The Renewable Energy Committee and the Northeast Chapter of the Energy Bar Association Present:

*Transmission as a Facilitator of Alternative Energy Development: State and Federal Perspectives in the PJM, NYISO and ISO-New England Regions*

A Multi-Location Afternoon Symposium
In Washington, DC, Boston, and Albany, New York

April 10, 2012
2:00 - 5:00 p.m. (Eastern Time)
CLE Credits will not be available for this event.

This event will examine the interaction of State and Federal regulatory policies as they affect inter and intra-regional planning, cost allocation and transmission development as a facilitator of alternative energy development. State and Federal regulators, policy makers, regional transmission operators, transmission providers, alternative energy entities and developers will discuss these perspectives in light of Order 1000 compliance activities.

The event will take place concurrently in three locations, Washington, DC; Albany, New York; and Boston, Massachusetts and will be interactively connected by video-conference. The event will start at 2:00 p.m. and will run until 5:00 p.m. to be followed by a reception in each location. In lieu of in person attendance at one of the sites, participants will be permitted to call into the event. The locations and speaker panels are set out below:

**Day Pitney, 1100 New York Avenue, N.W., Suite 300, Washington D.C. 20005**
Cynthia Marlette, Special Counsel, Patton Boggs, and former General Counsel of the Federal Energy Regulatory Commission
Hon. Lawrence Brenner, Commissioner, Maryland Public Service Commission and former Deputy Chief Administrative Law Judge of the Federal Energy Regulatory Commission
John Buechler, Executive Regulatory Policy Advisor, New York Independent System Operator
Pauline Foley, Assistant General Counsel, PJM

**Day Pitney, One International Place, Boston, Massachusetts 02110**
Theodore Paradise, Assistant General Counsel – Operations and Planning, ISO New England
Abigail Krich, President, Boreas Renewables, LLC
Heather Hunt, Executive Director, New England States Committee on Electricity
Steven Clarke, Assistant Secretary for Energy, Massachusetts Executive Office of Energy and Environmental Affairs
Kurt Adams, Executive Vice President, Chief Development Officer, First Wind and former Chairman of the Maine Public Utilities Commission

**Whiteman Osterman & Hanna, LLP, One Commerce Plaza, Albany, NY 12260**
Bill Helmer, Senior VP and General Counsel, Transmission Developers, Inc.
Carol Murphy, Executive Director, Alliance for Clean Energy
Francis J. Murray, Jr., President and CEO New York State Energy Research and Development Authority
Planning Initiatives & Integration of Renewable Resources

John P Buechler
NYISO Executive Regulator Policy Advisor

Energy Bar Association Symposium
April 10, 2012
Overview

❖ New York
  ▪ State Energy Goals
  ▪ NYISO Initiatives
  ▪ STARS

❖ Northeast
  ▪ Northeastern ISO/RTO Planning Protocol

❖ Eastern Interconnection
  ▪ EIPC/DOE Project

❖ National
  ▪ FERC – Order 1000
New York’s Energy Goals

- New York State Energy Plan objectives include continued development of and investment in:
  - Energy efficiency,
  - In-state energy resources,
  - Clean, renewable energy technologies, and
  - Smart Grid infrastructure
- NYISO serves as a technical advisor to the SEP team
- “45 x 15” Clean Energy Strategy
  - 30% renewable electricity supply
  - 15% reduction of demand from forecast levels by 2015
NYISO Initiatives

- Renewable Resources
  - Centralized Wind Forecasting
  - Economic Dispatch of Windpower
  - Energy Storage Market Innovation
  - NYISO Wind Study
Wind Resource Locations

1,348 MW - Existing
North & West

7,000 MW Proposed
1,900+ MW Southeast
Proposed Generation

Wind & Natural Gas projects dominate proposed developments

*New York Independent System Operator Interconnection Queue, February 2011
Emerging Resources

Capacity additions scheduled for 2011-2013 include:

- Hardscrabble Wind
  - 74 MW – 2011
- Astoria Energy Phase II CCGT
  - 545 MW – 2011
- Howard Wind
  - 62 MW – 2011
- Brookhaven Solar PV
  - 37 MW – 2011
- NRG Dunkirk Biomass
  - 15 MW - 2012
- Black River Biomass
  - 56 MW – 2012
- Taylor Biomass
  - 20 MW - 2012
- Bayonne Energy Center CTs
  - 475 MW - 2012
- Marble River Wind
  - 218 MW - 2012
- CPV Valley Energy Center CCGT
  - 656 MW - 2013
- Hudson Transmission HVDC
  - 660 MW - 2013
Aging Infrastructure

