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New Jersey Update



Outline

- A little about NJ
- My center – Rutgers – Other NJ Energy Centers
- New Jersey Clean Energy Program
- Energy Master Plan

America's Greenest States



- When you think "green," you think New Jersey, right? OK, maybe not. But perhaps you should.
- The Garden State ranked seventh in our first-ever list of America's Greenest States, a surprise winner amid places synonymous with environmentalism like Vermont, Oregon and Washington.
- More startling: The congested East Coast is a lot more environmentally friendly than you thought
- But:.....

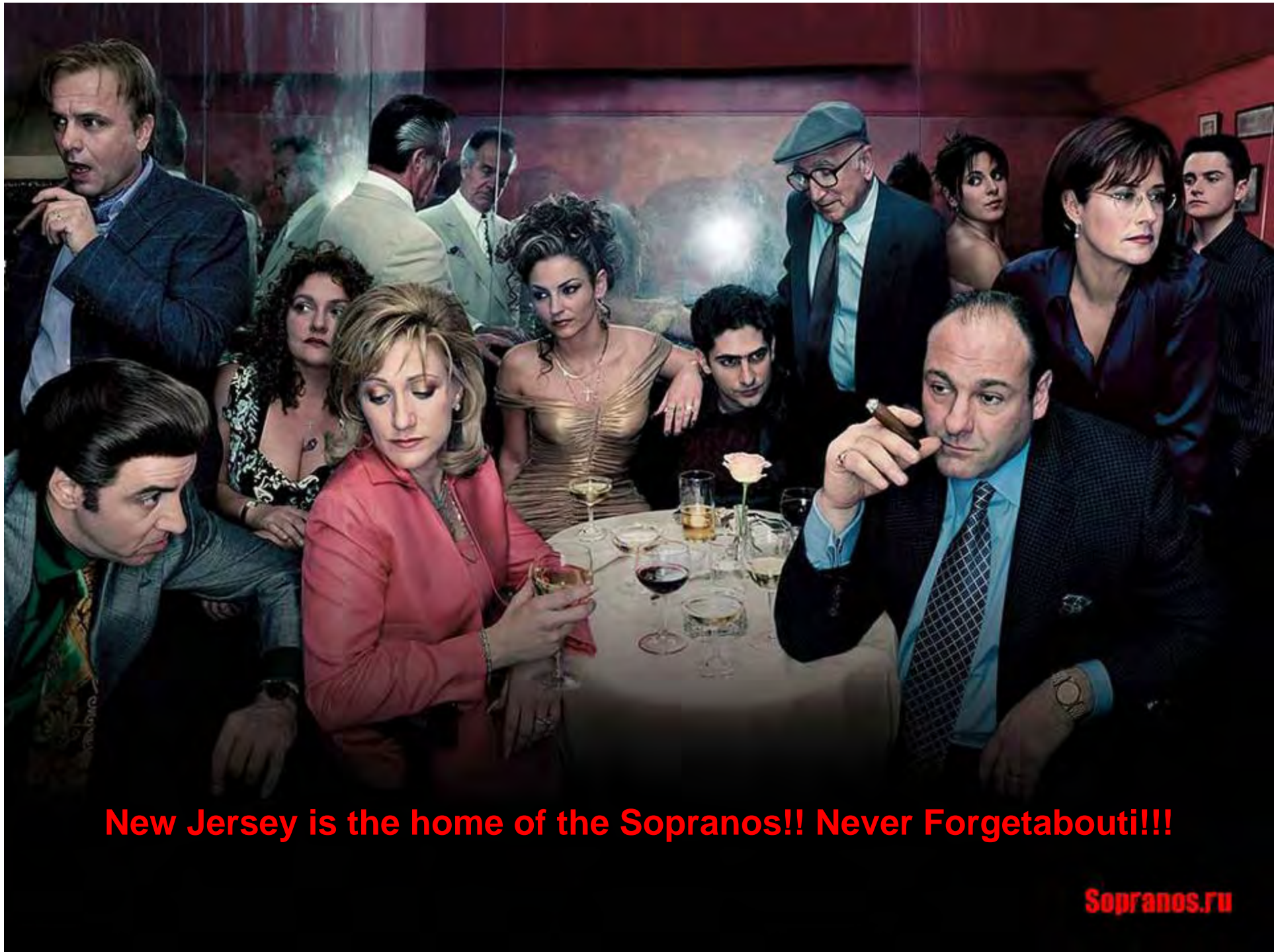


New Jersey Quick Facts

- The New York Harbor area between New York and New Jersey has over 40 million barrels of refined product storage capacity (much of which is in New Jersey), making it the largest petroleum product hub in the United States.
- The largest of the four U.S. Northeast Heating Oil Reserve sites is located in Woodbridge, New Jersey.
- The Salem nuclear power plant is one of the highest-capacity power plants in the Nation.
- New Jersey's Oyster Creek nuclear reactor, which first came online in 1969, is the oldest operating nuclear plant in United States.
- The transportation sector dominates energy consumption in New Jersey, where the average commute time is among the longest in the Nation.

What is New in NJ?





New Jersey is the home of the Sopranos!! Never Forgetabouti!!!

