

New Jersey 2020 Project Strategic Overview of Energy Efficiency Portfolio

August 12, 2008

Presenters:

- Sue Coakley
- Eric Belliveau
- David Hill
- Blair Hamilton
- Patti Doyle



Northeast Energy Efficiency Partnerships, Inc.

New Jersey 2020 Project

Topics

- Purpose of EE Strategy Overview
- Core Concepts
- Strategy Map
- Strategy Elements
- Scaling Up
- Initial 2009 Recommendations



New Jersey 2020 Project

NJ Master Plan Energy Efficiency Goal

GOAL 1: Maximize the State's energy conservation and energy efficiency to achieve reductions in energy consumption of at least 20% by 2020.

- ACTION ITEM 1: Redesign and enhance the State's current energy efficiency programs to achieve the desired results while remaining cost-effective
- ACTION ITEM 2: Work with the Legislature to authorize the development of statewide building codes to result in new construction being at least 30% more energy efficient than current state code by July 2009
- ACTION ITEM 3: Work with the Legislature to set minimum energy efficiency standards for new appliances and other types of equipment currently not covered by existing standards by 2009
- ACTION ITEM 4: Increase education and outreach in the public and private sectors



New Jersey 2020 Project

Why Strategy Overview?

- ❑ Provide conceptual approach to redesign of EE programs
- ❑ Engage discussion of elements
- ❑ Get feedback → inform development
- ❑ Recommend priorities for 2009 planning and implementation
- ❑ Relate strategies to recommended administrative structure



New Jersey 2020 Project

Core Concepts

Go deeper, broader, *faster...*

- ✓ Aggressive, consistent statewide effort
 - No lost opportunities left behind
 - Drilling into retrofit → deep reservoirs of savings
- ✓ Utilities as program administrators → procure savings, build market ***momentum***
- ✓ Flexible, responsive programs → results oriented
- ✓ Engage full market chain → upstream, downstream
- ✓ State and local policies as core components
- ✓ Community partnerships to engage public
- ✓ Expand financial resources → SBC + market-based financing, on-bill financing, capacity market values