Generation

- Pre 1980s: 60%
- 1980's: 8%
- 1990's: 13%
- 2000's: 19%

Percentage of megawatts of nameplate capacity by in-service date

Transmission

- 2000's: 2%
- 1990's: 1%
- 1980's: 13%
- Pre 1980's: 84%

Percentage of circuit miles – 230 kilovolt and above – by in-service date
STARS

State Transmission Assessment & Reliability Study (STARS)

- New York Transmission Owners studying synergies of transmission replacement and expansion along existing Rights-of-Way
- Evaluating cost effectiveness of upgrading / expanding / modernizing vs. basic rehabilitation
- Includes integration of renewable resources
Northeastern ISO/RTO Planning Coordination Protocol

- Initiated in 2004 by: ISO-NE, NYISO & PJM
- Data and information exchange
- Coordinate interconnection requests and transmission requests with cross-border impacts
- **Develop a Northeast Coordinated System Plan (NCSP)**
- Allocate the costs associated with projects having a cross-border impact consistent with each party’s tariff and applicable federal or provincial regulatory policy
- Open stakeholder process through the Inter-Area Planning Stakeholder Advisory Committee (IPSAC)
Draft NCSP11 Report

- Outline
  - Executive Summary
  - Summary of RTO System Plans
  - Summary of Interregional Studies
  - Additional Coordinated Planning
  - Key Environmental Issues with Potential Interregional Impacts
  - Renewable Portfolio Standards
  - Wind and Renewable Resource Studies
  - Demand-Side Resource Development
  - FERC Order 1000
  - Plans for Additional JIPC Analysis
  - Summary and Conclusions

- Draft Report has been posted for stakeholder review & comment
- Final Report due in May
Eastern Interconnection Planning Collaborative (EIPC)

- EIPC was formed in the Spring of 2009
  - 25 Planning Authorities participated – more than 95% U.S. customers in the Eastern Interconnection covered
- In December 2009 EIPC was awarded ARRA funding by the Department of Energy (DOE) to develop the Interconnection Studies Project for the Eastern Interconnection
- Eastern States (EISPC) also received an award and are key participants in the DOE Project
- Guidance & input is provided by an EI-wide stakeholder advisory group (SSC)
  - Phase 1 analysis is complete and an interim report was filed with DOE in December 2011
  - Phase 2 is underway & scheduled for completion by the end of 2012
Planning Authorities in the Eastern Interconnection
DOE Project Objective

The objective of the project is to prepare analyses of transmission requirements for the Eastern Interconnection under a broad range of alternative futures and develop long-term interconnection-wide transmission expansions in response to the alternative resource scenarios selected through the stakeholder process.

The process does not supplant the existing FERC Order 890 approved regional planning processes, rather the information gained from this project should help inform the 890 regional processes going forward.
Phase 1 Resource Expansion Futures

1. “Business as Usual”
   - This Future assumes that present trends continue into the future based on historical indices
3. Federal Carbon Constraint: Regional Implementation
4. Aggressive Energy Efficiency, Demand Response, Distributed Generation and Smart Grid
6. National RPS: State and Regional Implementation
7. Nuclear Resurgence
Three Scenarios: For Phase 2 Analysis

“Business As Usual”
No new policies or regulations on carbon, no new RPS, no new EPA regulations [F1S17]

“National RPS”
Regionally Implemented 30% National RPS [F6S10]

“Combined Federal Climate and Energy Policy”
National carbon constraint with 42% reduction in 2030 and 80% in 2050, 30% national RPS, increased Energy Efficiency/Demand Response/Distributed Generation/SmartGrid [F8S7]
FERC Order 1000

- FERC Order 1000: Final Rule on Transmission Planning & Cost Allocation
  - Issued on 7/21/11 (Docket RM10-23-000)
- NOPR issued in June 2010 as a Follow-up to the Order 890 Technical Conferences held in Fall 2009 and the Staff Request for Comments issued in October 2009
- The Final Rule largely adopts the proposals from NOPR
- Applies to all jurisdictional transmission providers
  - Including ISOs & RTOs
- Key Elements include:
  - Regional Planning
  - Inter-Regional Planning
  - Transmission needs driven by Public Policy Requirements
  - Non-incumbent Rights
  - Cost Allocation Requirements for Regional & Inter-Regional Projects
Public Policy Driven Projects

