Market Assessment."

local utility and the grid at large with attendant costs. The under sizing is to a large extent due to traditional investment models and lack of financial incentives to size units up to or over the on-site energy needs. The electric grid and all ratepayers would benefit if CHP systems are sized to meet at least 100% of site needs. It is also possible to size CHP plants with larger capacity to allow export capability. Systems can be generally sized to provide up to 30% export capacity to meet system peak needs and yet retain ability to economically meet on-site needs during off peak times.

A judiciously crafted CHP initiative can be an effective economic strategy to reduce energy cost to end users. As CHP host sites are mostly large energy users this will provide a major economic incentive to industrial and commercial businesses to invest in their existing facilities and to locate in New Jersey. Further, there is also an opportunity to include renewable energy as part or all of the fuel resources used to power a CHP facility.

Energy Savings or Energy Production

For the Retail Margin funded initial program 2008-2009: Retail Margin Funds of $90,000,000 would support 257 MW of installed CHP generating capacity ($350/kW). Due to construction and permitting lead times these funds will not be actually expended until projects start commercial operation with the first plants expected to be on line in 2009.

The total program goal of 1500 MW through 2020 is estimated to be distributed as follows:

	MW	GWh
2010	136	955
2015	818	5733
2020	1500	10540

Program Design

Implement a Rebate Incentive Program with Pay for Performance, under which the State will provide an incentive to develop on-site cogeneration. These incentives will be similar to those currently provided to on-site generation in NY and CT which offset the high initial cost to develop these capitol intensive power generation projects. The proposed mechanism is to pay CHP/CCHP projects for delivered energy over a four year period as opposed to previous programs which were based on a one time payment based on installed or nameplate capacity. The net present value calculated as a function of installed generation capacity is $350/kw. The exact distribution between electrical output and thermal output will need to be established through a proceeding with stakeholder input. The minimum efficiency for these projects is proposed as 70%.

It is anticipated that Global Warming Solutions Fund monies under the RGGI Act will be available to support the development of the additional capacity to be constructed with this program. However, the incentive level is anticipated to decrease over time.

Costs to Ratepayers

None.

Savings to Ratepayers

Savings to overall ratepayer will occur due to reduction of overall demand and imported electricity. Detailed modeling of this component of the electric supply is included in the analysis being performed by Rutgers (CEEEP). Savings to participating CHP/CCHP hosts are dependent on size and other factors. Savings typically can be up to 25% of the host sites overall energy costs.

Affected Sector(s)

CHP projects currently are provided rebates under New Jersey's Clean Energy Programs but are capped at one megawatt. This program is targeted at larger energy users with electric peak demand in the 2-24.9 MW range

Administrative Costs

To be determined based on implementation and management structure. It is anticipated that grants will be issued in conjunction with the NJ Economic Development Authority.

Responsible Party

- Board of Public Utilities

Timeline of Action

- BPU issues solicitations for projects using Retail Margin funds in 2008.
- Project awards issued within six months after solicitation proposals being received.
- DEP data base development by December 2007.
- BPU market assessment completed in 2008.
- BPU technical assistance and EDA loans – on going program to 2020.

Source of Funding

- 2008-2009: Retail Margin Funds $90,000,000
- 2010-2020: Global Warming Solutions Fund monies from RGGI carbon credit auction estimated at $42,000,000/year

Performance Metrics

- Annual CHP/CCHP installed capacity in MW.
- Annual CHP/CCHP electricity production in MWh.
- Annual CHP/CCHP thermal output for heating/cooling requirements in MMBtu.

Sales and Use Tax Exemption for Combined Heat and Power (CHP)

Strategy Description

Provide tax exemption from Sales and Use Tax (SUT) for natural gas used to generate on-site power in approved CHP facilities. Currently CHP units installed prior to March 10, 1997 are exempt from SUT for natural gas used as cogeneration fuel. Independent power producers (IPP) which do not provide on-site electric power but export their power to the electric grid are exempt from SUT on the natural gas consumed in their generation plants. Since 1997 only one large and a small number of CHP projects have been developed in New Jersey. This exemption will remove a significant disincentive which will assist in the development of on-site cogeneration power plants in New Jersey.

