

New Jersey Energy Master Plan Implementation Strategies

A Companion Document to the New Jersey Energy Master Plan October 2008

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Energy Efficiency Program for Existing Buildings

Strategy Description

Establish an integrated Energy Efficiency (EE) program for Existing Buildings, including utilization of Combined Heat and Power to displace space heat and process heat requirements in the commercial and industrial sectors, 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 EEPG	ELECTRICITY GWH	NATURAL GAS TBTU	HEATING OIL TBTU
EE 20% REDUCTION GOAL	19500	99.019	11.732
EXISTING BUILDINGS			
Heat from CHP:			
<i>Commercial</i>		23.836	2.831
<i>Industrial</i>		6.345	0.288
Subtotal		30.181	3.119
Balance Savings obtained through Whole Building Approach:			
<i>Residential</i>	6548	19.281	0.989
<i>Commercial</i>	7830	11.294	1.041
<i>Industrial</i>	943	4.303	3.372
Subtotal	15321	34.878	5.402
Total	15321	65.058	8.522
% of TARGET	78.57%	65.70%	72.63%

Program Design

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.

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.

For existing buildings, 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 be run by the electric and gas utilities and 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.

The BPU has engaged the Northeast Energy Efficiency Partnerships (NEEP) to assist in developing a plan during 2008 to achieve the 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 is utilizing a team of nationally recognized experts and the project is being 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.).

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 1,200 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 has established the next four year funding cycle (2009-2012) for the Clean Energy Program that provided additional funding for energy efficiency programs. Annual budgets will be completed by the end of each calendar year for the upcoming calendar year.
- The BPU will work with the utilities to develop utility administered energy efficiency programs for energy efficiency that will transition the energy efficiency programs of Clean Energy Program to the utilities.
- 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 by December 2008;
 - BPU action on proposed strategies in first quarter 2009.

Source of Funding

Energy savings from energy efficiency investments, Societal Benefits Charge, PJM’s Regional Pricing Model, federal tax incentives, 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, in 2007, of the 2006 IECC building code for residential structures and ASHRAE 90.1-2004 for commercial structures will reduce in 2020, electric consumption by some 589 GWh, natural gas consumption by some 10.371 TBtu and oil consumption by some 0.296 TBtu. Further, 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 965 GWh, natural gas consumption by 17.523 TBtu and heating oil consumption by 0.492 TBtu.

2020 EEPG	ELECTRICITY GWH	NATURAL GAS TBTU	HEATING OIL TBTU
EE 20% REDUCTION GOAL	19500	99.019	11.732
2006 IECC Building Code Upgrade			
<i>Residential</i>	168	8.58	0.09
<i>Commercial</i>	384	1.760	0.201
<i>Industrial</i>	37	0.033	0.008
Subtotal	589	10.371	0.296
HERS70 Building Code			
<i>Residential</i>	284	14.52	0.15
<i>Commercial</i>	651	2.979	0.340
<i>Industrial</i>	31	0.028	0.007
Subtotal	965	17.523	0.492
Total	1554	27.894	0.788
% of TARGET	7.97%	28.17%	6.71%

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 (S702) is pending 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. S702 was reported out of the Senate Economic Growth Committee and referred to Senate Budget and Appropriations Committee on October 2, 2008. 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 \$4,266. This incremental cost is less than one percent of the cost of a new home in New Jersey, based on 2007 average sales price data.,

Savings to Ratepayers

Energy savings is estimated to be 30% or 1,209 kWh and 625 therms per year per average residential building built to the enhanced energy code requirements from current standards. The incremental cost to build a HERS70 building would cost \$4,266 and provide a savings of \$1,119 per year. This represents a simple payback of less than four 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 January 2009.
- DCA to adopt implementing rules by December 2009.
- DCA to incorporate new standards in its training program by December 2009.
- DCA to consider additional code changes every three years based on updated cost projections.

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.

Net Zero Carbon-emitting Buildings

Strategy Description

The DCA, DEP and BPU staffs will work together to develop a statewide strategy to achieve net zero carbon emitting buildings for all new and existing buildings including both homes and commercial and industrial buildings. In developing this strategy, they will identify regulatory, statutory, and other changes that will be necessary in order to achieve this goal for new construction and existing buildings. Working together with stakeholders, they will also identify a reasonable period of time along with milestones that will put the state on this path. This will include annual percentage goals to achieve net zero carbon buildings within the established timeframe. The plan will be submitted to the State Energy Council by the end of 2009.

Energy Savings or Energy Production

To be determined.

Program Design

To be determined.

Costs to Consumers

Incremental cost from existing standards for a residential home built to net zero carbon emissions to be determined.

Savings to Ratepayers

To be determined.

Affected Sector(s)

Residential, commercial and industrial

Administrative Costs

To be determined.

Responsible Party

- Department of Community Affairs, DEP, BPU
- Legislature

Timeline of Action

DCA, DEP, BPU to submit a plan to the State Energy Council by December 2009.

Source of Funding

To be determined.

Performance Metrics

- Number of homes built to new standard.
- Square footage of Commercial and Industrial buildings built per year to new standard.
- Number of existing homes retrofitted to meet net zero standard.
- Square footage of Commercial and Industrial buildings retrofitted to meet net zero standard.

Appliance Standards

Strategy Description

Set minimum-efficiency standards for appliances and other types of equipment currently not covered by EPAAct2005 and EISA2007.

Energy Savings or Energy Production

Appliance Standards Already Adopted – The standards enacted by Congress pursuant to Energy Policy Act of 2005 and Energy Independence and Security Act of 2007 (in response to the actions of New Jersey and other states), will result in a reduction in annual energy consumption of 2,279 GWh of electricity, 3.459 Tbtu of natural gas and 0.095 Tbtu of fuel oil in 2020. The following table lists the appliance for which standards have already been established either at the federal or New Jersey state level.

Appliance	Year Adopted	Savings Per Year	Number Sold Per Year	Incremental Cost
Electric Appliances/Products Already Adopted either by NJ or Federal Governments				
Ceiling Fans	2007	132 kWh	195,600	\$6
Commercial Clothes Washers	2007	197 kWh	6,800	\$137
Commercial Refrigerators and Freezers	2010	738 kWh	5,000	\$37
Exit Signs	2007	223 kWh	19,500	\$20
Large Packaged AC	2010	7,000 kWh	300	\$1,176
Torchieres	2007	288 kWh	135,500	\$20
Traffic Signals	2007	430 kWh	13,200	\$85
Dehumidifiers	2007	155 kWh	31,900	\$1
Ice Makers	2010	445 kWh	7,100	\$30
Walk In Refrigerators and Freezers	2009	8,220 kWh	1,900	\$1,957
HID Lamp Ballasts	2008	379 kWh	48,500	\$40
Metal Halide Lamp Fixtures	2009	307 kWh	70,100	\$30
External Power Supplies	2009	4 kWh	5,000,000	\$0.50
Reflector Lamps	2009	61 kWh	3,000,000	\$0.70
Medium Voltage Dry Type Transformers	2010	6 kWh	204,000	\$2
Low Voltage Dry Type Transformers	2008	22 kWh	416,500	\$3
TV Converter Boxes	2009	96 kWh	264,000	\$5

