



Energy,
Environment and
Economic Development Conference:
*Energy Prices – How High and How
Long Are They Going to Last?*

Panel 1

How Are Environmental Regulations Impacting Energy Costs?

**Connecticut Power & Energy Society
Energy, Environment and Economic
Development Conference:**
*Environmental Regulation and Impacts to
Energy Policy and Energy Costs*



MARCH 11, 2015

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Today's Panel Discussion

- Purpose of today's panel is to discuss current and future impacts on energy policy and energy costs associated with environmental regulation.
- Panel offers three unique perspectives:
 - Regulatory Planning: **Tracy Babbidge**, Bureau Chief, Bureau of Energy and Technology, CT DEEP.
 - Consumer Advocate: **Elin Swanson Katz**, State Consumer Counsel, Office of Consumer Counsel.
 - Power Producer: **Kevin Hennessy**, Director - - Federal, State and Local Affairs - - New England, Dominion Resources, Inc.

Environmental Considerations

- Air regulations ratcheting down on emission levels:
 - Criteria air pollutants
 - Hazardous air pollutants
 - Greenhouse gases
- Water regulations mitigating adverse impacts on water quality:
 - Cooling water intake structures (CWA § 316(b))
 - Thermal component (CWA § 316(a))
 - Effluent limitations (Steam Electric Guidelines)
- Trends:
 - Shift to natural gas (many factors)
 - Environmental pressures on existing facilities
 - New investments – natural gas, renewables, infrastructure
 - Transition/retirement pressures

Significant Environmental Regulations

Regulation	Status	Action/Requirements
Clean Power Plan - Clean Air Act § 111(d)	Final Rule expected Summer 2015 -- 30% reduction in CO ₂ over 2005 levels by 2030	Significant CO ₂ emissions reductions
Cooling Water Intake Structures Rule – Clean Water Act § 316(b)	Final Rule October 2014	Significant investment likely for units with once-through cooling.
Clean Water Act § 316(a) Thermal Component of Discharge	In place	To be evaluated during permit review.
Update to Ozone Standard	Proposed Rule December 2014 – Final Rule expected late 2015	EPA considering range of 60-70 ppb (from current 2008 75 ppb standard) – significant NO _x reductions.
Steam Electric Effluent Limitation Guidelines	Final Rule expected Fall 2015	Effluent limits and additional controls for toxic metal concentrations in wastewater.
Cross State Air Pollution Rule (“CSAPR”) – Clean Air Act § 110	Final Rule reinstated January 2015	Controls/Establishes NO _x and SO ₂ limits to curb pollution from upwind generators. Assists with attainment of 1997 and 2008 ozone standard.
Mercury and Air Toxics Standards (“MATS”) – Clean Air Act § 112	Final Rule in place; April 2015 for compliance (April 2016 with extension)	Emission limits and additional controls for toxic metals, acid gases, and particulate matter (coal- and oil-fired units).

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Connecticut Department of Energy and Environmental Protection



Connecticut Department of
**ENERGY &
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PROTECTION**

How are Environmental Regulations Impacting Energy Costs?