Sopranos.ru

The Center

- *A multi-disciplined, full service center including thrusts in research, teaching, and outreach in response to an emerging national emergency, fertile opportunities for important advances in technology and significant student interest.*



<http://caes.rutgers.edu>

Key Players



Michael R. Muller
Professor & Director



Donald Kasten
Manager of Technical
Operations



Jill Mesonas
Chemical Engineer
& Center Admin



Michael B. Muller
Mechanical Engineer
& IT Manager



Joshua Kace
Mechanical Engineer



Sachin Nimbalkar
Graduate Student



Prakash Rao
Graduate Student



Malik Khan
Graduate Student



Blake Boyer
Graduate Student



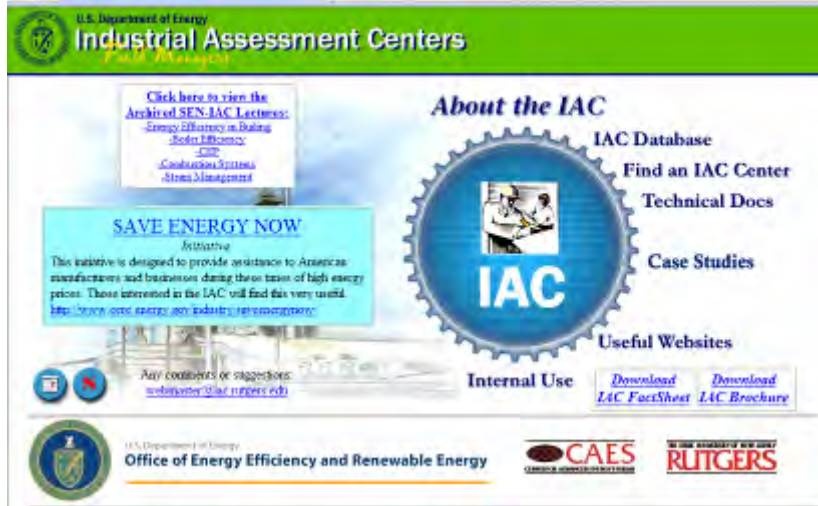
Sara Salehi
Graduate Student



Sponsors



Technical Assistance



U.S. Department of Energy
Industrial Assessment Centers

Click here to view the Archive of IAC Fact Sheets: Energy Efficiency in Buildings, Safety Efficiency, CIP, Conditioned Systems, Steam Management

SAVE ENERGY NOW Initiative
This initiative is designed to provide assistance to American manufacturers and businesses during these times of high energy prices. Those interested in the IAC will find this very useful.
<http://www.eere.energy.gov/industry/initiatives/>

Any comments or suggestions: webmaster@iaac.rutgers.edu

About the IAC

- IAC Database
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U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy

CAES
CENTER FOR ADVANCED ENERGY SYSTEMS

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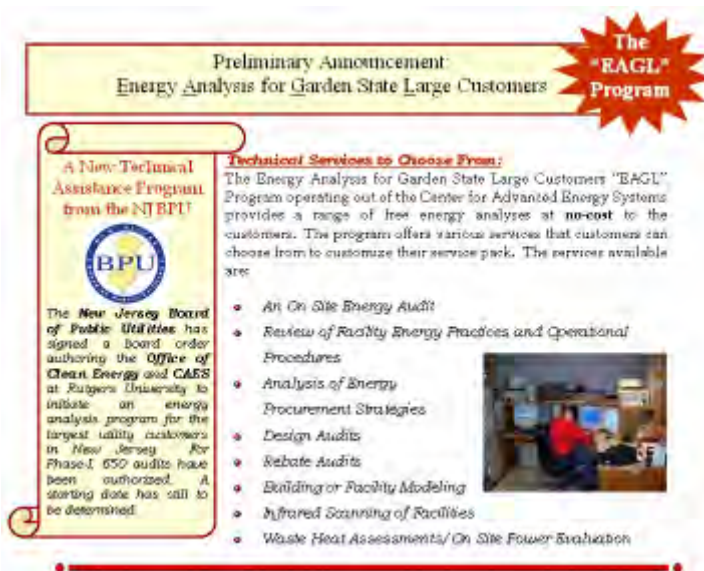
U.S. Department of Environmental Protection

News & Events | NJDEP Information

CAES Engineers in process at 2007 ASERC Summer Study on Energy Efficiency in Industry

Publication Prevention & Right To Know | Compliance & Enforcement

Get your FREE assessment!



The "BAGL" Program

Preliminary Announcement:
Energy Analysis for Garden State Large Customers

A New Technical Assistance Program from the NJBPU


BPU

The New Jersey Board of Public Utilities has signed a board order authorizing the Office of Clean Energy and CAES at Rutgers University to initiate an energy analysis program for the largest utility customers in New Jersey. For Phase-I, 650 audits have been authorized. A starting date has still to be determined.

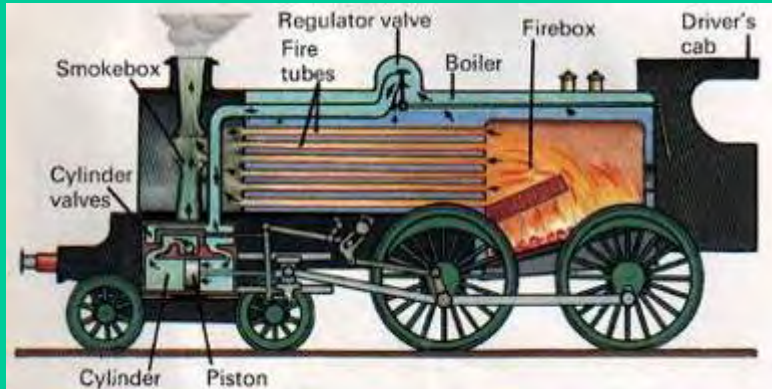
Technical Services to Choose From:

The Energy Analysis for Garden State Large Customers "BAGL" Program operating out of the Center for Advanced Energy Systems provides a range of free energy analyses at **no-cost** to the customers. The program offers various services that customers can choose from to customize their service pack. The services available are:

- An On Site Energy Audit
- Review of Facility Energy Practices and Operational Procedures
- Analysis of Energy Procurement Strategies
- Design Audits
- Rebate Audits
- Building or Facility Modeling
- Infrared Scanning of Facilities
- Waste Heat Assessments/ On Site Power Evaluation