Appliance	Year Adopted	Savings Per Year	Number Sold Per Year	Incremental Cost
Heating Oil Appliances/Products Already Adopted either by NJ or Federal Governments				
Oil Furnaces	2015	25 gallons	6,200	\$14
Oil Boilers	2012	59 gallons	8,200	\$29
Natural Gas Appliances/Products Already Adopted either by NJ or Federal Governments				
Unit Heaters	2009	200 therms	4,600	\$276.50
Pre Rinse Spray Valves	2007	336 therms	9,900	\$5
Natural Gas Boilers	2012	62 therms	11,800	\$114
Commercial Clothes Washers	2007	33 therms	6,800	\$137

Future Standards for Appliances not covered by EPAct2005 and EISA2007

Raising standards for the appliances listed below will reduce annual energy consumption by 345 GWh of Electricity and 2.6 Tbtu of Natural Gas by 2020.

Appliance	Target Year for Potential Implementation	Potential Savings Per Year	Estimated Sales Per Year	Estimated Incremental Cost
Natural Gas Appliances/Products Not Yet Adopted				
Natural Gas Furnaces	2015	81 therms	44,600	\$372
Pool Heaters	2015	58 therms	7,000	\$295
Electric Appliances/Products Not Yet Adopted				
Water Dispensers	2011	266 kWh	3,700	\$12
Hot Food Holding Cabinets	2011	1,815 kWh	500	\$453
Furnace Fans	2014	615 kWh	69,500	\$100
Compact Audio Equipment	2011	53 kWh	191,000	\$1
Cable Boxes	2011	50 kWh	173,000	\$5
DVD Players	2011	11 kWh	137,000	\$1
Portable Electric Spas	2011	250 kWh	3,100	\$100

Program Design

The American Council for an Energy-Efficient Economy (ACEEE) identified opportunities for state governments and the federal government to set minimum-efficiency standards for a number of appliances and other types of equipment currently not covered by EPAct2005. The Energy Independence and Security Act of 2007 adopted standards for some of the appliances identified by ACEEE, leaving a number of appliances without federal standards.

On March 13, 2008, the Assembly passed amended Appliance Standard legislation A1763 sponsored by Assemblywomen Coleman and Greenstein. Senator Kean introduced identical bill S1253 on February 21st, which was referred to Senate Economic Growth Committee.

The amended A1763 requires the BPU and the Commissioner of Community Affairs to establish minimum energy efficiency standards for the following new products sold, offered for sale, or installed in the state:

- Bottle-type water dispensers;
- Commercial hot food holding cabinets; and
- Natural gas and propane fired residential furnaces.

This will still leave out the following of appliances for which standards should be established in the future:

- Pool Heaters;
- Compact Audio Equipment;
- Cable Boxes;
- DVD Players; and
- Portable Electric Spas.

Costs to Consumers

- **Existing Appliance Standards:** \$121 average incremental cost increase. Products range from personal electronics (\$1) to commercial grade walk-in refrigerators and freezers (\$1,957).
- **Future Standards for Appliances:** \$255 average incremental cost increase. Products range from additional personal electronic products (\$1) to hot food holding cabinets (\$453).
- **Incremental cost of products:** Simple payback of less than 1.7 years.

Savings to Ratepayers

Under **Existing Appliance Standards**, for every dollar spent on increased appliance efficiency, the ratepayer will save between \$.75 and \$1,000 in annual energy costs. This will result in cumulative savings of over \$800 million dollars to businesses and consumers through 2020.

Cumulative savings under **Future Standards for Appliances** is projected to be over \$115 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

- Legislature
- Board of Public Utilities
- Department of Community Affairs

Timeline of Action

- Enact enabling legislation as provided for in A1763 and S1253 by July 2009.
- BPU to work with other states to join in a multi-state certification system by December 2009.
- 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.

Annual Review of Appliance Standards Nationwide

Strategy Description

The BPU will work with the DCA staff to conduct an annual review of new appliance equipment and appliance energy efficiency improvements to determine whether new energy efficiency standards will be necessary. This will help New Jersey stay at the forefront of energy efficiency in its homes.

Energy Savings or Energy Production

To be determined.

Program Design

The BPU and DCA will develop a method and annual schedule to assess energy efficient performance improvements to appliances. The agencies will use the assessment results to recommend when to adopt new or increase existing appliance standards, and to determine when it would be appropriate to partner with other states to seek regional or federal action on appliance standards.

Costs to Consumers

To be determined.

Savings to Ratepayers

The annual assessment will identify opportunities for additional appliance savings opportunities for New Jersey ratepayers.

Affected Sector(s)

Residential, commercial and industrial.

Administrative Costs

Costs will be covered with existing staff resources and budgets.

Responsible Parties

Board of Public Utilities and Department of Community Affairs.

Timeline of Action

- BPU and DCA to design assessment method, schedule and division of responsibilities by July 2009.
- Conduct first assessment by March 2010.

Source of Funding

Existing agency funding provided to BPU and DCA.

Performance Metrics

- Completion of assessment.
- Establishment of energy efficient performance standards for additional appliances.

Best Practices Manuals and Energy Audits For Local Government and 10 Industry Groups

Strategy Description

The BPU's Energy Ombudspersons will work with organizations like the NJ League of Municipalities and Conference of Mayors to develop a best practices manual for local governments. 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

The BPU will develop a manual for local governments and begin to engage local governments that will in turn help to engage their residents in taking actions to achieve energy efficiency throughout communities. For business, 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 and local government.

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 commenced in 2008 and the first manual will be published in December 2008. 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 Partnership (EEP) comprised of representatives from these sectors: utility organizations, business groups, environmentalists, academia, county/municipal governments, K-12 educators, consumer advocacy groups, and state government.

The EEP's task would be to review existing education efforts in public and private sectors, and recommend a combination of public and private education programs and resources that use an evidence-based, best-practice approach.

Energy Savings or Energy Production

N/A

Program Design

An education and outreach working group to inform the overall education and outreach strategy for the EMP was formed in advance of final adoption of the Plan. This working group was tasked with the responsibility to formulate a report based on four sub-committees: residential; commercial & industrial; institutions and local government; and research. This report will begin to identify key audiences and effective programs, and will be submitted to the EEP to inform its work over the next year. This report is scheduled to be submitted by January 30, 2009.

Through its steering committee, the education and outreach working group will make recommendations to the Governor and/or State Energy Council for appointments to the EEP.

After the Governor and/or State Energy Council reviews the recommendations, an EEP Group will be formed and directed to formulate, within one year, a full 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 EEP will utilize the working group's initial report as a foundation for its work.