CT Power and Energy Society

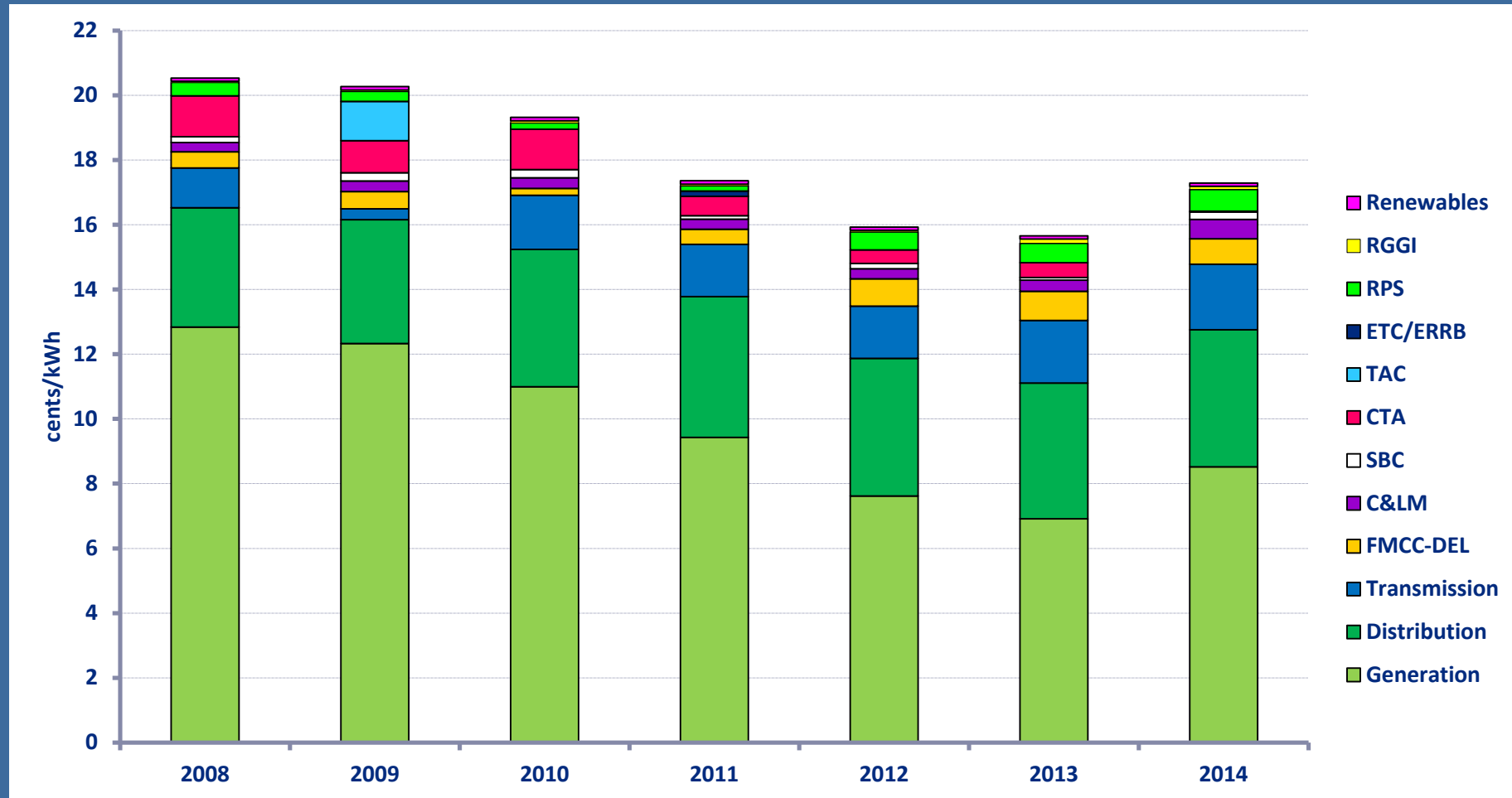
March 13, 2015



Connecticut Department of Energy and Environmental Protection

Impact of Environmental Programs on Rates

Figure: Retail Electricity Rates, 2008 -2014 (2014\$)



* Rates are a weighted average of electricity rates from Eversource and UI. RPS cost from 2008 thru 2012 is based on the growth rates for RPS cost of 2013 thru 2014.



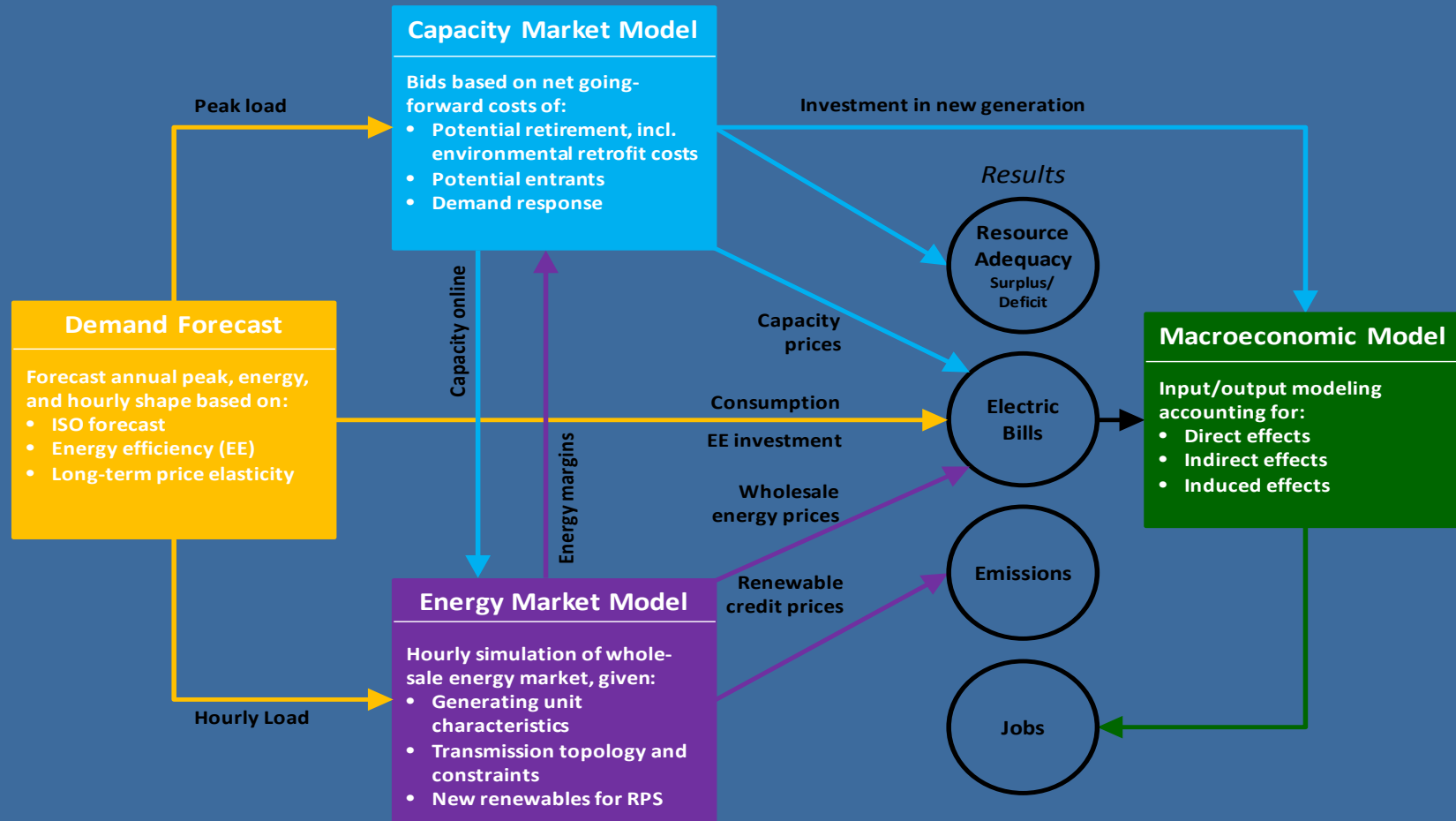
Connecticut Department of Energy and Environmental Protection