- Local & regional planning processes must consider transmission needs driven by public policy requirements established by state or federal laws or regulations.
- No requirement to go beyond existing laws or regulations—but permitted on a voluntary basis.
- Allows for regional flexibility in meeting this requirement.
- Not intended to infringe on state authority.
- Includes requirement for cost allocation.
Status of Compliance Activities in the Northeast

- Stakeholder discussions are taking place within each ISO/RTO’s region
- ISO/RTOs are engaging their TOs
  - Joint compliance obligation
- NYISO, PJM and ISO-NE are discussing inter-regional issues in the context of the Northeast Protocol
- Compliance “issues lists” have been posted
- Identification of tariff changes is underway
- Stakeholder discussions to continue thru compliance filing dates (Oct 2012 & April 2013)
The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state’s bulk electricity grid, administering New York’s competitive wholesale electricity markets, conducting comprehensive long-term planning for the state’s electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.

www.nyiso.com
Massachusetts Clean Energy & Climate Plan for 2020

Steven Clarke
Assistant Secretary for Energy
Commonwealth of Massachusetts

Transmission as a Facilitator of Alternative Energy Development
State and Federal Perspectives in the PJM, NYISO and ISO-New England Regions
April 10, 2012
NASA's Goddard Institute for Space Studies (GISS) in New York monitors global surface temperatures on an ongoing basis. GISS issued press release last week with worrisome findings:

- The global average surface temperature in 2011 was the ninth warmest since 1880.
- The finding continues a trend in which 9 of the 10 warmest years in the modern meteorological record have occurred since the year 2000.
- Earth continues to experience warmer temperatures than several decades ago. The average temperature around the globe in 2011 was 0.92 degrees F (0.51 C) warmer than the mid-20th century baseline.
- "We know the planet is absorbing more energy than it is emitting . . . So we are continuing to see a trend toward higher temperatures. Even with the cooling effects of a strong La Nina influence and low solar activity for the past several years, 2011 was one of the 10 warmest years on record." - GISS director, James E. Hansen.

Source: NASA

Executive Office of Energy and Environmental Affairs
Harvard University Coal Study

- True cost of using coal: $175B-$523B annually
- Adds an additional 9-27 cents per kWh to price of coal
- Lung disease: Particulates and oxides of nitrogen and sulfur kill over 24,000 people annually, including 2,800 from lung cancer.
- Heart disease: 38,200 non-fatal heart attacks annually.
- The 1,550 MW of coal generation in MA is half of all coal in ISO-NE, and approx. 11% of generation in MA

Source: Harvard University Medical School
Energy Costs & Volatility; Energy Independence

- Massachusetts at end of energy pipeline, no domestic fossil fuel
- $22 billion spent on energy annually, $18 billion goes out of state (80%)
- $5,200 direct spending on energy by average household
- Residential and business customers see volatile and increasing prices

Executive Office of Energy and Environmental Affairs
Energy Dollars Flowing Out of MA

- Oil & Natural Gas - Canada
- Oil & Natural Gas - Middle East
- Natural Gas - Caribbean
- Coal – Colombia
- Natural Gas - U.S. Gulf Coast
- Oil - Venezuela

Executive Office of Energy and Environmental Affairs
2008 Global Warming Solutions Act

• Create an economy-wide program to reduce GHG emissions:

  ➢ 80% below 1990 levels by 2050

  ➢ 25% below 1990 levels by 2020
Figure ES-5. Emissions reductions by sector for the portfolio of policies, at the mid-range estimate of 27 percent below 1990 levels by 2020.
### Job increases in 2020, direct and indirect, from the Mass. *Clean Energy and Climate Plan*