The EEP report will:

- Identify key barriers to energy saving and other “green” behaviors and discuss tried-and-tested tactics for overcoming them.
- Include examples of approaches that are effective with target audiences.
- Provide an evaluation of the existing NJ Clean Energy Program Community Partners program as part of this effort. This will include working with the Board of Public Utilities to address barriers to enrollment in the Clean Power Choice Program and to monitor subsequent changes to that process to ensure its effectiveness.
- Propose new education programs or public private partnerships that would effectively promote awareness of New Jersey's energy challenges and lead to “green” behaviors.

In addition, programs proposed must incorporate learning opportunities that will complement green behaviors within the state and improve public education on energy efficiency nationally.

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 (including disadvantaged, non-English speaking and hard-to-reach groups and families);
- Commercial and industrial;
- State and local government.

Administrative Costs

- \$10,000, additional costs for outside research if determined necessary by EEP.

Responsible Party

State Energy Council.

Timeline of Action

- By June 1, 2009, the EEP is formed and begins meeting regularly to begin its work.
- By June 1, 2010, a final report will be submitted to the Governor's Office and State Energy Council.

Source of Funding

Societal Benefits Charge.

Performance Metrics

Timely completion of assigned task.

Expand Participation in Regional Demand Response Programs

Strategy Description

Implement demand response (DR) programs statewide to increase peak load reductions through a variety of programs with greater participation by all customer classes in existing PJM economic and emergency demand response programs and markets.

Energy Savings or Energy Production

Targets for peak load reductions, based on customer usage profiles, will be identified as programs are developed.

Program Design

The Board of Public Utilities should continue to work with stakeholders to identify the need for additional DR incentive programs and to develop new programs, as appropriate, based on continued monitoring of peak levels of electricity use. 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. Beginning in 2008, BPU Staff should 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 should occur in 2009, based on an analysis by the Northeast Energy Efficiency Partnerships (NEEP) to assess cost-effective investments in energy efficiency, demand response and renewable energy opportunities in New Jersey.

As one component of this strategy, the BPU invited those who had previously participated in the state's Demand Response Working Group as well as any new interested parties, to revisit a DR incentive proposal previously submitted to the BPU in 2007. The group came to a consensus on a DRWG Modified Proposal, which BPU Staff submitted to the Board for consideration on October 3, 2008, in an effort to have an incentive program in place by the March 1, 2009 deadline for participation in PJM's Interruptible Load for Reliability ("ILR") Program and for the state's BGS auction year beginning June 1, 2009.

Costs to Ratepayers

Costs will be determined as specific programs are developed.

Savings to Ratepayers

To be determined, based on peak load reductions during peak times and on an annual basis.

Affected Sector(s)

Residential, commercial and industrial.

Administrative Costs

To be determined.

Responsible Party

The BPU will review and oversee DR programs, if ratepayer funds are used to support the programs.

Timeline of Action

- The BPU gathered comments on the DRWG Modified Proposal in early October 2008 and each electric utility is to hold public hearings within its territory by the end of November 2008 so that the Board can consider final proposals in December 2008 in order to allow for program inclusion in the March 2009 RPM auction at PJM.
- Initial recommendations for DR programs targeting customers with peak shares of 1,000 kW and below to be presented in the NEEP Report, to be completed in December 2008.
- BPU evaluation of large C&I customer participation in PJM programs and assessment of whether additional incentives are needed to be completed by third quarter 2009, after the DRWG Modified Proposal Incentive Program has had the opportunity to expand DR activity in the state.

Source of Funding

Depending on specific program design, funding sources may include the Societal Benefits Charge (“SBC”), Regional Greenhouse Gas Initiative (“RGGI”) Charge, BGS, PJM, federal programs and/or private funding.

Performance Metrics

To be included as part of all DR filings with the Board. Any program that leverages or is based on existing PJM programs and/or markets would utilize PJM’s Measurement & Verification protocol, as specified in PJM’s Business Rules.

Utility Load Management Programs 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 state's utilities currently administer demand response programs for residential customers, primarily by cycling central air conditioners. This strategy allows the utilities to expand such programs to commercial and industrial customers. 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; cycling or curtailing other equipment individually designated by the large customer, or any other measure. In addition, the large customers could take other actions to drop load upon receiving signals from their utilities. The demand response should be enrolled in the PJM Demand Side Resource Programs and/or bid into the energy and capacity 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

The BPU and Rate Counsel will work with the utility companies, industry experts, commercial and industrial representatives, and other interested parties, as appropriate, 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 should 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 programs. This would be decided by the Board in consultation with stakeholders and Rate Counsel 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 during peak periods and/or load shifting to hours of less costly electricity pricing. In addition to the individual savings, the benefits to all consumers in New Jersey could be significant, if the programs are effective in lowering the wholesale energy market prices during peak times, reducing capacity and congestion costs, and deferring or avoiding the need for new electricity delivery infrastructure.

Affected Sector(s)

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

Administrative Costs

To be determined.

Responsible Party

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

Timeline of Action

To be determined, in collaboration with the utilities.

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), utility rate recovery as authorized by P.L. 2007, Chapter 340 (the RGGI Act), PJM or the federal government.

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;
- Impact on New Jersey's BGS procurement process;
- DR jobs created; and
- Any other measurement that is deemed relevant and useful to the evaluation process.

Target All C&I Customers with a Peak Demand above 500 kW for Demand Response

Strategy Description

Target all commercial and industrial customers with a peak demand above 500 kW by 2012 to educate and inform them about peak demand and energy consumption reduction incentives provided by PJM and the State.

Energy Savings or Energy Production

To be determined as programs are developed.

Program Design

The BPU Office of the Energy Ombudsperson will develop a listing of State-registered companies that can install and operate demand response equipment at these businesses. All commercial and industrial customers with a peak demand of 500 kW or greater are to be targeted by this office by 2012. The BPU will develop a resource analysis for the Governor's Office within three months of the release of the EMP to estimate the resources that will be required to make this effort a success.

In addition, over the next 6 months, the BPU will develop a report for outlining the demand response best practices in other states, and regions to determine if there are additional incentives that can be made available to these customers to encourage their reduction in peak demand.

The vast majority of New Jersey's electricity customers receive their electricity at a fixed price as set through the yearly BGS auction. Such customers with peak demand below 1,000 kW have no economic incentive to adjust energy use in response to changes in price at the wholesale level. In contrast, customers with a peak demand of 1,000 kW and above must pay real-time electricity prices. As part of this strategy, the BPU will focus on identifying technologies and rate structures that would be most effective at achieving peak demand reduction while mitigating the impact on businesses that may be adversely impacted due to the inability to reduce their peak demand. The BPU will review demand response efforts of customers currently in real-time pricing, examples of successful efforts in other states, and the results of demand response programs involving the electric utilities and curtailment service providers, to determine the best set of incentives and action items to achieve EMP peak demand reduction targets.