2014 Integrated Resources Plan



Connecticut Department of Energy and Environmental Protection

IRP Modeling System



Regional Trends



Connecticut Department of Energy and Environmental Protection

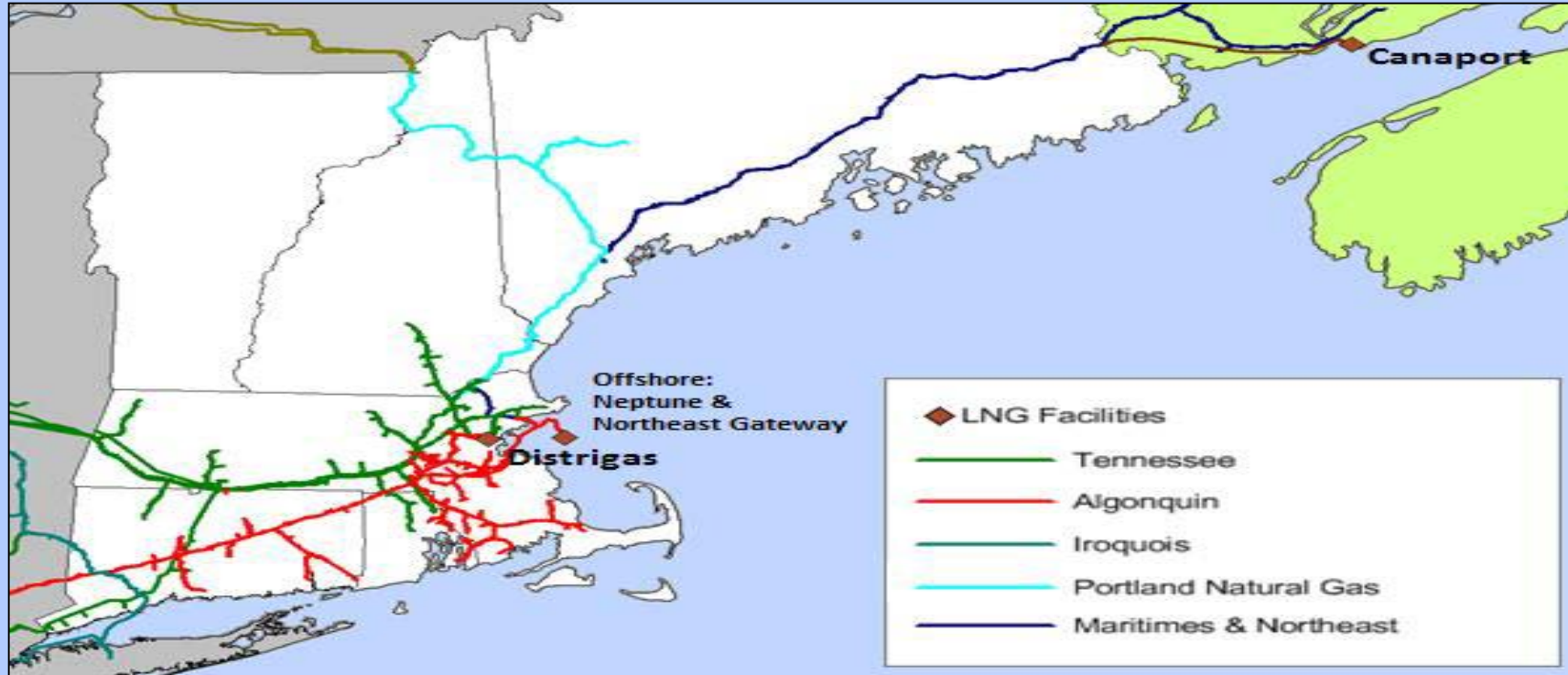
The Eight Key IRP Recommendations



Connecticut Department of Energy and Environmental Protection

A Regional Solution

Existing Interstate Natural Gas Pipelines Serving New England



- No one state can solve the natural gas supply infrastructure alone.
- The region needs to add approximately 1.0 Bcf/day of natural gas capacity, or the equivalent in 5,000 MW of non-gas fired generation or demand reduction to address the steep winter prices caused by natural gas supply constraints.
- The IRP recommends the department procure renewable energy and seek new legislative authority to run a competitive procurement that can cost-effectively resolve the gas infrastructure constraint, up to an amount that is proportional to Connecticut's share of regional electric demand.

Continue to Invest in Cost-Effective Energy Efficiency



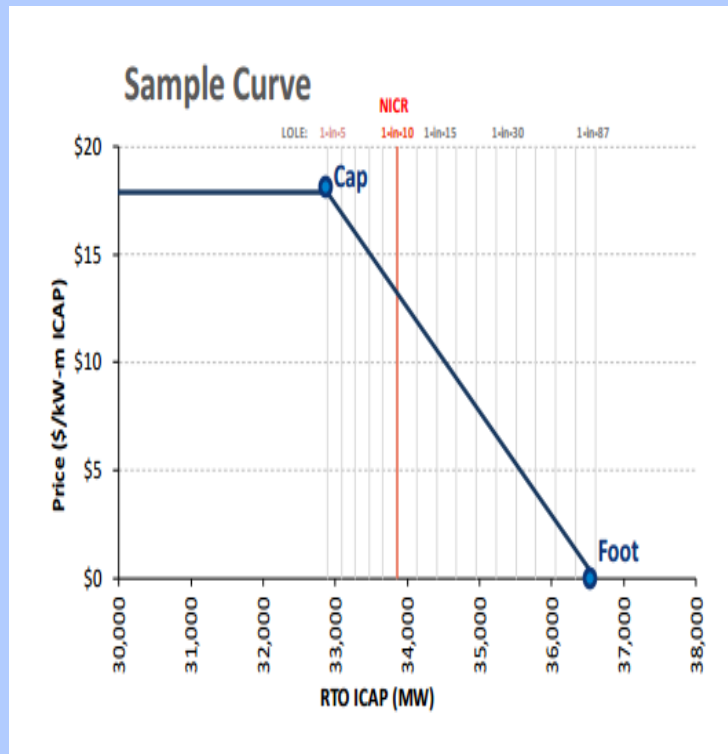
- In addition to energy efficiency competing in the regional gas infrastructure solutions the 2014 IRP recommends:
 - a. Continuing to improve efficiency program design to deliver greater savings at lower costs;
 - b. Refocusing efficiency programs on lowering peak demand;
 - c. Continuing to invest in efficiency measures for state buildings;
 - d. Continue efforts to pursue energy efficiency improvements codes and standards; and
 - e. Identify unrealized energy efficiency savings.