NJCHP
Combined Heating & Power



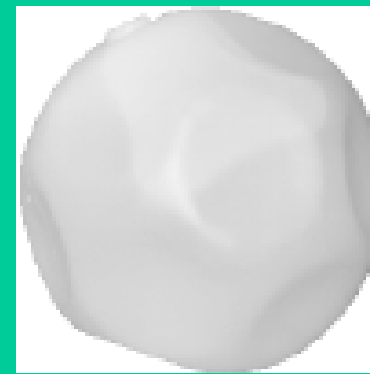
Novel Steam Engine Applications



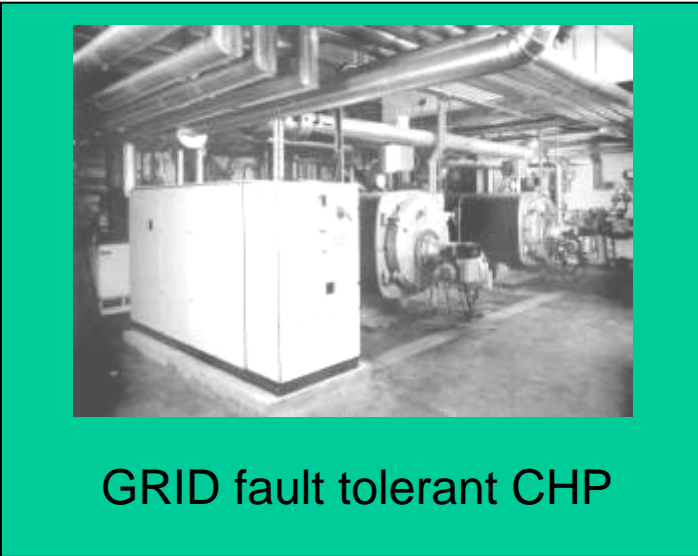
Vortex Tube Applications



Impact of Environmental Dispatching



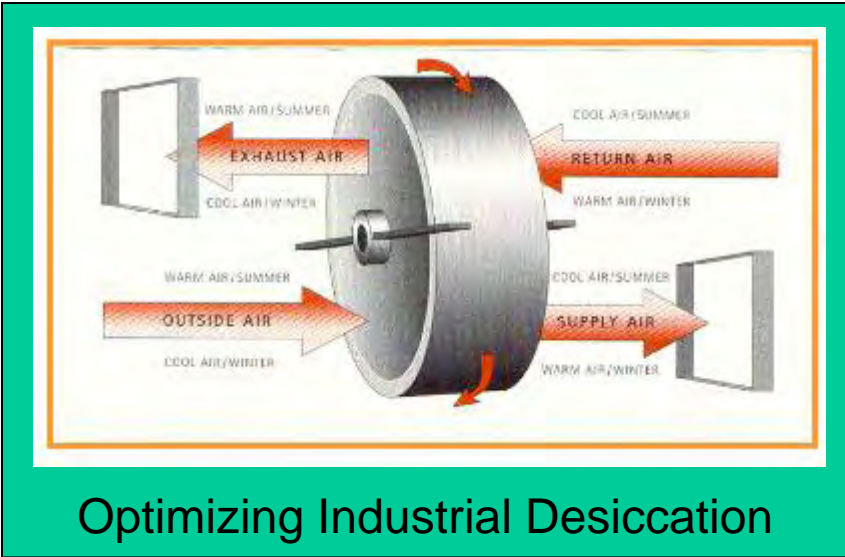
Condenser Buffers



GRID fault tolerant CHP



GRID Cyber Security



Optimizing Industrial Desiccation



PSA in Fluidized Beds

Two Other Centers at RU



What is this????



Rutgers University Energy Institute

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Faculty at Rutgers Energy Institute

Acting Director	Paul Falkowski	
Associate Director	Monica Mazurek	
Advisory Board	Clinton J. Andrews	Dunbar P. Birnie III
	Frank A. Felder	Eric L. Garfunkel
	Alan Goldman	Michael T. Klein
	Jerry J. Kukor	Joachim Messing
	David Specca	Lily Y. Young

The Clean Energy Program

- Started in 2003 with SBC monies
- Troubles at the start with where to put the money (really and programmatically)
- Focus had been on solar
- Energy efficiency programs are normally undersubscribed