New Jersey 2020 Project

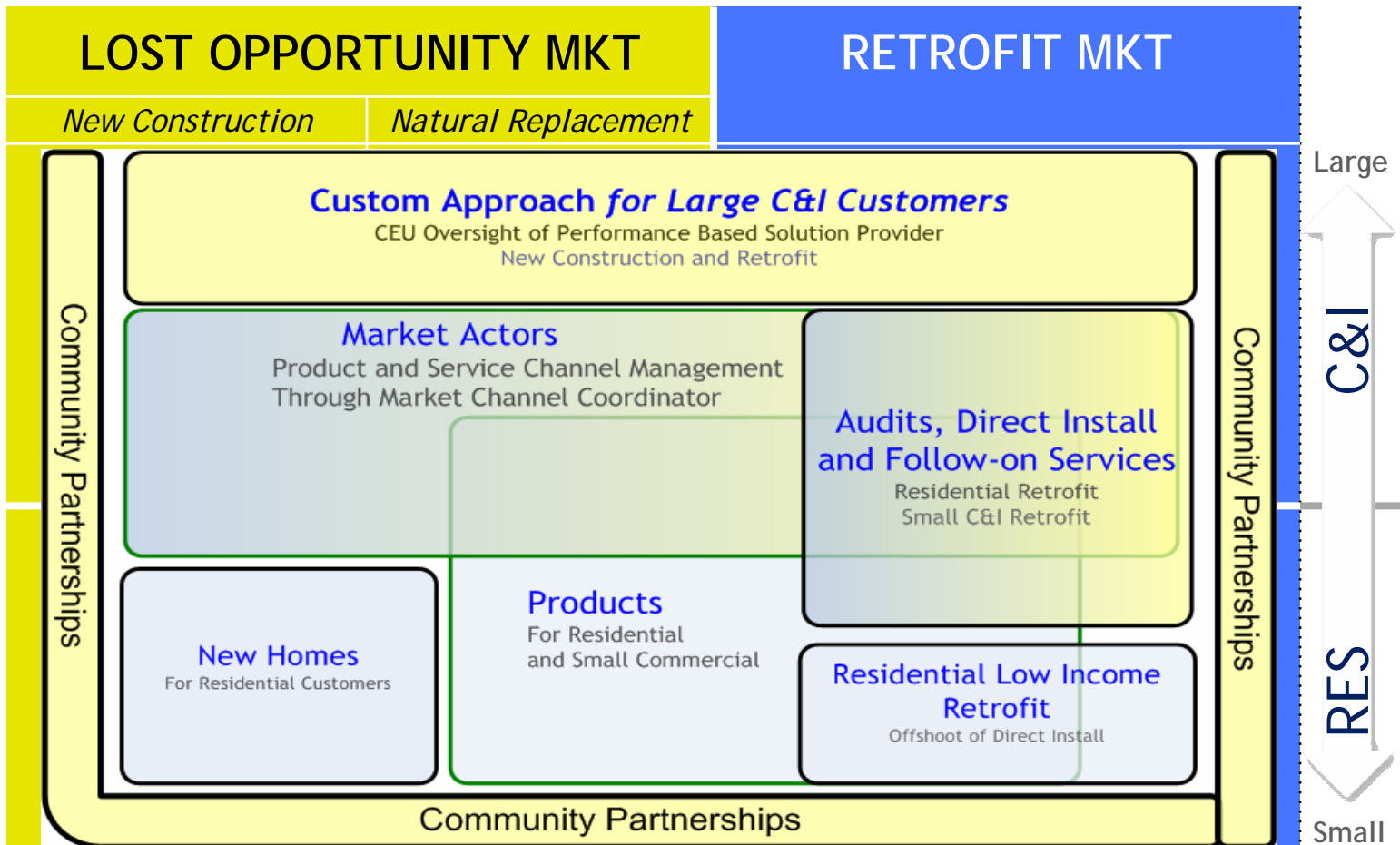
Strategy Overview

- New Buildings
- Existing Buildings
- Things in Buildings
- Buildings as Power Source
- Connecting Buildings
- Human Behavior
- Connecting People
- Scaling-up
- Innovating
- Developing Capacities



New Jersey 2020 Project

Program Map



New Jersey 2020 Project

Public Policies

Regulation to Pull up the Baseline

- Progressive Building Energy Codes
- State Appliance Standards
- Building Energy Ratings – time of sale disclosure by 2012, minimum building efficiency performance by 2015

The Market Pull of State Procurement

- Energy ratings and energy performance required for all state facilities by 2012
- High Performance Energy requirements for all state-funded construction (e.g., Collaborative for High Performance Schools)
→ moving to carbon neutral by 2020
- Continually update efficiency specs for state purchasing

Rate Design to Reward Efficiency, Peak Reduction

- Time-of-use rates, inverted block rates, etc.



New Jersey 2020 Project

New Buildings *Concept*

Adopt Architecture 2030 Goals of Carbon Neutrality for all new buildings by 2030. Establish codes and rating requirements that incrementally lower carbon foot print of all new construction.

Moving to Carbon Neutrality

Existing

- ☑ State building energy code – 30% above current (**pending**)
- ☑ Incentives and design assistance → exceed energy code
- ☑ Commissioning for commercial, HERS rating for residential

plus NEW!

- Optional “stretch code” appendix – more stringent than base code:
 - ★ Basis for ratepayer funded programs and state-funded construction
 - ★ For municipal adoption by leading communities
- Above code program address **all fuels** – **available statewide**
- Mandatory energy performance building ratings – **all sectors**
- Link to CHP and customer-sited renewable energy programs
- Smart metering (2-way communication, enable DR)
- Rate design to encourage energy management and smaller homes



New Jersey 2020 Project

Residential New Buildings

Adopt Architecture 2030 Goals of Carbon Neutrality for all new buildings by 2030. Establish codes and rating requirements that incrementally lower carbon foot print of all new construction.

Residential Sector “*Tool Box*”:

Existing

- ☑ Design assistance → achieve or exceed stretch code
- ☑ Builder training and certification/accreditation
- ☑ Incentives -performance-based plus appliances/lighting
- ☑ Link to financing (e.g., energy efficient mortgages)
- ☑ HERS Rating compliance verification → open-market HERS structure to being in 2010 implementation

plus NEW!