Stepped up participation in the Federal Arena

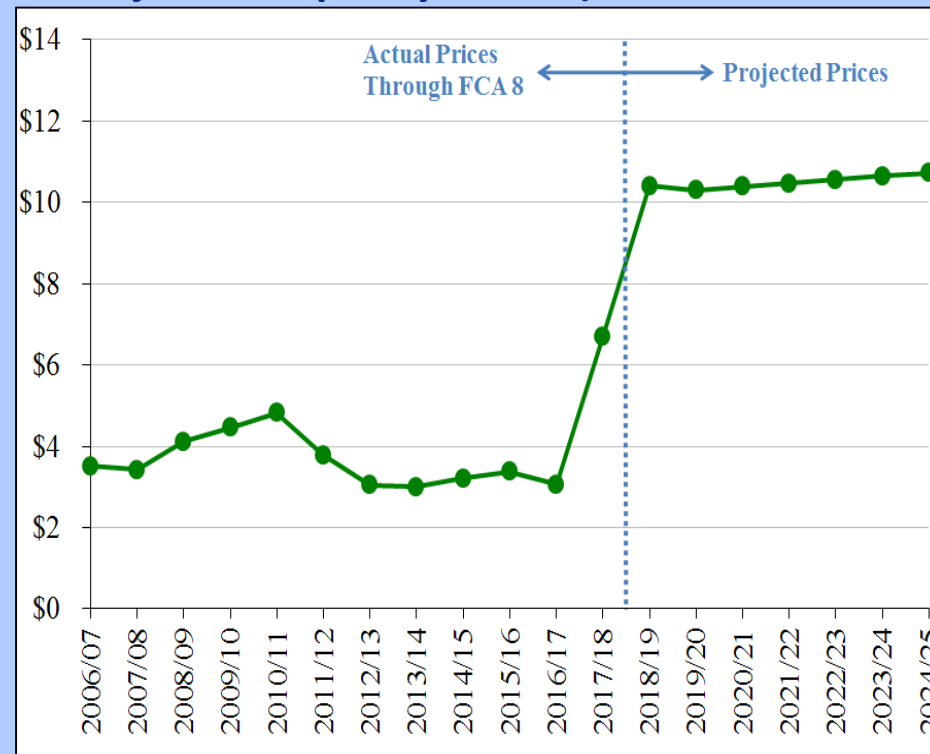


- Connecticut will take a more active stance before federal bodies.
- A key area is defending Demand Response's (DR) ability to participate in the energy and capacity markets.

Procure New Generation if Necessary

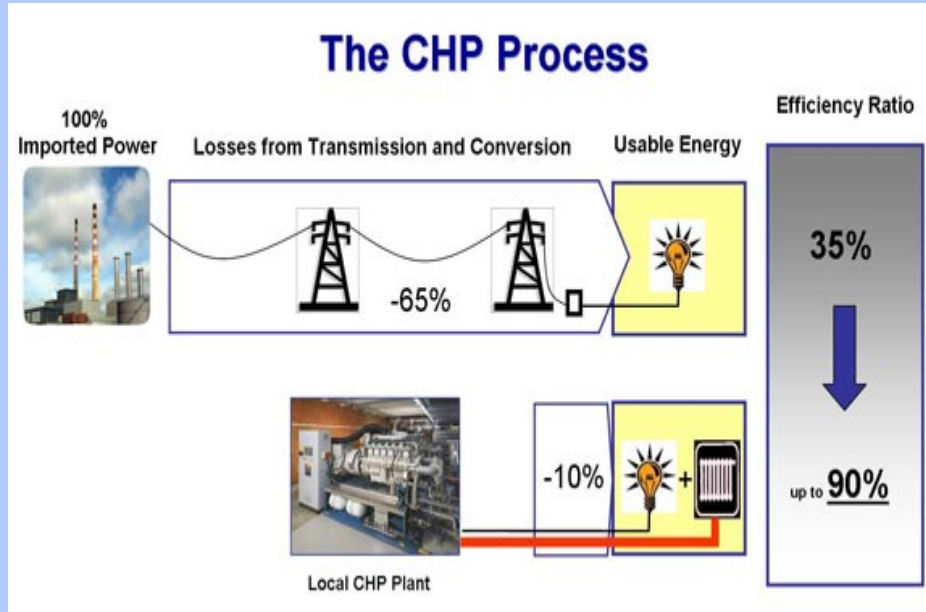


Projected Capacity Prices (2014\$/kW-month)



- **Higher Forward Capacity Prices** expected to bring in sufficient new capacity to New England
- If the market fails, the IRP recommends that DEEP pursue options within state authority to procure capacity resources.