<table>
<thead>
<tr>
<th>Category</th>
<th>Jobs (2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal, Calif. vehicle efficiency and GHG standards</td>
<td>6,000</td>
</tr>
<tr>
<td>Federal efficiency standards for medium and heavy duty vehicles</td>
<td>1,000</td>
</tr>
<tr>
<td>Mileage-based auto insurance</td>
<td>3,000</td>
</tr>
<tr>
<td>Clean car consumer incentives</td>
<td>2,000</td>
</tr>
<tr>
<td>Smart growth policy package</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>subtotal — transportation</strong></td>
<td><strong>13,000</strong></td>
</tr>
<tr>
<td>Electric efficiency programs</td>
<td>10,000</td>
</tr>
<tr>
<td>Natural gas, heating oil efficiency programs</td>
<td>9,000</td>
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<tr>
<td>Advanced building energy codes</td>
<td>3,000</td>
</tr>
<tr>
<td>Federal appliance &amp; product standards</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>subtotal — buildings efficiency</strong></td>
<td><strong>23,000</strong></td>
</tr>
<tr>
<td>Renewables (solar, wind, biomass, biofuels)</td>
<td>6,000 - 12,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42,000 - 48,000</strong></td>
</tr>
</tbody>
</table>
### Consumer, Business Savings from Policies in Plan

<table>
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<tr>
<th>$ millions energy cost savings in 2020</th>
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<tbody>
<tr>
<td>Electric efficiency</td>
<td>$2,500</td>
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<tr>
<td>Natural gas efficiency</td>
<td>$800</td>
</tr>
<tr>
<td>Fuel oil efficiency</td>
<td>$200</td>
</tr>
<tr>
<td>Building codes</td>
<td>$100</td>
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<tr>
<td>Appliance &amp; product standards</td>
<td>$400</td>
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<tr>
<td>Federal &amp; Calif. vehicle efficiency standards</td>
<td>$1,700</td>
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<tr>
<td>Clean car incentives</td>
<td>$200</td>
</tr>
<tr>
<td>Pay-by-the-mile auto insurance</td>
<td>$400</td>
</tr>
<tr>
<td><strong>Overall total</strong></td>
<td>$6,300</td>
</tr>
</tbody>
</table>
MA Clean Energy Legislation 2008

- **Green Communities Act**
  - Expands EE delivery mechanisms and goals
  - RPS – expansion and strengthening targets of 1997 Act
  - Net metering provisions
  - Establishes DOER’s Green Communities Program
  - Requires utilities to issue at least 2 RFPs within 5 years for Long Term Contracts (LTC) for RPS eligible renewables

- **Global Warming Solutions Act**
  - 2020 commitments – 25% below 1990 levels
  - 2050 commitments – 80% or more below 1990 levels

- **Oceans Management Act**
  - Provides zoning-like planning of state waters
  - Identifies presumptive areas for wind development

- **Clean Energy Biofuels Act**
  - Mandate for advanced biofuels
  - Paves way for transition to LCFS

*Executive Office of Energy and Environmental Affairs*
Launching the Clean Energy Revolution

• A recent report by the Massachusetts Clean Energy Center found . . .

➢ Nearly 5,000 Massachusetts companies engaged in clean energy business and employing over 64,000 clean energy workers.

➢ These companies reported job gains of 6.7 percent between July 2010 and July 2011 – compared to overall in-state job growth of 1 percent during that same period, with further expansion expected in the year ahead.
Solar

• More than 10-fold increase in solar PV since Governor Patrick took office – from 3.5 MW in 2007 to 97 MW installed to date

• 4-fold increase in number of firms involved in solar energy installation (50 >> 200)

• Governor established a 250 MW by 2017 goal for solar
Wind

• Governor 2,000 MW by 2020 goal for wind energy

• More than 10-fold increase in wind energy since Governor Patrick took office – from 3.1 MW in 2007 to 48 MW currently installed

• Wind Blade Test Facility

• Cape Wind

• Turbine pilings to be made in Mass: plant planned for Cape Wind work

• New Bedford Offshore Wind Terminal

*Executive Office of Energy and Environmental Affairs*
NEWIS

• ISO New England completed their ‘New England Wind Integration Study’ (NEWIS) in 2010

• Primary conclusions:
  
  ➢ NE could meet up to 24% of energy needs from wind by 2020 (10-12 GW)
  
  ➢ Increasing amounts of wind energy will require investments in operational capacity (e.g. wind forecasting) and transmission from high wind areas to areas of high load
  