Costs to Ratepayers

Cost will depend upon program design.

Savings to Ratepayers

Savings will depend upon a customer's reduced consumption and in which program the company participates.

Affected Sector(s)

Commercial and industrial.

Administrative Costs

To be determined.

Responsible Party

BPU Energy Division and Office of Energy Ombudsperson.

Timeline of Action

- By January 2009, the BPU will provide the Governor's Office with an outline of the resources needed to target all C&I with peak demand above 500 kW by 2012.
- By April 2009, the BPU will develop a listing of State-registered companies that can install and operate demand response equipment on their business premises.
- By April 2009, the BPU will produce a report outlining demand response best practices and incentives utilized in other states.

Source of Funding

To be determined after Governor's Office review of BPU proposal.

Performance Metrics

- Establishment of a list of State-registered companies and a mechanism to annually update the list and develop contact information to perform outreach to all targeted businesses by 2012;
- Issuance of report on best practices and incentives used in other states and regions.
- Number of C&I customers who implement DR annually;
- Amount of peak demand reduction achieved.

Pilot Technology and Rate Structures to Reduce Residential and Small C&I Customer Peak Demand

Strategy Description

The BPU will work with New Jersey utilities to set up a series of pilot programs to determine which technologies and rate structures will be most effective at achieving the State's demand response goals. These pilots will help determine how customer behavior changes with, for example, different rate structures, communications networks, or end-user technologies such as advanced metering infrastructure (AMI). In July 2008, the Board approved JCP&L's Integrated Distributed Energy Resource ("IDER") Pilot Program which is one example of such a program.

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

Technologies such as smart meters and AMI are to be part of these evaluations. Smart meters and AMI are increasingly being used and tested as a means for customers to manage and reduce their energy costs. However, since it is still an early stage technology without a long history, New Jersey will proceed in a manner that allows for testing and evaluation in order to gather data before moving forward with a statewide effort. These technologies will also need to be evaluated based on their interaction with whichever rate structure is determined to be most effective.

As part of the BPU's piloting of rate structures, one of the rate structures that must be considered is "peak" and "off-peak" pricing to provide clear market signals to cut load during peak times, without inundating the consumer with too much information. The BPU should also consider an expansion of inverted block tariff pricing that would charge consumers a higher rate for exceeding a pre-determined electricity usage amount, or for using electricity during a specific time period.

The BPU will work with the Rate Counsel, the electric utilities and consumer groups to design these pilot structures. Regional approaches to the piloting of these technologies may be necessary, and the BPU will look to other states for examples of such pilots. These will need to move forward as quickly as possible in order to allow for a complete dialogue to take place concerning the modernization of the grid described in Goal #4 of the EMP.

Pilot(s) should specifically address the interrelationship of program design with the Basic Generation Service (BGS) procurement process. Special consideration should be given to reducing annual and peak usage to lower electricity costs overall 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.

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 the scope and design of the pilot(s), and on the results from any Request for Proposal (RFP) submissions.

Responsible Parties

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 Rate Counsel.

Timeline of Action

If the pilot(s) do not perform as planned, for any reason, opportunity should be built into the process to allow revisions or discontinuation of specific components of the pilot(s).

- JCP&L's Integrated Distributed Energy Resource Management (IDER) pilot program to provide 8MW of demand response is on track to be operational for summer 2009. The pilot program tests technology that demonstrates the viability of using targeted peak load management to improve system reliability. JCP&L obtained all the necessary residential load equipment and began installations in September 2008 by attaching a load controller on participating residential customers' air conditioning units, and supplying temperature sensors for the customers to plug into electricity sockets within their homes. The C&I portion of the pilot will launch in October 2008 to enroll both small and large C&I customers. JCP&L has the two-way communications network equipment and has selected pole locations the neighborhood data concentrator units. Installation began in October 2008.
- Stakeholder meetings are ongoing for PSE&G's proposed an AMI Technology Evaluation Pilot.
- EDC filings in response to the Board's Order dated July 1, 2008 in Docket No. EO08050326 included proposals for a number of pilot DR programs. Review of the pilots will begin in the second quarter of 2009, (once the process of approving a first set of air conditioning cycling programs is completed in time for summer 2009 implementation), with the intent to have approved pilot programs in place in time for summer 2010 implementation.

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 prudence reviews in a public process. Funding through PJM will be considered wherever feasible.

Performance Metrics

- Peak demand reductions achieved.

- Development of reliable data for decision-making on extending pilots
- Impact on Locational Marginal Prices in the pilot zone during peak times.
- Overall comparison of pilot costs to savings and benefits.
- Other performance metrics, as identified by the collaborative working group.

Monitor Results of Demand Response Strategies through 2012 to Implement the Most Effective Mix to Achieve 5,700 MW Peak Reduction by 2020

Strategy Description

To achieve the total reduction in peak demand of 5,700 MW by 2020, the State will engage in an ongoing assessment of the initiatives outlined in this Plan, and utilize a mix of the best performing programs to achieve the results through 2020. This action step will be revised for the annual Energy Master Plan performance evaluation in the year 2010.

Energy Savings or Energy Production

Savings to be gleaned through implementation of most effective DR programs and strategies.

Program Design

The BPU Division of Energy and Office of Energy Ombudsperson will obtain data from PJM and assess the effectiveness of demand response programs annually following the close of each New Jersey energy year, which coincides with PJM planning periods, and run June 1 through May 31.

Costs to Ratepayers

To be determined.

Savings to Ratepayers

Savings to be gleaned through implementation of most effective DR programs and strategies.

Affected Sector(s)

Residential, commercial and industrial.

Administrative Costs

To be determined.

Responsible Party

BPU Energy Division and Office of Energy Ombudsperson.

Timeline of Action

Annual reports produced September of each year reporting on prior New Jersey energy year (June 1 through May 31).

Source of Funding

BPU budget.

Performance Metrics

- Successful production of annual reports;
- Program recommendations to maximize demand response program investments.

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 rebate (paying approximately 50% of the cost) and SREC approach. The financing system will include an eight-year Solar Alternative Compliance Payment (SACP) schedule. Revise the Renewable Portfolio Standard (RPS) to require 2,120GWh of solar electricity in energy year 2021.

Energy Savings or Energy Production

The RPS will require an increasing amount of solar electricity in each energy year, to reach a goal of 2,120 GWh by energy year 2021.

Program Design

The Board of Public Utilities issued an Order dated December 6, 2007 that specified the decisions to be 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.