A judiciously crafted CHP initiative can be an effective economic strategy to reduce energy cost to end users. The proposed SUT exemption addresses the cost of fuel for CHP. This strategy complements the strategy entitled, "CHP Retail Margin Fund Incentive to Develop 1,500 MW of Cogeneration" which outlines the overall benefits of increasing CHP in New Jersey. Cogeneration economics are highly sensitive to fuel costs with fuel being the largest annual expenditure far exceeding debt service, labor and taxes combined. As CHP host sites are mostly large energy users this will provide a major economic incentive to industrial and commercial businesses to invest in their existing facilities and to locate in New Jersey. Further, there is also an opportunity to include renewable energy as part or all of the fuel resources used to power a CHP facility.

Energy Savings or Energy Production

This exemption supports the overall EMP goal of developing 1500 MW through 2020. This is estimated to be distributed as follows:

	MW	GWh
2010	136	955
2015	818	5,733
2020	1,500	10,540

Program Design

The State to provide a tax exemption from Sales and Use Tax (SUT) for natural gas used to generate on-site power in approved CHP facilities. The tax exemption would apply to CHP facilities which produce on-site energy for electric and thermal use stakeholder input.

Costs to Ratepayers

None.

Savings to Ratepayers

Savings to overall ratepayers will occur due to reduction of overall demand and imported electricity. Detailed modeling of this component of the electric supply is included in the analysis being performed by Rutgers. Savings to participating CHP hosts are dependent on size and other factors.

Affected Sector(s)

Residential, Commercial and Industrial

Administrative Costs

To be determined based on implementation and management structure.

Responsible Party

- NJ Department of Treasury

Timeline of Action

- Treasury with BPU assisting to develop recommended tax revisions.
- Legislative action to be completed by July 2009.

Source of Funding

- Reinstating the Sales & Use Tax exemption for fuel used in new CHP facilities will provide an additional incentive for developing those facilities without adversely affecting state tax revenue, since only one large CHP facility has been developed since the exemption was cancelled in 1997.

Performance Metrics

- The effectiveness of this exemption will be measured in conjunction with other measures taken to support the EMP goal of 1,500 MW of CHP by 2020.

Consideration of the Need for a New Nuclear Plant in New Jersey

Strategy Description

The State will hold public meetings to discuss the need for a new nuclear plant, including siting, permitting, financing and waste disposal issues.

Energy Savings or Energy Production

A new nuclear plant would generate a large amount of electricity, depending on the size of the plant.

Program Design

The current fleet of power plants in our State cannot be expected to supply all of the projected electricity needs, especially when much of the fleet is aging, expected to retire, or likely to be exporting its power. Even by maximizing renewable energy and energy efficiency it is likely that the State cannot meet its future energy needs without new generation. In addition, factoring greenhouse gas emission issues and costs requires the examination of additional nuclear power. A nuclear plant could help to mitigate energy and capacity prices.

The examination of building another nuclear plant in New Jersey will commence with a series of public meetings to review the need for and siting, permitting, financing and waste disposal issues associated with building a new plant. The analysis of the need for a new nuclear plant will include the feasibility of other types of technologies, including renewables with minimal or no carbon dioxide emissions meeting the State's electricity needs.

Costs to Ratepayers

Not applicable

Savings to Ratepayers

Not applicable

Affected Sector(s)

Electricity generators, Public Utilities, Municipalities, Environmental Groups, and Residential, Commercial and Industrial Customers

Administrative Costs

This initiative is not anticipated to result in additional costs to the State.

Responsible Party

Governor's Office of Policy

Timeline of Action

The public meetings will be completed in by the fourth quarter of 2008.

Source of Funding

Not applicable

Performance Metrics

To be determined after completion of the public meetings.

Facilitate Siting of Clean Generation Sources

Strategy Description

The State will facilitate the appropriate siting of clean generation sources.

Energy Savings or Energy Production

N/A

Program Design

The NJDEP will continue to promote clean and efficient cogeneration projects, in its interaction with applicants for electric and heat generation facilities and its interaction with the public. Working with other State agencies, the regulated community, and the general public, we will consider additional permit streamlining to spur clean and efficient energy use.

Costs to Ratepayers

Implementation of this strategy increases capital costs and decreases operating costs. Over the long term, costs should be less, resulting in lower heating and electricity costs. If capital costs are spread over the long term (i.e. 10 to 20 years), which is consistent with the long term nature of the Energy Master Plan, there should be lower electricity costs.

Savings to Ratepayers

See above.