Support Increased Combined Heat and Power Deployment



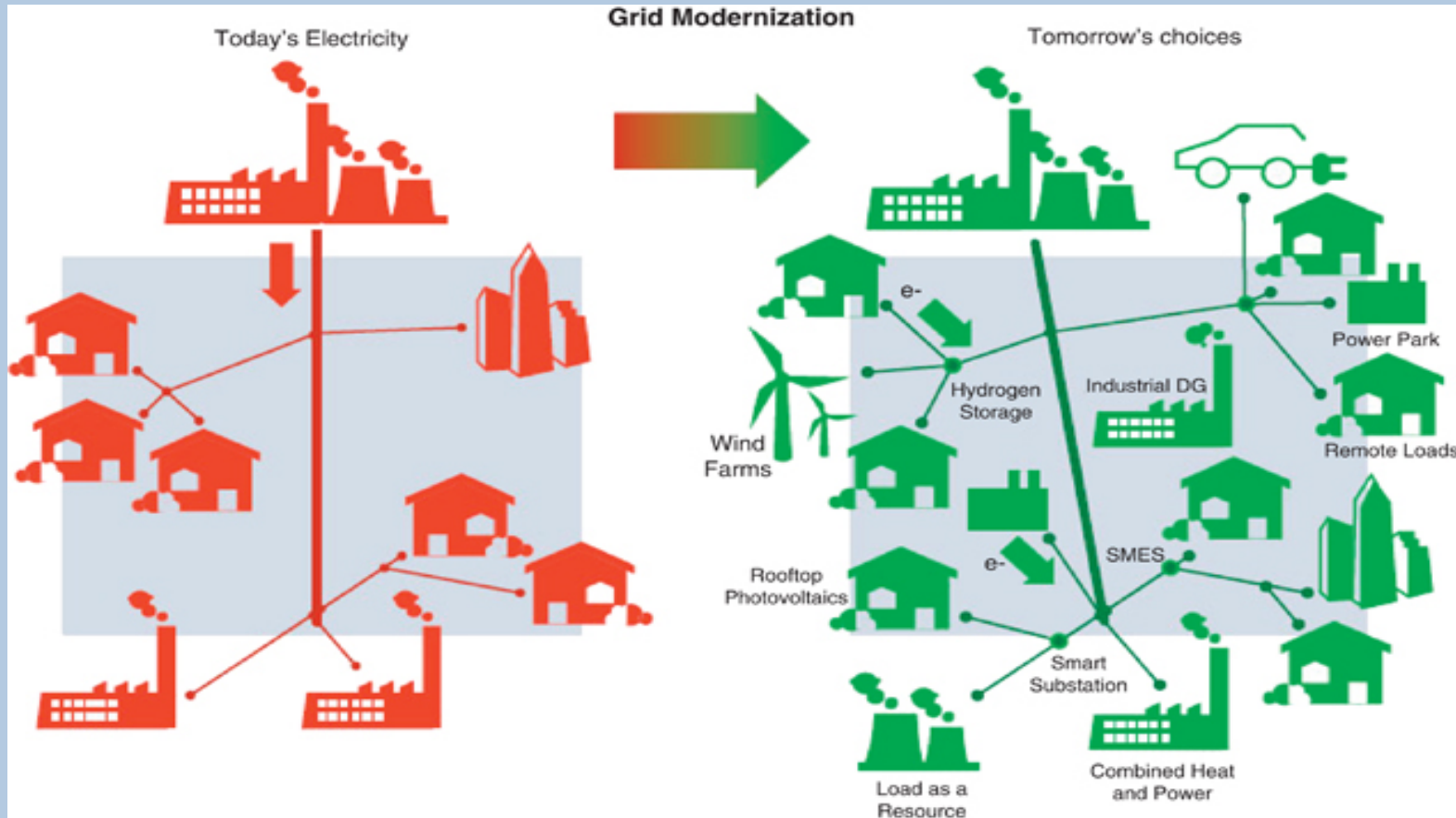
- Revitalize existing incentive programs to help deploy cost-effective CHP potential
- CHP systems can provide special value in locations for micro grids avoiding costly upgrades to the utilities' electric distribution systems.

Support Increased Distributed Generation in Connecticut.



- The IRP recommends continuing to refine and extend programs to support in-state renewable generation.

Modernize Regulation and Incentives for Better Integration of Distributed Resources.



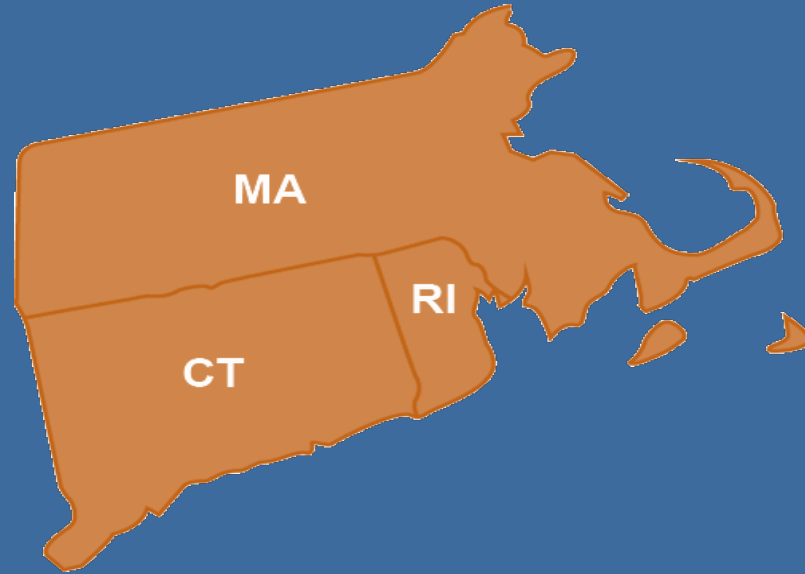
- As part of an ongoing and evolving process, the IRP recommends initiating a proceeding to evaluate the value of distributed generation.

Gradually Phase Down REC Values for Class I Biomass and Landfill Methane Gas Beginning in 2018.



- Monitor RPS compliance and the capacity market and, in the next IRP, consider establishing a schedule for reduced Class I REC value beginning in 2018 for biomass and landfill methane gas.

Draft Clean Energy RFP



- Connecticut has joined with Massachusetts and Rhode Island to purchase clean energy



Overview of Draft Clean Energy RFP



- **General Purpose:** Each state to identify any projects that offer the potential to meet clean energy and greenhouse gas reduction goals in a cost-effective manner, diversifying the fuel mix in New England and help address winter reliability issues.
- **Why Act Jointly?**
 - Open access to low cost, Class I resources in New England that are currently limited by transmission and/or clean hydropower from Canada and New York.
 - A joint procurement opens the possibility of procuring large-scale projects, especially those requiring transmission, that no state could procure if it acted unilaterally.
- **Smaller In-State Projects Welcome:**
 - Although the process opens up the possibility of large-scale projects, each state will select the project(s) that is/are most beneficial to its customers and consistent with its particular goals.