On August 7, 2008, the Board issued an order adopting a competitive 15-year long-term contracting approach for a period to cover three full reporting years, plus a partial reporting year if implementation of this approach begins after the beginning of a reporting year. Under this approach, electric distribution companies (EDCs) will enter into long-term contracts to purchase SRECs from solar project customers/developers for part of the new construction required to meet the annual RPS. Prices will be set based on competition among projects divided into classes based upon size. The EDCs would sell the aggregated SRECs to the load serving entities (LSEs) to recover costs associated with contract payouts, and recover from ratepayer funds losses incurred upon resale. The Board believes that this approach supports a transition to non-utility SREC-based financing. The Board did not adopt an expansion of the current PSE&G loan program to support a transition to market-based financing as the overall solution, but has instead agreed to consider PSE&G's modifications to bring the solar loan program into agreement with the elements set out in the August 7, 2008 Order.

The Board will closely monitor the results of the long-term contracting effort, and will obtain periodic reports from Staff regarding the amount of solar electric generation capacity covered by long-term contracts for the purchase of SRECs, the number of SRECs purchased under the long-term contracts, the range of contract prices for each EDC, and various size ranges of solar electric generation systems, the number of sellers to each EDC, and the number of sellers in various size ranges.

Rebates for smaller solar systems with capacity less than or equal to 50 kW will continue in a rebate structure tiered in a declining amount to reflect the lower rebate amount needed for larger projects (greater than 10 kW) within the small project market segment.

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 have been proposed to 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

- Adopt the proposed RPS regulations that place a cost cap on solar incentives but do not adopt the megawatt cap that was proposed by the end of 2008.
- Propose regulations for modification of the Solar RPS to require 2,120 GWh of solar electricity in energy year 2021 by March 2009 with adoption by December 2009. Meetings to discuss the proposed regulations will be held statewide prior to the Board's consideration of the draft rules.
- PSE&G pilot solar program will be implemented between April 2008 and April 2010.
- Approval of utility filings that provide for long term contracts for solar projects will occur by the end of January 2009.

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

Develop New Jersey's wind energy resources, with at least 1,000 MW of offshore wind stalled by 2012, and at least 3,000 MW of offshore wind by 2020. Begin the effort immediately with the development of the Garden State Offshore Energy (GSOE) project for almost 350 MW approved by the BPU on October 3, 2008. Work with the other companies that submitted responses to the offshore wind solicitation to develop other projects that will result in 1,000 MW by 2012. The Board is considering establishing an Offshore Wind meteorological tower rebate program that would support the installation of the towers in 2009.

Energy Savings or Energy Production

The GSOE project would produce almost 350 MW and over 1,000 GWh of renewable energy. When the 3,000 MW is built the total electricity produced per year would be almost 9,500 GWh.

Program Design

The BPU's competitive 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.

Building from these efforts over the past two years, the Governor's Office, the DEP and the BPU will work together to put in place a series of policies that create increased certainty in the regulatory environment that will encourage the free-markets to construct offshore wind projects in environmentally approved areas. To achieve this goal the Governor will establish an Offshore Wind Planning Group that will consist of the DEP, BPU, the Rate Counsel, and public members to develop the necessary plan to guide the development of offshore wind.

This plan is to address both short-term and long-term actions needed to make 3,000 MW of offshore wind a reality. Short-term solutions to consider include regulatory or statutory changes that allow for innovative financing designs that will make offshore wind a reality given today's markets. Long-term strategies to consider include State-sponsored actions that support the development and commercialization of wind technologies that reduce the cost of installing wind turbines, e.g., investments that decrease the cost of wind manufacturing, and investments in research, development and commercialization of new wind technologies.

Costs to Ratepayers

The BPU has authorized \$4 million in project funding to GSOE, available through the New Jersey Economic Development Authority. Funding for meteorological towers that will assist in achieving the 1,000 MW goal by 2012 would be provided through a \$12 million Offshore Meteorological Tower Rebate Program in the 2009 Clean Energy Program Budget. 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.

Affected Sector(s)

Residential, commercial and industrial affected due to the SBC charge.

Administrative Costs

Staff costs are included in the 2008 Clean Energy Program budget and will be included in future budgets.

Responsible Party

- For the GSOE project: NJEDA and BPU with DEP.
- For the Offshore Wind Planning Group: Governor's Office, DEP, BPU and Rate Counsel.

Timeline of Action

- A determination on the GSOE project contract will be made after the offshore wind carve-out rule making is completed (see below).
- The Board will consider an Offshore Wind Meteorological Tower Rebate Program as part of the 2009 Clean Energy Program Budget on December 16, 2008.
- Applications for rebates pursuant to the Meteorological Tower Rebate Program (if approved) that are submitted by December 5, 2008 will be considered by the Board on December 17, 2008.
- Acceptance of permit applications for offshore wind projects will be made after DEP's Baseline Ecological Study is complete, anticipated in the fall of 2009.
- Establish Offshore Wind Planning Group by the end of 2008.
- Commence stakeholder discussions on the possibility of including an offshore wind carve out in the RPS regulations in December 2008. Propose modifications to the RPS regulations needed to support offshore wind development by April 2009 with adoption by September 2009.

Source of Funding

The Clean Energy Program 2008 budget provides the \$4 million in Societal Benefits Charge funds for the GSOE project. An additional \$15 million in funding s for additional activities to promote offshore wind remains available in that budget.

Performance Metrics

- Number of MW of offshore wind;
- MWh of electricity produced by offshore wind facilities;
- MWh 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 statewide 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.

- Economic subcommittee will review incentives available and recommend alternatives where appropriate such as NJ-based behind-the-meter Wind REC among the various RPS carve-outs and aggregated net metering by March 31, 2009.
- Siting subcommittee will review all barriers to siting small wind in New Jersey and recommend an approach and tools such as use of the draft Model Ordinance by March 31, 2009.

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.

Biodiesel

Strategy Description

Mandate 2% biodiesel 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

16.8 million gallons or 2.327 trillion Btu (TBtu) of biodiesel 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 biodiesel use in New Jersey is not old, in South Jersey some 7,000 customers have been using 5% biodiesel 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 47 TBtus. A 5% target of bioheat based on projected 2020 consumption would require some 16.8 million gallons or 2.327 TBtu equivalent of biodiesel. The projected biomass feedstock after diverting it for the 900MW of electric production is in the order of 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 biodiesel and promote biodiesel 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 biodiesel 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 U.S. reach 7.5 billion gallons of biofuel use by 2012. A modest 2% biodiesel 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 biodiesel in the most cost effective manner. The ultimate program design may also consider a societal benefits change on petroleum based fuels to support bio-energy incentive programs and a consumer-based biofuels incentive program.

Costs to Ratepayers

Dependent on the cost of fossil fuel based heating oil. Given oil's recent price volatility it is difficult to predict how long it will take 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 2009, enact biodiesel 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 biodiesel sold in New Jersey.
- Gallons of biodiesel produced in New Jersey.

Biomass-fired Electric Production Capacity

Strategy Description

Develop 900 MW of electric production capacity using biomass resources by 2020.