Affected Sector(s)

Electricity generators

Administrative Costs

This initiative is not anticipated to result in additional costs for the NJDEP. The air permitting program already advocates clean cogeneration and also requires that it be considered for major new electric generating projects which increase emissions significantly, as a routine component of its existing air pollution control responsibilities."

Higher capital costs are born by businesses installing cogeneration. Over the long term, these higher capital costs should be more than offset by reduced operating costs (lower fuel use). Companies need long term vision and possibly economic incentives to accept longer term return on capital investment.

Responsible Party

- Department of Environmental Protection

Timeline of Action

- Ongoing

Source of Funding

- Established fees paid by applicants to the Department of Environmental Protection.

Performance Metrics

- Number of permits issued for new generation facilities.

For Natural Gas Supply, Assess Future Pipeline Capacity Requirements

Strategy Description

Conduct a future needs assessment of interstate and intrastate pipeline capacity requirements. Determine the amount of natural gas needed to meet projected 2020 base load and peak-day requirements for New Jersey. Assess how proposed LNG facilities would impact supply availability and pipeline capacity requirements.

Energy Savings or Energy Production

N/A.

Program Design

The demand for natural gas in New Jersey is impacted by a number of factors, not the least of which is weather. As a result, gas companies prefer to limit their forward-looking demand projections to 5 years or less. However, given the important role natural gas will play in the success of the EMP, both as a major energy source for end-users and as a primary fuel for electric power generation, a long-term comprehensive assessment of the capacity requirements for the state is need.

As the suppliers of last resort, New Jersey's local distribution gas companies (LDCs) are responsible for the firm service needs of their customers, and are therefore in the best position to assess the future natural gas needs for New Jersey. As such, the LDCs should conduct a comprehensive analysis and future needs assessment of pipeline capacity to ensure a stable and adequate supply for New Jersey, now and in the future. At a minimum, each company's analysis should include:

1. The projected average daily and peak-day needs for each sector (i.e., residential commercial, etc.) through the next decade (2020).
2. The projected interruptible customers demand through 2020
3. The projected electric power generation needs through 2020.
4. The local and regional storage needs (gas and LNG).
5. The projected infrastructure expansion needs through 2020 (interstate and intrastate).

Costs to Ratepayers

Negligible – surveys and modeling costs performed initially and updated periodically will be passed on in the rate cases and spread across all customer classes.

Savings to Ratepayers

Since natural gas is used both as an end-use energy source and a primary fuel for electric power generation and industrial processing, the potential savings will show up indirectly in the overall annual energy bill. Actual dollar savings are impossible to predict.

Affected Sector(s)

Residential, commercial and industrial

Administrative Costs

Negligible

Responsible Party

- BPU to issue an order
- New Jersey's local natural gas utilities to conduct the survey

Timeline of Action

- Board to issue an order in 2008.
- Initial analysis and assessment by year end 2009.
- Updates every 3 years thereafter.

Source of Funding

- Ratepayers

Performance Metrics

- Average and peak usage by sector as compared to projections.
- End of year capacity levels in MMcf/d for New Jersey's interstate pipelines.
- Average daily flows in MMcf/d for New Jersey's interstate pipelines.
- Utilization rates for New Jersey's interstate pipelines.
- Average annual load factors for New Jersey's interstate pipelines.
- Annual infrastructure expansion rate for New Jersey's interstate and intrastate pipelines.
- Local and regional storage capacity.

Clean Energy Technology

Strategy Description

Create a Clean Energy Technology Fund that would support the development of energy efficiency and renewable manufacturing businesses in New Jersey. Provide funding to the Edison Innovation Fund to commercialize energy efficiency and renewable energy businesses from the research and development stage.

Energy Savings or Energy Production

None directly, however, any energy efficiency or renewable products made in New Jersey that are used in the state will produce either savings or generation respectively.

Program Design

The New Jersey Economic Development Authority (NJEDA) is establishing the Clean Energy Technology Fund and the BPU has provided $11 million in 2008 Clean Energy Program (CEP) funds for a renewable energy and energy efficiency Manufacturers Incentive Program. Funding requests are anticipated to be in the $5- $10 million range with about $2 million the average recoverable grant size (based on 30% funding). At most half will be funded in the same year as the initial commitment since initial payments will be for facility and site studies and design and pre-production development, which will be less than half of the commitment. Therefore, it is anticipated that about 10 companies could be funded annually. The straw proposal for the CEP budgets for 2009-2012 continues this funding level.