  ➢ Wind could reduce fossil fueled generation in NE
  
  ➢ Wind in NE has very healthy capacity factors & values
  
  ➢ 200 GW of wind energy potential in NE
Conclusion: A Win-Win Plan for 2020

- Transmission critical to success of large scale renewables in Massachusetts and New England
- Cut energy costs for households and businesses
- Reduce vulnerability to volatile fossil fuel prices
- Improve energy independence
- Create jobs
- Greatest mandatory GHG reduction for 2020 of any state
- Puts us well on the way to 80% mandated reduction in 2050
Planning Transmission for Alternative Energy Resources

Pauline Foley, Assistant General Counsel
Energy Bar Association
Renewable Energy Symposium
April 10, 2012
PJM as Part of the Eastern Interconnection

**KEY STATISTICS**

- PJM member companies: 750+
- Millions of people served: 60
- Peak load in megawatts: 163,848
- MWs of generating capacity: 185,600
- Miles of transmission lines: 65,441
- GWh of annual energy: 832,331
- Generation sources: 1,365
- Square miles of territory: 214,000
- Area served: 13 states + DC
- Internal/external tie lines: 142

21% of U.S. GDP produced in PJM

As of 1/4/2012
State RPS Requirements

- **29 states**
- **DC** and **PR** have an RPS (8 states have goals)

***Minimum solar or customer-sited requirement***

- **Extra credit for solar or customer-sited renewables***
- **Includes non-renewable alternative resources***

Visit [www.dsireusa.org](http://www.dsireusa.org) / January 2012
2026 Renewable Energy Output Targets by State

The graph shows the 2026 Renewable Energy Output Targets by State, with vertical bars representing the predicted energy targets in millions of MWh for each state. The states are listed on the x-axis, and the energy targets are shown on the y-axis.
Fuel Mix of All Queued Generation Interconnection Requests Received since 1999 (Nameplate Energy) (January 31, 2012)

- **Wind**: 41,584
- **Natural Gas**: 57,744
- **Coal**: 5,055
- **Biomass**: 759
- **Wood**: 119
- **Solar**: 3,634
- **Oil**: 752
- **Other**: 938
- **Nuclear**: 7,843
- **Methane**: 476
- **Hydro**: 1,185
- **Diesel**: 103
Figure 1.2: RTEP Development Drivers

ANNUAL RTEP DEVELOPMENT = Baseline + Retool + Scenario Studies

- Load Growth
- Public Policy
- Interconnection Analysis
- Generator Deactivation
- Aging Infrastructure
- Market Efficiency
- Supplemental Upgrades
- Long-term Auction Revenue Rights
- Operational Analysis
- Long-Term Firm Transmission Service
- Interregional
- RPM Auction Results
Order No. 1000 on Transmission Planning and Cost Allocation addresses the following issues:

- **Planning Requirements:**
  - Regional Planning
  - Interregional Planning

- **Public Policy Requirements:**
  - Local and regional planning processes must “consider” transmission needs driven by Public Policy Requirements.

- **Right of First Refusal and Non-incumbent Developers:**
  - Opens up transmission business to new entrants.

- **Cost Allocation Requirements:**
  - Requires Transmission Providers to file regional and interregional cost allocation methodologies that are “roughly commensurate” with the benefits.
• Joint Coordinated System Plan (JCSP) –
  – Interconnection-wide study to evaluate transmission requirements to integrate large quantities of wind in the Eastern Interconnection.

• Eastern Wind Integration Transmission Study (EWITS) –
  – Next incarnation of JCSP.
  – Broad study that involved Eastern Interconnection parties. Used similar methods to JCSP but looked at a broad array of scenarios, e.g., offshore wind.
  – Study Regions included: PJM, NYISO, NE-ISO, MISO, Mid-Atlantic Power Pool (MAPP), Southwest Power Pool (SPP), Entergy, Tennessee Valley Authority (TVA), SERC Reliability Corporation (SERC).