Energy Savings or Energy Production

Electricity generated would be 6,700 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 30% 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). The EMP is recommending a target of 900 MW of electric production capacity derived from biofuels and

biomass technologies that can be harvested in a sustainable manner without compromising food production. Any biomass facility 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. Concomitantly, conversion of waste into energy will also reduce the need for future landfill development, and consequently reduce the amount of methane, a greenhouse gas, that is emitted from these landfills. Therefore, as part of the BPU's analysis it will consider incentives, including changes to the RPS, that can be put in place to support waste to energy technologies that are more sensitive to the environment than the current methods. However, due to their emissions and inherent inefficiencies, incineration technologies will not be supported as part of this effort.

The BPU staff, working with the DEP staff and the state universities will evaluate the following proposals to stimulate the growth of biofuels in New Jersey and develop a minimum of 900 MW of electric production capacity using bio-energy resources other than incineration by 2020:

- Identify regulatory concerns across permitting agencies to streamline and simplify approval processes.
- Establish bio-energy enterprise zones around concentrations of feedstocks where bio-energy can be strategically utilized.
- Consider modifying the current RPS to support 900 MW of biofuels and biomass other than incineration by 2020.

Costs to Ratepayers

Capital cost (in 2008 dollars) is estimated to be between \$2,500/kW and \$3,500/kW.

Savings to Ratepayers

Providing clean additional sources of in-state 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

- BPU, DEP and the State Universities
- Load Serving Entities

Timeline of Action

- Identify regulatory concerns across permitting agencies to streamline and simplify approval processes by July 2009.
- Establish bio-energy enterprise zones around concentrations of feedstocks where bio-energy can be strategically utilized by December 2009.
- The BPU will develop a strategy for achieving the development of biomass to achieve the following objectives by June 2009, including any needed revisions to the Renewable Portfolio Standard. Any needed revisions would be proposed by July 2009 and adopted by April 2010.

- Develop capacity as follows:
 - 50 MW by 2010;
 - 200 MW by 2015;
 - 900 MW by 2020.

Source of Funding

Renewable Energy Credits, Production Tax Credit, incentives from the Clean Energy Program paid by the Societal Benefits Charge.

Performance Metrics

- Biomass capacity installed by year in MW.
- Biomass energy produced per year in GWh.

Increase Support of Other Renewable Energy Technologies

Strategy Description

In addition to the State's aggressive solar, wind and biofuels goals, policies need to be put in place that encourage the development of other renewable energy technologies such as low head hydro and other new technologies that may emerge such as tidal power. In order to support these technologies, the BPU will consider an RPS "carve-out" model for new and emerging technologies of up to 50 MW a year by 2020. Any alternative compliance payment collected for any new and emerging technologies development that did not happen in a year, will be used to fund the research efforts of the Energy Institute described in greater detail as part of Goal 5 of the Energy Master Plan.

Energy Savings or Energy Production

To be determined.

Program Design

To be determined.

Costs to Ratepayers

To be determined.

Savings to Ratepayers

To be determined.

Affected Sector(s)

Residential, commercial and industrial.

Administrative Costs

To be determined.

Responsible Party

BPU Office of Clean Energy

Timeline of Action

- The BPU will complete a preliminary evaluation by the end of 2009.
- Future updates of the Energy Master Plan will address this evaluation within the state's overall energy context.

Source of Funding

To be determined.

Performance Metrics

Amount of renewable capacity added yearly.

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.

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. Renewable technologies that will be evaluated will include additional offshore and onshore wind, solar and new and emerging technologies.

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 propose regulations in the second quarter of 2009 and adopt by January 2010.

Source of Funding

BPU assessment.

Performance Metrics

Proposed regulations in the second quarter of 2009 and adopted regulations by January 2010; and renewable energy jobs created, reported as operation and maintenance and construction.

Develop Individual Utility Territory Energy Master Plans

Strategy Description

The State will work with the electric and gas utilities to develop individual utility territory master plans through 2020 that effectively respond to the goals and action items in this plan, and provide consumers with additional resources to manage their energy consumption.

Energy Savings or Energy Production

The targets for energy savings through utility programs and actions are 15,300 GWh and 65 Tbtu through 2020.

Program Design

The goals and action items in this plan will significantly impact the current energy infrastructure. Renewable energy technologies, cogeneration development, the need to decrease energy consumption and peak electricity demand, and the possibility of plug in hybrids will alter the demand placed on New Jersey's energy infrastructure. If this infrastructure is not capable of supporting the action items in this plan, then the reliability of the system could be compromised.

To achieve the EMP goals and ensure the continued reliability of the energy system, the State will work with the electric and gas utilities to develop a master plan for each utility territory that will address each of the following key elements of the plan:

1. Energy Peak Load Requirements

Assess the future energy and peak load requirements for each of the state's four electricity utilities for the short term and 2020 timeframe. Project the daily and peak day needs for the state's four natural gas utilities, including the projected natural gas needs for electric power generation through 2020. The utility plans should also present forecasts of future demand by end use sector, accounting for the impact of energy efficiency.

2. Energy Supply

Assess the future energy supply source options for electricity and natural gas while considering the regional PJM market structure for generation and transmission. Identify the necessary upgrades or infrastructure needs to ensure the reliability of the delivery system for electricity (transmission) and natural gas (interstate and intrastate pipelines).

3. Energy Efficiency

Identify the actions needed to ensure that the EMP's energy efficiency targets are met both incrementally and through 2020. The tables below provide projected energy savings targets as well as demand response targets for each electric utility. The targets are based on achieving the same level of savings each year. The utilities can propose different targets based on their plans as long as the total savings for the period through 2020 remains the same. However, the utilities should strive to come close to the annual targets so that early savings can provide maximum benefit. It is envisioned that the Board's approval of the utility master plans will include a requirement to achieve annual savings targets but if not met in one year the ability to make up a short fall in a subsequent year as long as the targets for a four year period are achieved.