Bid Options

- CT seeking PPAs of up to ~500 MW (wind equivalent) under P.A. 13-303
- MA seeking ~250 MW under Section 83(a)
- RI is not seeking any PPAs

- Known as “Delivery Model”
- Payment from states directly tied to defined minimum MWh delivery under a FERC tariff
- Regulatory risks

Bid can be a combination of options, i.e. Delivery Model with PPA anchor

PPA With No Transmission

PPA With Transmission

Transmission Project With Clean Energy Commitment Without PPA



Clean Energy RFP Timeline

Comments
on Draft RFP

- Taking Comment until March 27, 2014

Review of
Comments

- The participating states and EDCs will review all comments and make changes as appropriate
- Hope is to do this in a matter of weeks

Regulatory
Review

- Massachusetts and Rhode Island statutes require regulatory review of RFP before it can be issued
- Process should be about 30 days

Issue Final
RFP

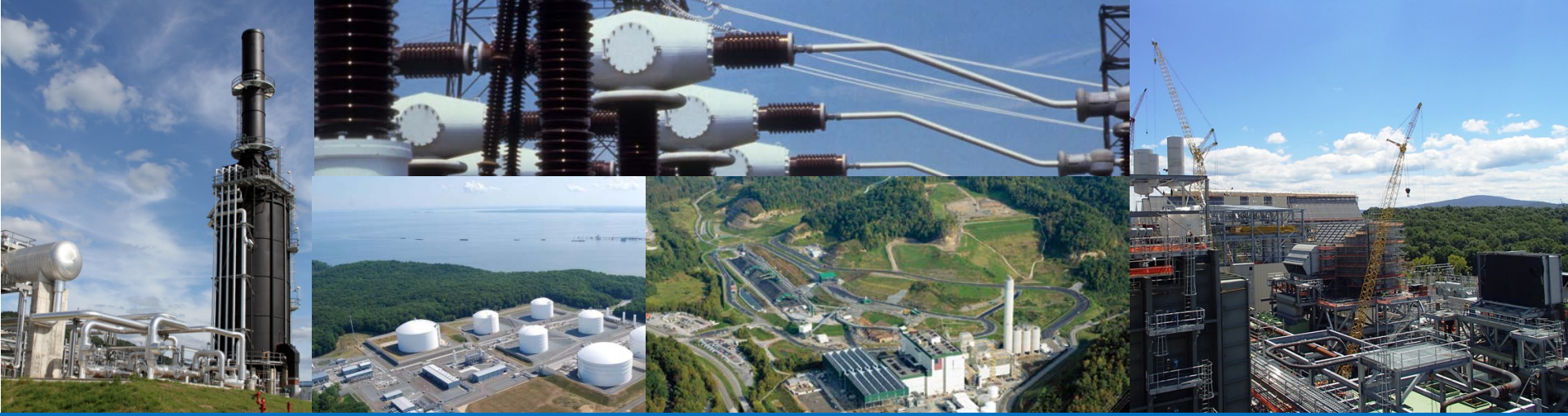
- Conduct bidder conference, respond to questions, and receive bids over 75 days

Select
Winning Bids

- Review of bids will take 3-6 months depending on complication of modeling
- Winning bids will go through regulatory review (PURA/FERC) hopefully completed by end of 2016



Department of Energy and Environmental Protection



Dominion[®]

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Dominion Profile

Primary Operating Segments Overview

Dominion Virginia Power



Electric Transmission

- ❖ 6,455 miles of transmission lines

Electric Distribution

- ❖ 57,000 miles of distribution lines
- ❖ 2.5 million franchise retail customer accounts in VA and NC

Dominion Energy



Gas Transmission

- ❖ Together with Gas Distribution, operates one of the largest natural gas storage systems in the U.S.
- ❖ 12,400 miles of pipeline in eight states
- ❖ Well positioned in Marcellus and Utica Shale regions

Gas Distribution

- ❖ 21,900 miles of distribution pipeline and 1.3 million franchise retail natural gas customer accounts in OH & WV

Blue Racer Joint Venture

- ❖ Utica Shale midstream services

Dominion Generation



Utility Generation

- ❖ 20,300 MW of capacity
- ❖ Balanced, diverse fuel mix

Merchant Generation

- ❖ 4,300 MW of capacity, including nuclear, gas and renewable power

Dominion Retail

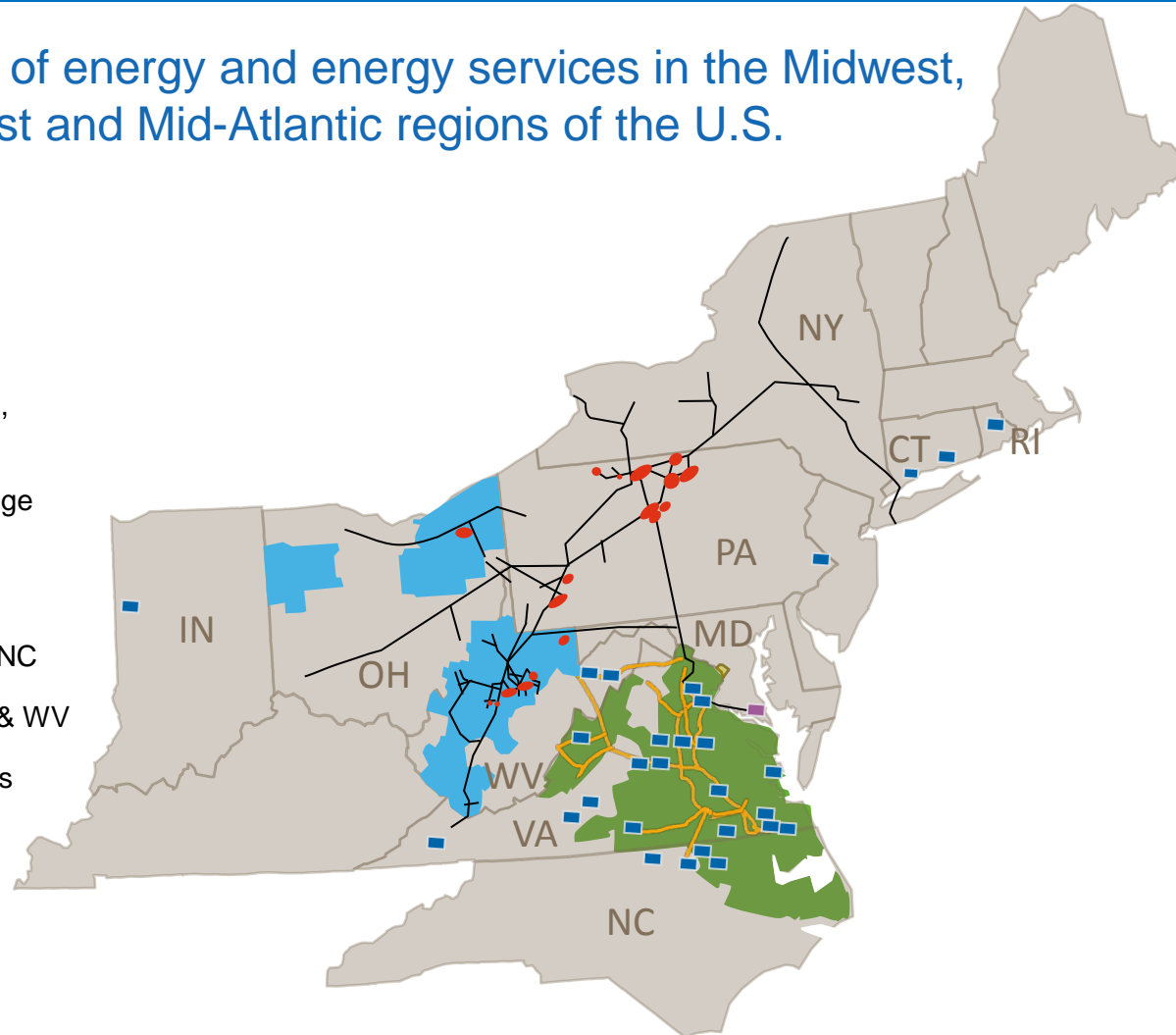
- ❖ Retail Gas & Products/Services
- ❖ 1.5 million non-regulated customer accounts in 12 states