Clean Energy Program

Table 1: Budgets and Expenditures

Summary of Statewide Results as of December 31, 2006				
Budget and Expenditures				
(000s)	<u>Budget</u>	<u>Actual</u>	<u>Expenses</u>	
			<u>Committed</u>	<u>Total</u>
Energy Efficiency (EE)	\$128,645	\$79,642	\$60,233	\$139,875
Renewable Energy (RE)	\$170,562	\$84,279	\$103,901	\$188,179
OCE Administration	\$9,907	\$7,276		\$7,276
Total	\$309,114	\$171,197	\$164,134	\$335,330

Table 2: Energy Efficiency Program Budgets and YTD Expenses

Summary of Statewide Results as of December 31, 2006 Energy Efficiency Program Budgets and YTD Expenditures					
(000s)	Program	Budget	Expenses		
			Actual	Committed	Total
RESIDENTIAL PROGRAMS					
	Residential HVAC-Electric and Gas	\$16,705	\$14,849		\$14,849
	Residential New Construction	\$27,720	\$19,728	\$42,932	\$62,660
	ENERGY STAR Products				
	Maintenance	\$1,054	\$606		\$606
	Room AC	\$875	\$481		\$481
	Change a Light & Other	\$1,320	-\$68		-\$68
	On Line Audit	\$870	\$395		\$395
	Home Performance with ENERGY STAR	\$3,595	\$1,952		\$1,952
	Residential Low Income				
	Utility Comfort Partners	\$21,330	\$16,557		\$16,557
	WRAP	\$200	\$0		\$0
	DCA Low-Income	\$3,725	\$1,652		\$1,652
	DCA Green Homes	\$1,600	\$0		\$0
	Energy Conservation Kits	\$607	\$371		\$371
	Sub-Total: Residential Programs	\$79,601	\$56,524	\$42,932	\$99,456
COMMERCIAL & INDUSTRIAL PROGRAMS					
	Commercial/Industrial Construction				
	C&I New Construction	\$3,811	\$1,422	\$1,463	\$2,885
	C&I Retrofit	\$25,180	\$16,973	\$8,178	\$25,151
	New School Construction & Retrofit	\$3,872	\$1,672	\$1,113	\$2,786
	Combined Heat and Power	\$6,681	\$1,875	\$4,429	\$6,304
	Sub-Total: C&I Programs	\$39,544	\$21,943	\$15,183	\$37,126
OTHER PROGRAMS					
	Special Studies	\$1,000	\$52		\$52
	NJDEP Cool Cities	\$4,000	\$1,123	\$2,118	\$3,241
	Treasury HVAC	\$4,500	\$0	\$0	\$0
	Sub-Total: Other Programs	\$9,500	\$1,175	\$2,118	\$3,293
	TOTAL Energy Efficiency Programs	\$128,645	\$79,642	\$60,233	\$139,875

Table 3: Renewable Energy Program Budgets and YTD Expenses

Summary of Statewide Results as of December 31, 2006 Renewable Energy Program Budgets and YTD Expenditures				
(000s)				
Program	Budget	Actual	Expenses Committed	Total
OCE RENEWABLE PROGRAMS				
Customer On-Site Renewable Energy (CORE)	\$148,796	\$82,723	\$95,233	\$177,955
CleanPower Choice	\$1,933	\$1,150	\$0	\$1,150
Sub-Total: OCE Renewable Programs	\$150,729	\$83,873	\$95,233	\$179,105
EDA RENEWABLE PROGRAMS				
Manufacturing Incentive	\$30	\$6	\$0	\$6
Public Entity Financing (RE)	\$6	\$6	\$0	\$6
Clean Energy Financing for Businesses	\$15	\$29	\$0	\$29
RE Project Grants and Financing (Incl. NJBPU)	\$11,782	\$203	\$7,956	\$8,159
Renewable Energy Business Venture	\$8,000	\$162	\$712	\$874
Sub-Total: EDA Renewable Programs	\$19,833	\$406	\$8,668	\$9,074
TOTAL Renewable Energy Programs	\$170,562	\$84,279	\$103,901	\$188,179