EE Savings Allocation										
EXISTING BUILDINGS	Total Savings (GWH)	ACE	JCP&L	RECO	PSE&G	Total Savings (TBTU)	PSE&G	NJNG	ETG	SJG
Heat from CHP										
Commercial 2009-2010						3.97	2.92	0.39	0.3	0.36
2011-2012						3.97	2.92	0.39	0.3	0.36
2013-2016						7.95	5.83	0.78	0.61	0.72
2017-2020						7.95	5.83	0.78	0.61	0.72
2020 Commercial Subtotal						23.84	17.5	2.35	1.83	2.15
Industrial 2009-2010						1.06	0.42	0.05	0.41	0.18
2011-2012						1.06	0.42	0.05	0.41	0.18
2013-2016						2.12	0.84	0.1	0.82	0.35
2017-2020						2.12	0.84	0.1	0.82	0.35
2020 Industrial Subtotal						6.35	2.53	0.29	2.47	1.06
2020 Total CHP						30.18	20.03	2.65	4.29	3.21
Balance Savings obtained through Whole Building Approach										
Residential 2009-2010	1,091	168	368	29	526	3.21	1.98	0.6	0.31	0.32
2011-2012	1,091	168	368	29	526	3.21	1.98	0.6	0.31	0.32
2013-2016	2,183	337	736	58	1,051	6.43	3.95	1.2	0.63	0.65
2017-2020	2,183	337	736	58	1,051	6.43	3.95	1.2	0.63	0.65
2020 Residential Subtotal	6,548	1011	2209	174	3154	19.28	11.85	3.6	1.88	1.95
Commercial 2009-2010	1,305	139	317	31	818	1.88	1.38	0.19	0.14	0.17
2011-2012	1,305	139	317	31	818	1.88	1.38	0.19	0.14	0.17
2013-2016	2,610	277	634	63	1,636	3.76	2.76	0.37	0.29	0.34
2017-2020	2,610	277	634	63	1,636	3.76	2.76	0.37	0.29	0.34
2020 Commercial Subtotal	7,830	832	1903	188	4907	11.29	8.29	1.11	0.87	1.02
Industrial 2009-2010	157	13	39	0.92	104	0.72	0.29	0.03	0.28	0.12
2011-2012	157	13	39	0.92	104	0.72	0.29	0.03	0.28	0.12
2013-2016	314	27	77	1.85	209	1.43	0.57	0.07	0.56	0.24
2017-2020	314	27	77	1.85	209	1.43	0.57	0.07	0.56	0.24
2020 Industrial Subtotal	943	80	232	6	626	4.3	1.71	0.2	1.67	0.72
2020 Total Whole Building Approach	15,321	1,922	4,345	368	8,686	34.88	21.86	4.91	4.42	3.69
2020 Total for Existing Buildings	15,321	1,922	4,345	368	8,686	65.06	41.91	7.56	8.71	6.9
2020%	100%	12.55%	28.36%	2.40%	56.69%	100.00%	64.39%	11.62%	13.39%	10.60%

EE Utilities	2020 Demand Response Allocation	
	MW	
Atlantic City Electric Company	125	13.91%
Jersey Central Power & Light Co	272	30.25%
Rockland Electric Company	20	2.24%
PSE&G	482	53.60%
Total	900	100.00%

Working with the BPU, Rate Counsel and the Governor’s Office, the electric and gas utilities will develop individual utility territory master plans within 12 months of a Board Order that specifies the requirements for the plans. Each plan will not be required to be identical, as the characteristics and challenges of each utility’s infrastructure and customer base is different. Instead, each plan would be reviewed based on its own technical merits and impacts on ratepayers.

Utility plans are to be updated at least every three years to keep up with revisions to the State's energy policy, technology innovations, and changes in consumer behavior. The development of plug-in hybrids is one such example of a technology implementation that may require alterations to the system to accommodate this new demand. Also, technologies such as thermal storage, that support the goals and action items in this plan should also be considered as part of the utilities' master plans. Smart grid technologies will be considered within the broader context of this plan and their abilities to meet the goals and action items in the State's Energy Master Plan.

Costs to Ratepayers

The costs to prepare these master plans are not anticipated to cause an increase in rates.

Savings to Ratepayers

Achieving the savings developed in the EMP will produce billions of dollars in savings to ratepayers over the business as usual scenario.

Affected Sector(s)

Electric and gas public utilities.

Administrative Costs

The Board's costs of reviewing the master plans will be covered by the Board's assessments and is expected to be completed with existing staff with the assistance of consultants as necessary.

Responsible Party

BPU, and NJ Electric and Gas Utilities.

Timeline of Action

- BPU to issue an order requiring preparation and submission of utility territory energy master plans by January 2009.
- First utility plans to be submitted by December 2009.

Source of Funding

Utility funds.

Performance Metrics

Submission of utility plans.

Streamline Cogeneration Permitting

Strategy Description

The State will facilitate the appropriate siting of clean, efficient cogeneration facilities. DEP will adopt a general permit for cogeneration facilities where appropriate.

Energy Savings or Energy Production

N/A

Program Design

The NJDEP will continue to promote clean and efficient cogeneration projects and adopt a general permit for cogeneration facilities. 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

None.

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

- DEP to draft a proposal for a general permit for cogeneration in 2009.
- Other streamlining process efforts 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.

Combined Heat and Power (CHP) Retail Margin Fund Rebate Incentive Program with Pay for Performance

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 report² identified an accelerated market penetration potential of 2,104 MW by 2020, the EMP stakeholder working group recommended a target of 1,500 MW of CHP by 2020. Developing 1,500 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 provide an incentive for 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

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."

higher peaks for the 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 could support 200 MW of installed CHP generating capacity (\$450/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 1,500 MW through 2020 is estimated to be distributed as follows:

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

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 \$450/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 by the BPU in conjunction with the Economic Development Authority (EDA).

Responsible Party

- Legislature
- Board of Public Utilities

Timeline of Action

- Legislation (A2507/S1932) authorizing use of the Retail Margin funds is enacted by January 2009.
- BPU issues solicitations for projects using Retail Margin funds in first quarter 2009.
- Project awards issued within six months after solicitation proposals being received.
- BPU market assessment completed in 2008.
- BPU technical assistance and EDA loans – ongoing program to 2020.

Source of Funding

- 2008-2009: Retail Margin Funds \$60,000,000-\$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.
- CHP/CCHP jobs created, reported as operation and maintenance and construction.

Expand the Definition of Onsite Generation for District Energy Systems

Strategy Description

Expand the definition of “onsite generation facility” found in the Electric Discount and Energy Competition Act (EDECA) to allow cogeneration projects to serve multiple customers and provide tax exemptions to sales of electricity from cogeneration to assist in the development of on-site cogeneration power plants.

Currently, sales of electricity from an “on-site generation facility” to an end user on the same site or to an end user on a contiguous site are exempt from the Sales and Use Tax under *N.J.S.A. 54:32B-8.46*, and from the charges for sale and delivery of power to off-site customers established under *N.J.S.A. 48:3-77*. Cogeneration facilities, which can supply customers with thermal energy (such as heating or cooling) as well as electrical energy, can provide a clean, efficient, and affordable source of energy to customers in a neighborhood or other small geographic area. The on-site generation facility providing thermal energy is connected to those nearby customers by pipes delivering the thermal energy over short distances. This strategy will establish that customers connected to the generation facility by those pipes are considered to be on contiguous properties, so that the sale of energy from the generation facility to those customers is exempt from the Sales and Use Tax, and from the charges for sale and delivery of power to off-site customers established under *N.J.S.A. 48:3-77*. The development of Combined Heat and Power (CHP) in urban areas is particularly important to support State Smart Growth policies by providing efficient clean energy and economic benefits to more densely populated areas. District energy CHP systems are currently constrained to only providing heating and cooling services to customers who are adjacent to the CHP power plant. These same CHP district heating and cooling plants can and do serve customers beyond this definition. These customers should be able to purchase and benefit from the electricity generated concurrently with the heat and cooling they are purchasing.