• Eastern Interconnection Planning Collaborative (EIPC) –
  – Agreement among 26 planning authorities in the Eastern Interconnection that comprise 95% of Eastern Interconnection load.
Champlain Hudson Power Express
Project Overview

• 333 mile, underground 1,000 MW High Voltage Direct Current (HVDC) proposed transmission line

• Once constructed, the project will:
  • Deliver hydro and wind power to meet the demands of a growing population and economy
  • Create jobs and fuel economic growth
  • Cut power costs for consumers by $650 million a year
  • Increase the security of the State’s electric grid and lower emissions

• Plans to utilize private financing for $2 billion project

• Broadly supported

• In development since 2008

• Moving steadily through regulatory process

www.chpexpress.com
Champlain Hudson Power Express
Project Overview

**Article VII Transmission Siting Joint Proposal**

- Filed Feb 24th, 2012 with the Public Service Commission
- Broad based support from State Agencies, NYC, City of Yonkers, Riverkeeper, Scenic Hudson, Trout Unlimited and Vermont Electric
- $117M Environmental Trust Fund established if JP approved by PSC
- Protecting, restoring, and improving aquatic habitats and fisheries resources in the Hudson River Estuary, the Harlem and East Rivers, Lake Champlain
- Governance Committee consisting of: TDI; DPS Staff; NYSDEC; NYSDOS; CNY; APA; the New York State Council of Trout Unlimited; Riverkeeper, Inc.; and Scenic Hudson, Inc.;
- Paid out over 35 years

**For Release: Immediate, February 27, 2012**
Contact: Andrew Rush, (518) 618-1513, arush@nynyr.com

**HISTORIC AGREEMENT ADVANCES CHAMPLAIN HUDSON POWER EXPRESS CLEAN ENERGY TRANSMISSION LINE PROJECT**

Albany, NY - Transmission Developers Inc. (TDI) today announced that it has reached agreement with numerous state agencies, municipal governments, and environmental groups with respect to all aspects of the proposed Champlain Hudson Power Express (CHPE) transmission line, including the project route. Furthermore, the document states that the signatories believe the project is in the interest of New Yorkers and should move forward.

The CHPE is a 7,000 megawatt (MW) transmission project that will play a critical role in advancing New York State’s energy policies and economic growth across the state. It will deliver clean, reliable hydro-power to the New York City metropolitan area using cables installed underwater and underground. With an expected annual benefit of $650 million to consumers from lower energy costs per year, the project is also estimated to create 2,400 new jobs in the state of New York across a wide sector of the economy.

The agreement comes in the form of a Joint Proposal (JP) of Settlement that has been filed with the New York State Department of Public Service (DPS) as part of the Article VII process.

The signing parties have been actively involved in a detailed review of the Project since November 2010. TDI President and Chief Executive Officer Donald Jesome expressed his gratitude to the parties who worked collaboratively on the agreement as well as his optimism that the CHPE Article VII Certificate will be granted later this year.

“We are pleased that a diverse group of participants devoted their time and energy to studying this worthy project and voluntarily signed this agreement. Considering the divergent interests of the various signatories to the joint proposal, it is gratifying that we were able to come to this successful conclusion. In the end, TDI believes that the process has resulted in a better project than the one that was originally proposed. While there is still work to be done at the state level, we are now able to move forward with our federal permitting efforts and bring this project one step closer to reality.”

As part of the settlement agreement, a $1.17 million environmental fund has been proposed by the parties to be established in support of projects in the Hudson Estuary, the Harlem and East Rivers, Lake Champlain and their tributaries over the next thirty-five years. The fund will be established if the NYS Public Service Commission implements the JP when it rules on TDI’s application for the Article VII
Transmission as a Facilitator of Alternative Energy Development

Renewable Energy Committee & Northeast Chapter - Energy Bar Association

New England States Committee on Electricity

April 10, 2012
Objective: To consider identifying, through joint or separate but coordinated competitive processes, those resources that have the greatest potential to help meet the region’s renewable energy goals at the lowest “all-in” delivered cost to consumers – the cost of generation & transmission combined.

States’ Policy Observations:
Interest in lowest all-in delivered cost, potential opportunities through coordinated contracting & siting

ISO Technical Analysis: New England has more renewable resources than it needs; could export if developed aggressively
2010: Report to the New England Governors
Coordinated Renewable Procurement

- Assessed New England states’ power procurement practices, processes, looked for coordination opportunities

- Preliminary information about potential mechanisms to coordinate competitive procurement of renewable resources

- Identifies some potential terms & conditions & possible regulatory approval process approaches concerning renewable procurement
Early 2011: Renewable Request for Information

Market inquiry about resources with potential to help meet renewable energy goals at lowest ‘all-in’ delivered cost & for which a coordinated competitive procurement process could facilitate commercial development