NJEDA will devote $4 million in 2008 CEP funds for the Edison Innovation Research and Development Fund to provide grants to about 8 renewable energy and energy efficiency companies. There will be a $500,000 maximum research and development grant (with $100,000 of non-R&D funding). Research and development is critical to advancing the efficiencies and lowering the costs of the renewable energy and energy efficiency technologies. Many of these supplier companies will be partnering and obtaining contracts with the renewable energy manufacturers and energy efficiency companies and may include start-up renewable energy manufacturers. All of these companies will benefit from a grant rather than receiving a loan at this start-up stage. The straw proposal for the CEP budgets for 2009-2012 continues this funding level.

The possibility of identifying other funds for these programs will be considered in the future and could include utilizing penalties collected by one or more state agencies.

Costs to Ratepayers

The CEP budget allocates $15 million per year from 2008–2012 that is funded by the Societal Benefits Charge.

Savings to Ratepayers

The development of new energy efficiency and renewable energy technologies offers the opportunity for savings in the future as these new technologies utilize energy more efficiently or generate energy cheaper.

Affected Sector(s)

Industrial

Administrative Costs

NJEDA's administrative costs will be part of the $15 million annual budget. CEP administrative costs will be included in the annual budget.

Responsible Party

- New Jersey Economic Development Authority (NJEDA)
- Board of Public Utilities

Timeline of Action

- The Board of Public Utilities approved the 2008 CEP budget on December 20, 2007. It is anticipated that NJEDA will be able to begin implementing these programs in the second quarter of 2008.
- The Board of Public Utilities will take action on the 2009-2012 CEP funding levels in the summer of 2008.

Source of Funding

- Societal Benefits Charge

Performance Metrics

- Number and amount of grants issued from the Edison Innovation Fund;
- Number of jobs created as a result of the grants;
- Number and amount of incentives provided from the Clean Energy Technology Fund;
- Number of jobs created as a result of the incentives;
- Amount of renewable energy capacity manufactured as a result of the incentives.

Green Collar Jobs Initiative

Strategy Description

To achieve the Governor's goal for a 20% energy use reduction by 2020 will require the improvement of over 300,000 existing buildings per year. This is a huge but achievable task if we design, develop and implement the 'right' programs in a timely manner and work in partnership with the electric and natural gas utilities; the energy service contractors and installers; state and local government agencies; and environmental, energy and business organizations.

The challenge of equipping New Jersey with a sufficient pool of qualified energy professionals, designers, raters, installers, contractors and equipment manufacturers to accomplish these goals represents a major economic development and job growth opportunity. Establishing training programs and grooming a green workforce will be essential to meeting the goals of the EMP and the Global Warming Response Act.

Energy Savings or Energy Production

This initiative will equip New Jersey with an expanded skilled labor force to design and install energy efficiency and renewable energy projects in New Jersey to meet the EMP's goal of a 20% energy use reduction by 2020. That savings goal represents 20,000 GWhs of electricity and 119 trillion Btus of natural gas and oil. While increasing new energy appliance standards and increasing the efficiency of the energy subcode for new building construction should address approximately 25% of the EMP goal, the remaining 75% will need to be achieved by improving the energy efficiency among existing buildings comprising 3.2 million homes and 450,000 commercial and industrial buildings. Of note, overall existing building stock includes at least 180,000 homes and families that are at or below 175% of the federal poverty level. The existing Comfort Partners program assists approximately 7,000 families per year by fully funding all cost effective energy efficient upgrades including lighting, appliances, furnaces, boilers, hot water heaters, insulation, weatherstripping and windows. If New Jersey adopts a whole buildings approach to energy efficiency, it will require, in part, significant expansion of workers similarly skilled to those who implement Comfort Partners.

Program Design

Increasing the penetration rate of energy efficiency improvements rapidly throughout all of New Jersey's existing building stock will require an aggressive program to train a statewide, capable corps of Green Jobs workers. A two prong approach to train and educate a "green collar" jobs work force will be implemented:

- training and education for project design and installation workforce; and
- training and education for jobs related to the manufacture and sale of energy efficient products, appliances and equipment.