Dominion Profile

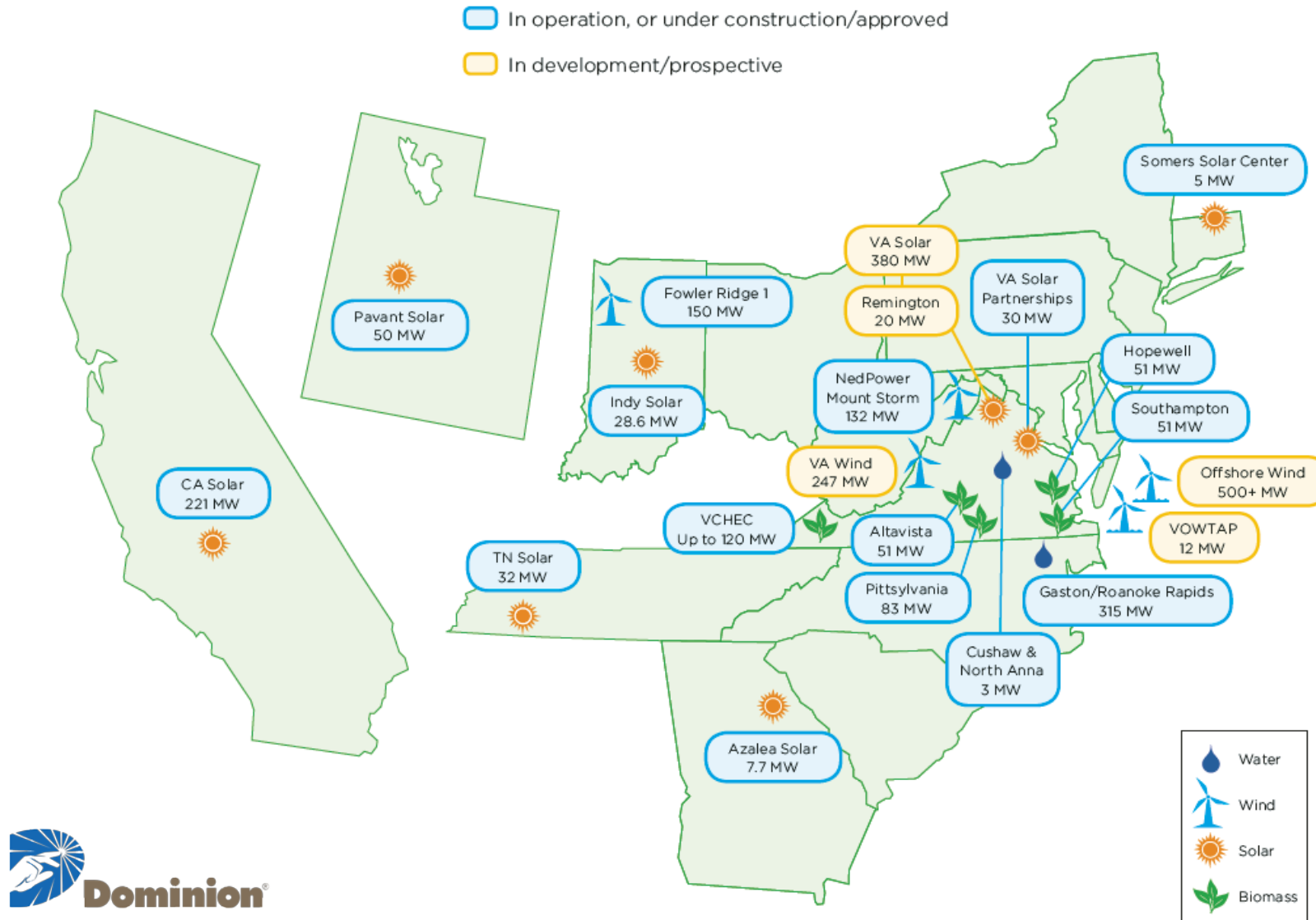
Power and Natural Gas Infrastructure

Leading provider of energy and energy services in the Midwest, Northeast and Mid-Atlantic regions of the U.S.

- 24,600 MW of electric generation
- 6,455 miles of electric transmission
- 12,400 miles of natural gas transmission, gathering and storage pipeline
- 949 billion cubic feet of natural gas storage operated
- Cove Point LNG Facility
- 2.5 million electric customers in VA and NC
- 1.3 million natural gas customers in OH & WV
- 1.5 million non-regulated retail customers in 12 states (not shown)



Dominion Renewable Profile



Conclusion slide from What's the Deal Energy Conference

- Need for energy infrastructure is real and it is not limited to the Northeast.
- Multiple competing forces: market, policy, political, technological etc. What prevails?
- Gas and Renewables are well positioned for growth in Northeast – stay tuned.