Solar Mess

- Rebate levels are too high
- Queue for rebates exceeds yearly budget

Report B4: 2007 Budget Status							
Budget Categories	Revised 2007 Budget as Approved by the Board 8/1/07	Amount Paid 2007 YTD (From Report B1)	2007 Remaining Budget	Outstanding Rebate Commitments (From Report B2)	2007 Uncommitted Funds (Available For Additional Rebate Approvals)	Rebate \$ Amount in Queue (From Report B3)	Amount Remaining in Queue after Committing Available Funds
	(A)	(B)	(C) = (A) - (B)	(D)	(E) = (C) - (D)	(F)	(G) = (F) - (E)
<=10kW Private	\$ 39,202,000	\$ 12,316,000	\$ 26,886,000	\$ 26,509,034	\$ 376,966	\$ 32,845,418	\$ 32,468,452
>10kW Private	\$ 62,500,000	\$ 25,837,910	\$ 36,662,090	\$ 30,069,730	\$ 6,592,360	\$ 81,567,049	\$ 74,974,689
Public- Non Schools	\$ 23,610,000	\$ 5,394,441	\$ 18,215,559	\$ 17,098,679	\$ 1,116,880	\$ 12,713,392	\$ 11,596,512
Public Schools K-12	\$ 16,900,000	\$ 4,981,026	\$ 11,918,974	\$ 9,008,981	\$ 2,909,993	\$ 2,423,486	
SUNLIT	\$ 6,000,000	\$ 264,493	\$ 5,735,507	\$ 2,254,102	\$ 3,481,405	\$ 388,625	
Total All RE Projects	\$ 148,212,000	\$ 48,793,870	\$ 99,418,130	\$ 84,940,526	\$ 14,477,604	\$ 129,937,969	\$ 119,039,652

Solar RECs – a solution?

- Good for 1MWH of solar
- Providers not meeting RPS must pay \$300 per MWH – puts cap on price
 - But – what does NJ do with the \$300?? And the Retail Adder money?? Ask Tony Soprano

Solar REC's – a solution?

Current SREC Trading Statistics, Through August 2007

Reporting Year 2007 (for production between June 1, 2006 – August 31, 2007)

Month	Year	Active kw DC	# SRECs Issued in Month	# SRECs Traded in Month	Monthly High (\$/MWh)	Monthly Low (\$/MWh)	Cumulative # SRECs Traded	Cumulative Weighted Average Price (\$/MWh)
August	2007	38,861.17	541	8913	\$250	\$88	53932	\$220.28
July	2007	38,670.88	1066	9851	\$265	\$150	45019	\$221.27
June	2007	37,934.50	8239	17463	\$297	\$110	35168	\$218.62
May	2007	35,738.462	5493	3375	\$265	\$150	17705	\$217.96
April	2007		2479	2527	\$265	\$150	14330	\$214.75
Mar	2007		2127	1828	\$265	\$150	11803	\$208.65
Feb	2007		1744	3067	\$265	\$110	9975	\$205.65
Jan	2007		1194	1557	\$265	\$115	6908	\$204.03
Dec	2006		1681	2750	\$260	\$110	5351	\$195.44
Nov	2006		1820	1022	\$260	\$110	2601	\$197.89
Oct	2006		2622	464	\$250	\$160	1579	\$205.99
Sept	2006		1426	747	\$255	\$174	1115	\$206.08
Aug	2006		1597	131	\$235	\$150	368	\$213.77
July	2006		1226	237	\$240	\$150	237	\$218.60
	Total		33,255	53,932				



- Opportunity to Support Renewable Energy
In April of 2006, the Board of Public Utilities announced the launch of the Clean Power Choice program which provides an opportunity for state residents to elect to use renewable energy.

16) Off Shore Wind - New Jersey

The New Jersey Board of Public Utilities requests proposals for 350 MW of Off-Shore Renewable Energy Facilities Serving New Jersey. The financial incentive would be provided via a production incentive paid out over 5 years. Up to \$19 million expected to be available.