New Jersey should work to attract energy efficiency equipment manufacturers to the state such as makers of energy efficient windows and doors, weather-stripping, insulation, heat pumps, furnaces, chillers, motors, lighting systems, energy monitoring systems and hot water heaters. Other states in our region are also viewing energy efficiency as an industry ripe for economic development and are developing programs to attract related businesses. By demonstrating a commitment to developing a skilled Green Jobs workforce, New Jersey may assert an advantage over other states in locating these equipment, design and manufacturing businesses locally.

To best facilitate job development, the State should inventory the number and types of energy businesses already established in New Jersey and survey those businesses to determine what they would need to expand in New Jersey. The BPU is working with EDA on the latter part of this analysis. The DOL and EDA will develop a report on the size and background of energy efficiency companies that are currently operating in New Jersey. The DOL has convened an Industrial Workforce Advisory Committee (IWAC) to construct recommendations on how to develop "Green Collar" jobs in New Jersey.

The IWAC should consider the following three mechanisms for "Green Collar" jobs training:

1. Development of an eight-week intensive startup energy auditing course. It is projected that each of the existing building will need to be audited or rated for their energy use over the next 12 years. This startup energy auditing would provide the basics in energy auditing. The result would be an immediate job readiness and an available pool of workers essential to start up. These trained auditors could work within the Comfort Partners program thus expanding the availability of this program. The initiation of this training program could be in urban areas and delivered through our County Community Colleges with downtown campus. This startup energy auditing training could be expanded to longer training programs so the startup auditors could be trained as energy raters. This could lead to jobs working with the Home Energy Raters program or the Home Performance with Energy Star program. This initial training could be expanded to all County Community Colleges statewide. The training in these areas would be similar to certificates for building inspectors currently implemented at County Community Colleges.

2. Expanding the training at County Vocational Tech High Schools and County Community Colleges for Heating, Ventilation and Air Conditioning contractors and for building contractors. The majority of the energy efficiency jobs will be installing furnaces, boiler, hot water heaters , air conditions, chillers, motors, lighting and energy monitoring and control systems. If the current and future potential workforce in this area is not trained and re- trained to implement the best and newest technologies and procedures, the energy goals we adopt will not be achieved. The energy efficiency technology area as discussed above is posed to grow and expand with new technology and equipment that will transform the market several times over. This newer technology and equipment must be adopted by the current licensed contractors for the market transformation goals to be achieved.

3. Development of a two year Associates degree for an energy associates at Community Colleges and the development of a four year BS degree for an energy engineers at State Universities and Colleges. These would include training for energy design and modeling and equipment design and manufacturing. This could provide the trained workforce to attract energy efficient manufacturing companies.

We recommend that the IWAC focus on energy efficiency as the core for Green Jobs development in New Jersey for the above reasons.

Costs to Ratepayers

Funding is included in the Clean Energy Program 2008 budget.

Savings to Ratepayers

The expansion of the "green collar" jobs workforce in New Jersey will expedite the installation of energy efficiency improvements to existing building stock thereby enabling occupants to reduce energy costs and the expansion of green jobs and related businesses will have a positive effect on the economic growth in New Jersey.

Affected Sector(s)

Residential, Commercial and Industrial

Administrative Costs

Each agency will cover its respective share of administrative costs from its existing budget.

Responsible Parties

- New Jersey Department of Labor and Green Jobs IWAC;
- New Jersey Department of Education;
- Governor's Office of Economic Growth;
- Board of Public Utilities.

Timeline of Action

- The Department of Labor and the EDA will produce an inventory of existing energy-related businesses in New Jersey by July 2009.
- EDA and BPU to survey existing businesses by December 2009 to determine what would need to be done to facilitate their expansion in New Jersey to meet EMP goals;
- DOL, EDA, OEG and BPU to initiate discussions with the Department of Education, State university, county college and vocational tech school decision-makers to begin the process of developing Green Jobs curriculum and secure necessary approvals and funding to implement programs by the third quarter of 2008.

Source of Funding

- The Clean Energy Program 2008 budget allocates $400,000 for a job training pilot.

Performance Metrics

- Timely expansion of DOL IWAC to include input from EE product and equipment manufacturers;
- Completion of inventory by DOL and EDA of New Jersey energy-efficiency-related businesses.
- Completion of survey of energy-related firms by EDA and BPU to determine training and expansion needs;
- Implementation of Energy Auditor training to facilitate rapid escalation of Comfort Partners penetration rate;
- Design and implementation of vocation schools training programs;
- Design and implementation of both associate and bachelor degree programs;
- Number of people trained;
- Increased number of workers in green collar jobs.