- Energy efficiency beyond **Energy Star**
- Aggressive marketing and sales
- Customer and community education



New Jersey 2020 Project

Commercial New Buildings

Adopt Architecture 2030 Goals of Carbon Neutrality for all new buildings by 2030. Establish codes and rating requirements that incrementally lower carbon foot print of all new construction.

Commercial-Institutional-Industrial Sector "*Tool Box*":

Existing

- ☑ Technical Assistance -design assistance w/ project modelling
- ☑ Incentives (construction *and* equipment replacement)
 - ★ Equipment incentives – prescriptive, custom, multi-measure bonus

plus NEW!

- Strategic marketing to reach all new construction and renovation
- Large Customer - 200kW or top 10% - negotiated incentives overcome barriers by sector, industry, building type (e.g., 2 yr buy down)
- Compliance Verification → commissioning + building energy ratings
- Special outreach strategy to data centers
- Upstream co-promotions for new/replacement equipment and lighting
- Introduce solid state lighting and DOE Commercial Lighting Solutions



New Jersey 2020 Project

Existing Buildings *Concept*

Reduce building and home energy consumption by 30% by 2020 – all fuels. Time-of-sale energy performance ratings required 2015.

Efficient, intelligent homes and buildings

Existing

- ☑ Capture all cost-effective efficiency in each home and building (focus on low-income, small C&I)

plus NEW!

- All fuels, all sectors
- Market-based service providers for each sector + sub-sector
- Building energy performance ratings:
 - ★ Require rating at time of sale (TOS) for all buildings by 2012
 - ★ Require TOS minimum energy performance rating by 2015
- Links to consumer products, data centers, O&M services
- Rate design to encourage energy management
- Community partnerships to engage participation



New Jersey 2020 Project

Existing *Residential* Buildings

Reduce building and home energy consumption by 30% by 2020 – all fuels. Time-of-sale energy performance ratings required 2015.

Residential Sector “Tool Box”:

Existing

- ☑ Comprehensive low-income program – all fuels
- ☑ Reduced cost on-site home energy analysis by certified inspectors
- ☑ Whole house low interest financing or cash back incentive
- ☑ Equipment incentives (HVAC, lighting) + HVAC installation requirements
- ☑ Cooperative upstream market partnerships → high efficiency lighting

plus NEW!

- All fuels – add oil heat efficiency
- Direct-install house air-sealing, duct-sealing, CFLs
- Home energy rating service – all homes
- More cooperative upstream promotions (HVAC, appliances)
- Old appliance removal, disposal
- More on-line tools and track for “do-it-your-selfers”



New Jersey 2020 Project

Existing *Commercial* Buildings

Reduce building and home energy consumption by 30% by 2020 – all fuels. Time-of-sale energy performance ratings required 2015.

Commercial-Institutional-Industrial Sector "Tool Box":

Existing

- ☑ Direct install for small commercial – ***all cost-effective measures***
- ☑ Equipment replacement incentives – prescriptive and custom

plus NEW!

- **Sector and industry-specific services and assistance – all fuels**
- Direct customer management with team approach w/ link to qualified private market firms for:
 - ★ Analysis, screening, design assistance
 - ★ Equipment and construction/installation
 - ★ Commissioning, retro-commissioning, building energy ratings
 - ★ Building energy management services
- Flexible financing and custom incentives to overcome market barriers
- Links to plug-ins, renewable energy and CHP programs



New Jersey 2020 Project

Things in Buildings: *Concept*

Market pull for next generation “plug-in” smart products, lighting and appliances. Build market demand. Lock in market gains with mandatory appliance standards.

Efficient, intelligent end-uses

Existing

- ☑ Energy Star, NEMA premium for established products
- ☑ Appliance standards for broadly available products
- ☑ Upstream co-promotions for CFLs

plus NEW!

- Shift focus to solid state lighting – transition from CFLs
- Market-driven premier tier (e.g., TopTen List USA)
- Encourage break-through technologies (research, pilots)
- Support intelligent technologies (e.g., chip-based controls)
- Upstream co-promotions – broad range of products
- Participation in - leadership for national and regional efforts
- Research-support specs for future new appliance standards



New Jersey 2020 Project

Things in Buildings

Consumer Products

Market pull for next generation “plug-in” smart products, lighting and appliances. Build market demand. Lock in market gains with mandatory appliance standards.