Responses due 1/16/08. For more info, contact Alma Rivera at alma.rivera@bpu.state.nj.us or go to: <http://www.njcleanenergy.com/library/grants-and-solicitations/grants-and-solicitations>. (Green Power Network 10/17/07)

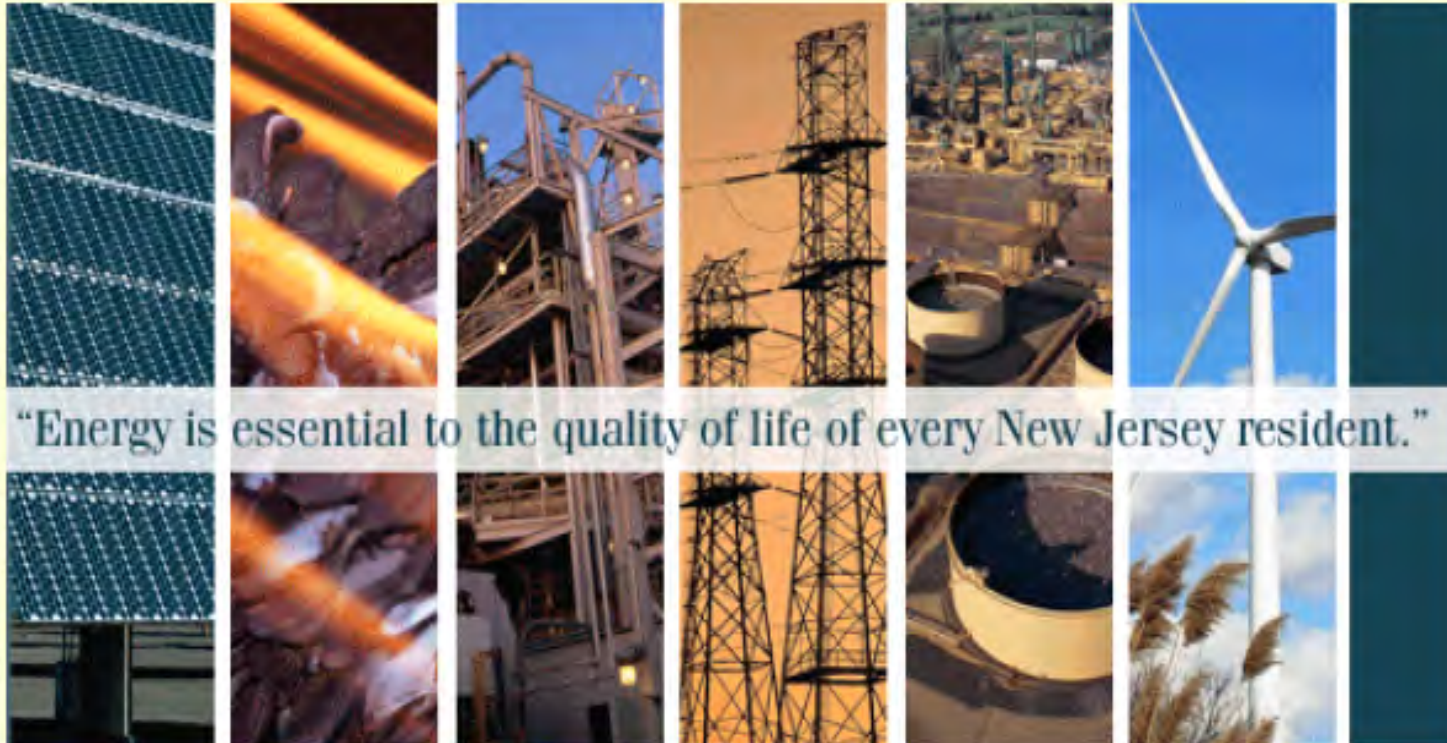


TABLE 1: CHP INCENTIVE PROGRAM TECHNOLOGY AND INCENTIVE LEVELS

- Have moved away from proposal based funding
- Cooling ups level 2 to 40%
- Funding for 18 months from award letter – can only be paid when operational