Competing Force – Regulatory Policy: EPA 111(d) Proposed Clean Power Plan

- The EPA has proposed carbon pollution standards for existing power plants that are designed to achieve an overall average carbon reduction nationwide of 30 percent by 2030 from 2005.
- The proposed rule, which was issued June 2014, would set individual rate-based carbon intensity goals for each state, based on a state's mix of energy sources and opportunities to achieve reductions.
- The plan is scheduled to be finalized June 2015.

Competing Force – Regulatory Policy: EPA 111(d) Proposed Clean Power Plan

- The nation cannot achieve its carbon-reduction goals without building new nuclear plants and continuing to operate the existing nuclear fleet.
- How will this evolve?
- How will the states balance air and water regulatory policies?

Competing Force – Regulatory Policy: EPA 316(b) Cooling Water Intake Rule

- Final Rule Effective Date: October 14, 2015.
- Rule applies to existing facilities and new units at existing facilities, facilities with intakes capable of withdrawing more than 2 MGD and that use at least 25% of the water for cooling purposes.
- Impingement: All subject facilities required to select from 7 impingement technology options including advanced screens and fish returns, or reduce intake velocity.
- Entrainment: State permitting authority to make site-specific best technology available (BTA) technology decisions after review of site specific factors and cost-benefit.

Competing Force – Regulatory Policy: EPA 316(b) Cooling Water Intake Rule

- EPA took a balanced approach and weighed Energy, Environmental and Economic Benefits.
- How will the states implement the rule?
- For example, Millstone is Connecticut's (and New England's) largest generator and likely its lowest cost provider; it has no carbon emissions and it employs over 1000 full-time employees with an annual payroll over \$100 million.

Conclusion

- New and existing infrastructure is needed for reliability, cost and environmental reasons.
- EPA took a reasoned approach with cooling water regulations – what will they do with air and what will the states do with both water and air regulations?
- Decisions now will have long-term consumer impacts.

How Environmental Policies Impact the Electric System and Electric Bills

Elin Swanson Katz
Consumer Counsel



What is the Office of Consumer Counsel?

- Small, independent, non-partisan state agency since 1975
- Charged by state statute "to act as the advocate for consumer interests in all matters, which may affect Connecticut consumers with respect to public service companies" (Conn. Gen. Stat. §16-2a)
 - Electric, gas, water, telephone, cable television, telecom
- Authorized to participate on behalf of consumer interests in all administrative and judicial forums
 - Matters before the Public Utilities Regulatory Authority (PURA)
 - State and federal court
 - Other state and federal agencies
 - Before Connecticut legislature
- Comprised of attorneys, accountants, financial analysts, and support staff



Environmental Policies have Influenced the Power Plant Fleet

% of Electric Energy Produced in New England	Nuclear	Natural Gas	Oil	Hydro/ Renewables	Coal
2000	31	15	18	13	22
2014	34	44	1	15	5

Most of the reduction in oil and coal usage has been replaced by a cleaner-burning fossil fuel, natural gas. Environmental policy is not the sole reason for the conversion of much of the fleet to natural gas, but it has been a major reason.

(Source of data: ISO-New England)

The Natural Gas Paradox

- Generally cheaper, cleaner



- Has led to coal and oil plant disuse and retirement



- However, on cold days, increased cost and reduced reliability

Move to Natural Gas Overall a Big Positive

- Dire 2005-era price projections have not occurred.
- Reduction in emissions.
- Modernization of the fleet.
- Problem with price and reliability of natural gas on the coldest days of the winter is being solved with:
 - New Pipeline Capacity;
 - Restoration of dual fuel capability;
 - ISO-NE programs and market adjustments;
 - LNG;
 - Demand response.



RPS Overview

- Connecticut's renewable portfolio standards (RPS) presently require:
 - 12.5 percent of electricity from Class I,
 - 3 percent from Class I or Class II, plus
 - 4 percent from Class III.



RPS Bill Impacts

- DEEP's 2013 RPS study estimated the cost of RPS policy at \$168 million per year, \$152 million of which went to Class I compliance.
- Amounts to roughly a 3-4% increase to customer bills, but Class I requirement rises rapidly now to 20% by 2020.

Problems with RPS Policy

- A large percentage of Class I dollars still go out-of-state to old biomass plants in Maine and New Hampshire.
- It was hoped that RECs alone would lead to build-out of plants, but that has not worked—plants need long-term contracts to build.
- Where do ACP dollars go?



Positives of RPS Policy

- Has encouraged long-term contracts for energy and RECs as hedges.
- Competitive contract selection process = highly competitive prices + local generation (at times).
- Would a “pure” RFP/bundle of contracts have been a better route?



Additional and Future Cost Drivers

- The LREC/ZREC program that began in 2012 will cost about \$1 billion over 15 years, or about \$66 million per year.
- 6 mills charge for EE, 1 mill charge for Green Bank, totaling about \$210 million per year
- Proposed Community Solar Program could create an estimated \$50-\$100 million additional annual cost for ratepayers for approximately 300 MW of solar.
- Transmission to access on-shore or off-shore wind would be allocated regionally due to FERC Order 1000, could well be in the billions.



Storm Impacts

For CL&P customers: \$300 million for system resiliency over 5 years; \$60 million per year x 6 years in storm costs

Conclusion

- Important to have an overall “big picture” of bill impacts and to provide transparency around the electric bill.
- Essential to have reliable evaluation, measurement & verification of programs, to demonstrate cost-benefit of programs.
- OCC favors energy efficiency programs that are market-based or are designed to achieve a market-based approach with a prescribed timeframe.
- Experience has shown that competitive processes to develop long-term contracts for renewables tend to work very well.
- The rise from 12.5% Class I at present to 20% Class I in 2020 creates challenges, as may the growth in transmission to distant wind resources.
- It would be nice if we could have less than one Storm of the Century per season.

Office of Consumer Counsel



Where progressive enthusiasm shares an office with flinty skepticism.