Consumer Products Strategy Tool Box:

Existing

- ✓ CFLs, room AC, dehumidifiers, clothes washers
- ✓ Selective rebates – some upstream co-promotions (CFL)
- ✓ Retailer support for Energy Star

plus NEW!

- **More products!** TV, electronics, appliances, smart plug strips
- **More upstream co-promotions** - availability, high profile messaging
- Focus incentives on premier tier (e.g., TopTen)
- Incentives for high efficiency product packages with energy management controls (home theatre, office, etc.)
- Integrate with strategies for new and existing homes
- Regulate set-top box efficiency standards – **state and local**



New Jersey 2020 Project

Things in Buildings

Commercial Sector

Market pull for next generation “plug-in” smart products, lighting and appliances. Build market demand. Lock in market gains with mandatory appliance standards.

Commercial Sector Products Strategy Tool Box:

Existing

- ☑ Incentives for premium motors/drives, water heaters

NEW!

- Multi-faceted education and incentive programs for:
 - ★ Data centers
 - ★ Office equipment, IT systems
 - ★ Commercial and institutional kitchens
 - ★ Laboratory and medical equipment
- Upstream co-promotions - availability, high profile messaging with equipment providers (manufacturers, sales, leasing)
- Integration with strategies for new and existing buildings



New Jersey 2020 Project

Buildings as Power Sources

Concept

Whole customer solutions to carbon neutrality - link to combined heat and power and customer-sited renewable programs. Tools, services, and infrastructure.

CHP and Renewable Energy to Reach Carbon Neutrality

Existing

- ☑ Info and web links to NJ CHP and Renewable Energy programs

NEW!

- CHP and customer-sited renewables as element of new construction and retrofit:
 - ★ Customer education
 - ★ Integrated energy and financial analysis – energy efficiency *plus* CHP and renewable options
 - ★ Facilitate customer application process
 - ★ Financial packaging
 - ★ Coordinated construction, installation



New Jersey 2020 Project

Connecting Buildings

Concept

Smart Grid strategy for demand management, real time pricing and feed-back, increased distributed generation, and storage capacity for intermittent renewables.

Smart Devices Connected to Smart Grid Network

Existing

- ☑ Proposed AMI pilot (ACE Blueprint for the Future)

NEW!

- Grid auto controls end-uses and supports customer-sited clean energy generation
- Analyze current grid capability, develop capital improvement and management plan
- Incentives for target technologies and pilot development (“prices to devices”)
- Access grants for Smart Grid projects and matching funds for commercial deployments of Smart Grid technology (through EISA 2007)
- Enable utilities to invest in Smart Grid networks through performance based rate-making and planning
- Example: Smart Grid City – underway in Boulder, CO and others



New Jersey 2020 Project

How People Use/Manage Buildings

Concept

Controls, tools, information for energy performance, carbon management. Benchmarking, public awareness, community action. Training and certification requirements.

Managing Energy Performance + Carbon Output

Existing

- ☑ On-line energy calculation tools

plus NEW!

- Required building energy ratings
- Benchmarking and dashboard” technologies
- Energy management controls and equipment service contracts
- Market pull for appliances and equipment with O&M controls + signals
- Statewide public education and visibility for energy performance
- Community partnerships to raise awareness, motivate individual action
- Incentives to help communities set, track and meet targets.
- Required training and certification for O&M personnel, contractors.



New Jersey 2020 Project Connecting People – *Community Partnerships*

Leverage the Power of Communities to Scale-Up

Existing

- ☑ The NJ **Clean Power Community Partners** program of the 2008 “Whole House, Whole Community” campaign
- ☑ 90 NJ Mayors signed US Conference of Mayors Climate Protection Agreement
- ☑ Proposed PSE&G pilots with Newark and Trenton

NEW!