Eligible Technology ⁽¹⁾	Incentive ⁽²⁾ (\$/Watt) (Up to 1.0 Million)	Maximum % of Project Cost	Minimum System Size
<p>Level 1</p> <ul style="list-style-type: none"> ● Fuel cells not fueled by Class I renewable fuel. 	<p>\$4.00/W*</p> <p>*For Fuel Cells: Incentives will not exceed \$1 Million per applicant</p>	60%	None
<p>Level 2</p> <ul style="list-style-type: none"> ● Microturbines ● Internal Combustion Engines ● Gas Combustion Turbines 	\$1.00/W	30% ⁽³⁾	None
<p>Level 3</p> <ul style="list-style-type: none"> ● Heat Recovery or Other Mechanical Recovery Electric Generation Equipment 	\$0.50/W	30%	None

New Jersey's Energy Master Plan



Energy Master Plan

- Due out shortly (required every 5 years)
- Included input from a large number of government agencies
- Will not have any teeth – but should accurately reflect the Governor’s priorities

"Global Warming Response Act"

- The Governor has signed legislation to adopt proactive and ambitious goals for the reduction of greenhouse gas emissions in New Jersey -- to
 - stabilize greenhouse gas emissions to 1990 levels by 2020, a 20 percent reduction
 - further reduction of emissions to 80 percent below 2006 levels by 2050.
 - Under the new law, all electricity imported here from other states will have to meet New Jersey's rigorous emission standards.
- New Jersey is only the third state in the nation to make such a law.



"Global Warming Response Act"

The Star-Ledger

No teeth in 'tough' pollution law

Sunday, October 07, 2007

BY BILL WOLFE

- The final version of the bill eliminated provisions that were designed to fund a series of programs to implement the emissions reduction goals.
- The law -- contrary to widespread media coverage -- does not legally cap greenhouse gas emissions or mandate emissions reductions on any major pollution sources.
 - As a result, the law's theoretically "mandatory" goals are unenforceable and therefore a fiction.
- Specifically, the law provides no regulatory authority, funding or staff for the DEP to take the necessary steps to implement and enforce the emission reduction goals.

Working with Other States to Reduce GHG Emissions

- The Corzine Administration has taken a leadership role in the Regional Greenhouse Gas Initiative (RGGI), a 10-state cooperative effort to implement a regional mandatory cap and trade program in the Northeast and Mid Atlantic to address carbon dioxide emissions from power plants.
- The first mandatory market-based program to reduce carbon emissions in the U.S., the program will cap regional power plant carbon dioxide emissions at approximately current levels from 2009 through 2014 and reduce emissions 10 percent by 2019.

Leading Nation in Renewable Energy Mandates

- On April 12, 2006, the NJBPU expanded the State's Renewable Portfolio Standard (RPS) by
 - Under the newly adopted regulations, 20 percent of New Jersey's electricity must come from renewable sources by 2020.
 - Mandate that 2-percent of that renewable energy be generated from solar sources which is the nation's largest solar commitment relative to population and electricity consumption.

ENERGY AUCTION GENERATES SAVINGS

- So far the Office of Energy Savings has secured \$2 million in net cost savings, which will be realized over the next three years from the new State energy supply contracts.
- The bid resulted in pricing that is 1.15 percent lower than existing contract prices. The new, aggregate volume weighted price is \$0.099472 per kilowatt hour, versus the current volume weighted price of \$0.100629.
- The power will also include an increasing amount of renewable supply in compliance with New Jersey's renewable portfolio standard,
 - electricity supply purchases from renewable sources would grow from 5.5 percent in the first year of the contract to 6.5 percent in the second year and 7.4 percent by the third year.

EMP – New Power Authority

- Putting the genie of deregulation back in the bottle
- A key -- and potentially most controversial -
- recommendation of the EMP
- Since deregulation prices are up, with
reduced generating capacity
 - Somebody is making money!

Final Thoughts

- Despite internal troubles, NJ is doing a good job
- Our reputation is changing
- Still best to remember the Sopranos when doing business