Energy Savings or Energy Production

See previous strategy for the energy savings and energy production that would result from the CHP program.

Program Design

Work with the Legislature to pass A3339, which provides the changes discussed in the above strategy description.

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 CEEEP. Savings to participating CHP hosts are dependent on size and other factors.

Affected Sector(s)

Residential, commercial and industrial.

Administrative Costs

To be determined.

Responsible Party

- Legislature
- NJ Department of Treasury
- Board of Public Utilities

Timeline of Action

- Legislation (A3339) expanding the definition of onsite generation facility and providing an exemption from the Sales and Use Tax is enacted by December 2009.
- Treasury with BPU assisting to develop recommended tax revisions.

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.

Stakeholder Report to Governor on Nuclear Issues

Strategy Description

The stakeholder group of the State Energy Council (SEC) will issue a report to the Governor on nuclear issues.

Energy Savings or Energy Production

Not applicable.

Program Design

Nuclear energy is another alternative to supplying baseload demand; however there are still several questions and concerns about this technology. Accordingly, the State will charge the stakeholder group of the State Energy Council to issue a report to the Governor about the following issues concerning nuclear energy:

- Waste storage issues,
- Projected growth to baseload demand, including alternative scenarios for the utilization of plug-in hybrid vehicles,
- Available technologies that can environmentally and economically meet baseload demand while not compromising reliability,
- Impacts to ratepayers, and
- The appropriate public outreach process that should be undertaken if the State were to consider approving the construction of a new nuclear plant.

Costs to Ratepayers

To be determined.

Savings to Ratepayers

To be determined.

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 Policy Office

Timeline of Action

- Establish SEC stakeholder group by the end of 2008.
- The stakeholder report will be completed in by end of 2009.

Source of Funding

Not applicable.

Performance Metrics

- The successful conduct of stakeholder meetings and discussions.
- Issuance of a report to the Governor.

Expand the Edison Innovation Fund to Invest in Clean Energy Technologies

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 \$12 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 CEP funding level for 2009-2012 continues to provide \$12 million per year.

NJEDA will partner with the Commission on Science and Technology and devote \$3 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 CEP funding level for 2009-2012 continues to provide \$3 million per year.

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) and New Jersey Commission on Science and Technology (NJCST)
- Board of Public Utilities

Timeline of Action

NJEDA and NJCST will begin implementing these programs in 2008.

Source of Funding

Societal Benefits Charge

Performance Metrics

- Number and amount of incentives issued from the Edison Innovation Funds;
- 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.

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 equipment, design and manufacturing businesses.

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 Department of Labor and Workforce Development (DLWD) and EDA will develop a report on the size and background of energy efficiency companies that are currently operating in New Jersey. The DLWD 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. The Department of Labor and Workforce Development has provided ISLES a grant to develop such a course.

2. Expanding the training at county vocational tech high schools and county community colleges for heating, ventilation and air conditioning (HVAC) 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.

The IWAC should 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 Workforce Development and Green Jobs IWAC;
- New Jersey Department of Education;
- Governor's Office of Economic Growth;
- Economic Development Authority;
- Board of Public Utilities.

Timeline of Action

- The Department of Labor and Workforce Development 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;
- DLWD, 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 second quarter of 2009.

Source of Funding

The Clean Energy Program 2008 budget allocates \$400,000 for a job training pilot. Additional funding may be included in subsequent calendar year budgets as determined necessary.

Performance Metrics

- Timely expansion of DLWD IWAC to include input from EE product and equipment manufacturers;
- Completion of inventory by DLWD 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; and
- Increased number of workers in green collar jobs.

Establish the Energy Institute of New Jersey

Strategy Description

Establish the Energy Institute of New Jersey (EINJ) to support and advance basic and applied energy research at the state's universities and colleges, for technologies that are responsive to the State's efforts to reduce greenhouse gas emissions and ensure the reliability and affordability of the energy environment in New Jersey.

Energy Savings or Energy Production

None directly, however, any energy efficiency or renewable products that emerge from R&D efforts in New Jersey that are used in the state will produce either savings or generation respectively.

Program Design

The EINJ will consist of a board with representatives from the Commission on Science and Technology, the Economic Development Authority, the Commission on Higher Education, the Board of Public Utilities, the Department of Environmental Protection, participating state universities and colleges, and electric and gas utility companies in New Jersey. In addition, representatives from other research institutions (such as the National Renewable Energy Laboratory) and the state's industry leaders in the field of clean energy also will be invited to be members of the EINJ. The EINJ will ensure that appropriate resources are devoted to basic and applied energy research activities by the State's universities and colleges, and that these efforts are coordinated with the State's energy policies. These efforts will help to make New Jersey a national leader for the research, development and deployment (RD&D) efforts that will provide alternative solutions to the energy challenges that currently face the state and nation.

The EINJ board, in its efforts to advance the state's RD&D will develop strategic partnerships between the federal government, national and regional research laboratories, academic institutions, and the state's electric and clean technology industry leaders. The strategic partnerships developed by the EINJ will identify, secure and leverage public and private investments, ensure that research efforts are complimentary where necessary, build upon successful RD&D work at other institutions, develop new ideas, and ensure that the RD&D efforts provides benefits to the state's energy consumers. The EINJ will build on the existing strengths of New Jersey's universities and colleges in the area of clean energy technology research to coordinate their efforts in order to achieve greater impact, by working in concert with New Jersey's energy policy and industry leaders.

The research areas that the EINJ will focus on will be developed in coordination with the State Energy Council and will focus on energy technology developments in:

- Energy Efficiency
- Demand Response
- Advanced Meter and Advanced Grid Technologies
- Renewable Energy
- Energy Storage
- Transmission and Distribution
- Transportation (e.g., plug-in hybrid electric vehicles)
- Other Greenhouse Gas Emission Reduction Efforts

The EINJ will seek to:

1. Develop collaborations between state, regional, national and international entities engaging in research efforts.
2. Provide additional resources to promising research activities that are consistent with the State's energy policy priorities.
3. Incorporate input from entities such as the electric and gas utilities, and other energy industry leaders to identify energy research priorities.
4. Serve as a mechanism for applying for federal research grants and funds from state and private institutions to fund clean energy research being undertaken by collaborations of the represented colleges and universities, and with clean energy businesses.

Costs to Ratepayers

None.

Savings to Ratepayers

The development of New Jersey's science and RD&D capabilities has the potential to yield new energy efficiency and renewable energy technologies and offers the opportunity for savings in the future.

Affected Sector(s)

Residential, commercial and industrial.

Administrative Costs

To be determined.

Responsible Parties

- Commission on Science and Technology,
- Economic Development Authority,
- Commission on Higher Education, the Board of Public Utilities,
- Department of Environmental Protection,
- Participating state universities and colleges, and
- Electric and gas utility companies in New Jersey.

Timeline of Action

To be determined.

Source of Funding

To be determined.

Performance Metrics

To be determined.