- Comprehensive community-based clean energy initiatives tied to goals
- Community-based social marketing campaigns
- Municipal facilities programs – buildings, schools, streetlights
- Door-to-door direct installation programs – low-cost or deep savings



New Jersey 2020 Project Connecting People *Community Partnerships*

Leverage the Power of Communities to Scale-Up

Additional Concepts:

- New special-purpose ESCO to address municipal buildings in NJ communities
- New special-purpose ESCO to comprehensively address an individual community or small group of communities
- Inter-community competitions in making measurable progress toward clean energy goals
- Making schools the center and beacon (demonstration and education) for broad community energy initiatives
- Moving to community-wide (collective) net-zero new construction
- District energy systems
- Community scale / community-owned renewable generation



New Jersey 2020 Project

Connecting People

Community Partnerships

Leverage the Power of Communities to Scale-Up

Community-Based Public Policy Initiatives:

- Locally-higher building construction and/or equipment standards
- Clean Energy Tax Financing District
- Planning & zoning to promote clean energy
- Local ordinance for time-of-sale disclosure of building efficiency
- Local ordinance for time-of-sale minimum building efficiency requirements
- Adoption of low-energy street illumination standards



New Jersey 2020 Project Connecting People *Community Partnerships*

Leverage the Power of Communities to Scale-Up

Financial Resources:

- \$ Ratepayer-funded programs
- \$ Municipal financing
- \$ Investment by ESCOs
- \$ Local funding
- \$ In-kind resources
- \$ Public support



New Jersey 2020 Project R&D to Innovate

Stay on the Leading Edge

- Engage colleges and universities to conduct research
- Form NJIT Technical Review Committee of leading experts to review technology developments
- Establish High Performance Building and Daylighting Design Lab (e.g., associated with schools of design and architecture)
- Encourage field testing of new technologies (e.g., heat pump water heaters, heat recovery systems, solid state lighting)
- Encourage and recognize business, institutional and community innovations (e.g., funding solicitations)



New Jersey 2020 Project

Scaling-Up to Meet EMP Goals

Scaling up means:

By 2020 reaching large fraction of:

- ≈ 3 million existing NJ households by 2020
- ≈ 700,000 NJ businesses
- ≈ 20,000 homes built each year
- ≈ 300,000 homes that are sold each year
- ≈ 2 million+ square feet of new and renovated commercial and institutional buildings each year

Reducing forecasted electric growth by 2020 by:

- XXXX Megawatt hours of annual energy savings
- 5,000 MW of peak electric capacity reductions



New Jersey 2020 Project

Scaling-Up to Meet EMP Goals

Set Aggressive Goals

- Set interim goals to meet NJ Energy Master Plan Goals:

Example: **Residential New Construction**

- ★ For the \approx 20,000 new homes built each year:
 - 30% participate today in the RNC - 50% by 2010
 - 2011 update energy code and RNC program to next tier of efficiency

Example: **Residential Comprehensive Retrofit**

- ★ For 3 million existing households:
 - Serve 100,000 homes/year by 2010 - 300,000 homes/year by 2013
 - Time of Transaction Auditing (TOTA) requirement by 2012
 - Time of Transaction minimum efficiency score requirement by 2014

Example: **Incandescent Lighting**

- Map out strategy for elimination of incandescent lighting by 2020



New Jersey 2020 Project

Scaling-Up to Meet EMP Goals

\$\$ Expand Funding \$\$

- Increase ratepayer funding as proposed by OCE:

2009	\$166.5 million
2010	\$208.0 million
2011	\$260.0 million
2012	\$325.0 million
Total	\$958.5 million

PLUS

- Market-based financing
- Utility on-bill financing
- Municipal bonds for community investments
- Capacity market value – energy efficiency as a comparable resource in the PJM RPM



New Jersey 2020 Project

Scaling-Up to Meet EMP Goals

Consistent Statewide Program

Consistent *requirements* ...

Consistent *program offerings* “*tools in the tool box*”...

Consistent *marketing and messaging* ...

Consistent *incentives* ...

Consistent *measurement and verification* ...

Consistent *rating and reporting* ...

*to achieve high market acceptance, cost efficiencies and
... build momentum .*



New Jersey 2020 Project

Scaling-Up to Meet EMP Goals

Consistent Statewide Program

■ **Jointly Implemented** Statewide Programs

- ☑ Residential New Construction
- ☑ Consumer Products
- ☑ Equipment Replacement
- ☑ Residential Comprehensive Retrofit
- ☑ Small C&I Direct Install

■ **Coordinated** Program Implementation:

- ☑ Custom Approach for Medium-Large Commercial & Industrial – retrofit and new construction
- ☑ Community Partnerships



New Jersey 2020 Project

Scaling-Up to Meet EMP Goals

Statewide Marketing + Public Education

- **Statewide energy efficiency brand** – New Jersey Clean Energy Program with co-branding
- **Integrated marketing:**
 - Messages for bundles of program services targeted to specific customer groups
 - Message delivery in partnership with range of market participants (retailers, manufacturers, local government, trade associations, etc.)
- **Social marketing** – create emotional and intellectual drivers for consumer commitments to energy efficiency and clean energy.
- **Internet Based Solutions** – Statewide website as portal to energy efficiency and clean energy solutions – tools, programs, links to services, information, etc.



New Jersey 2020 Project

Scaling-Up to Meet EMP Goals

Leverage Resources

Link with existing efforts – state, regional, national – for funding, market reach, technical resources:

- ★ **Energy Star** – Products, Buildings, Home Performance, etc.
- ★ **US EPA** – Climate Leaders, Clean Energy-Environment Partnership
- ★ **US Department of Energy** – High Performance Commercial Buildings, Commercial Building Alliances, Building America, etc.
- ★ **Professional and Trade Associations** – AIA, ASHRAE, AEE, NEMA, ACCA, NJHBA, IBEW, etc.
- ★ **Efficiency Organizations and Labels** – Consortium for Energy Efficiency (CEE), ACEEE, AESP, Alliance to Save Energy, Collaborative for High Performance Schools (CHPS), LEED, NESAE, New Buildings Institute, etc.
- ★ **State and Local Efforts** – lots!



New Jersey 2020 Project

Scaling-Up to Meet EMP Goals

Leverage Resources

Strategic Alliances build market recognition and reduce costs:

- **Cooperative Upstream Co-Promotions** – tap retailers, manufacturers, distributors to stock and sell high-efficiency products, equipment and use best design and installation practices
- **Regional Initiatives** – Coordinate and work with other ratepayer-funded energy efficiency efforts to overcome market barriers, engage major market participants, provide consistent messaging, build knowledge



New Jersey 2020 Project

Scaling Up to Meet EMP Goals

Build Market Capacities

- **Assess job needs – what, when, how many**
- **Identify certification and licensure upgrades and additions**
- **Expand workforce education and professional development (colleges, universities, trade schools, unions, professional associations)**
- **Establish statewide clean energy workforce recruitment, training and accreditation effort**



New Jersey 2020 Project

Scaling Up to Meet EMP Goals

Build Market Capacities

- Partner with professional associations, college and universities to train and certify building and design community (*NJIT, AIA, NJHBA, etc.*)
- Train certify independent, professional building energy code inspectors (*follow example of Connecticut, Massachusetts and Maine*)
- Train, certify building energy rating professionals
- Require and fund contractor training/certification (*HVAC, lighting, etc.*)
- Establish Carbon Neutral Buildings Task Group to advise policy, program, training and certification



New Jersey 2020 Project Recommended 2009 Priorities

Establish Structures

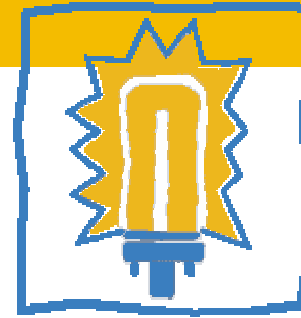
- Establish and implement Clean Energy Utility structure including State Advisory Council and Stakeholder Process
- Undertake workforce development effort

Develop New Capacities to Deliver Large Scale Programs

- Community Partnerships
- Retrofit services with on-bill financing
- C&I market sector account manager expertise and relationships



Northeast Energy Efficiency Partnerships, Inc.



- Susan Coakley
Executive Director
781-860-9177, ext. 12;
scoakley@neep.org
www.neep.org
- Please submit feedback, suggestions and questions on this presentation to both scoakley@neep.org and energymasterplan@bpu.state.nj.us