Criteria:
- New resources
- Deliverable to New England loads
- Operational by 2016 &
- Eligible for all 5 New England states’ RPS & VT’s renewable goals (wind, solar, landfill gas, small hydro & biomass)
- Other: sought information from transmission developers on transmission that could facilitate delivery
- No Cost Information Requested
RFI: Renewable Generation Responses

Highlights:

- 4,700 MW by 2016

- 90% wind on & off shore

- 50+% Maine on-shore wind

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<tr>
<th>Technology</th>
<th>Within New England</th>
<th>Outside of New England</th>
<th>Total</th>
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<tr>
<td></td>
<td>CT</td>
<td>MA</td>
<td>ME</td>
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<tr>
<td>Biomass</td>
<td>82.0</td>
<td>137.3</td>
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<tr>
<td>Landfill gas</td>
<td>1.6</td>
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<tr>
<td>Small Hydro</td>
<td></td>
<td></td>
<td>3.0</td>
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<tr>
<td>Solar</td>
<td>4.0</td>
<td>27.0</td>
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<tr>
<td>Wind - on-shore</td>
<td>4.0</td>
<td>2519.3</td>
<td>351.0</td>
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<td>Wind - off-shore</td>
<td>30.0</td>
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<td>Total</td>
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<td>169.9</td>
<td>2582.3</td>
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<thead>
<tr>
<th>Technology</th>
<th>Year of initial commercial operation</th>
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<tr>
<td></td>
<td>2011</td>
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<tr>
<td>Biomass</td>
<td>46.4</td>
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<td>Landfill gas</td>
<td>1.6</td>
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<td>Small Hydro</td>
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<td>Solar</td>
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<td>Wind - on-shore</td>
<td>20.0</td>
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<tr>
<td>Wind - off-shore</td>
<td>1030.0</td>
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<tr>
<td>Total</td>
<td>71.0</td>
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**RFI: Transmission Responses**

### Highlights:

- **1 off-shore**
- **1 NY-VT upgrade**
- **5 Maine to load, generally consistent with generator submissions**

<table>
<thead>
<tr>
<th>Project Number</th>
<th>Description</th>
<th>Miles of New Transmission</th>
<th>Technology</th>
<th>Capacity (MWs)</th>
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<tbody>
<tr>
<td>1</td>
<td>Off-shore transmission system to deliver energy from off-shore wind turbines to loads in southern New England</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Up to 4000 MW, in 1000 MW increments</td>
</tr>
<tr>
<td>2</td>
<td>Interconnection between upstate NY and northern VT</td>
<td>Not specified</td>
<td>230 or 345 kV interconnection points</td>
<td>600</td>
</tr>
<tr>
<td>3</td>
<td>Connection from Maine Public Service Company transmission system to CMP transmission system</td>
<td>~26</td>
<td>345 kV AC line within Maine</td>
<td>200+ (at least 200 MW of wind projects have been identified)</td>
</tr>
<tr>
<td>4</td>
<td>HVDC link between northern Maine and downtown Boston</td>
<td>~300</td>
<td>HVDC overhead line and submarine cable</td>
<td>800</td>
</tr>
<tr>
<td>5</td>
<td>Transmission upgrades in western Maine</td>
<td>Not specified</td>
<td>115 and/or 345 kV AC lines</td>
<td>Up to 1100</td>
</tr>
<tr>
<td>6</td>
<td>HVDC link between central Maine and northern Massachusetts</td>
<td>230</td>
<td>HVDC underground line</td>
<td>1100 (with potential for some additional increase on existing lines)</td>
</tr>
<tr>
<td>7</td>
<td>AC transmission upgrades between Maine and southern New England</td>
<td>Unknown</td>
<td>Unknown</td>
<td>1000-2000</td>
</tr>
</tbody>
</table>
NESCOE undertook analysis to provide *directionally indicative* cost analysis in relation to new on- & off-shore wind resources to help inform policymakers’ decisions about the potential for coordinated competitive renewable power procurement.
Renewable Supply Curve Analysis


- Estimated generation cost for various wind resources in New England & New York

- Estimated indicative transmission costs to integrate wind into regional power supply

Resource Focus - Maine & NH Wind
- Corresponds to predominant resource responding to NESCOE’s 2011 renewable RFI & resources in ISO-NE’s 2009 New England Governors’ Study
- Does not indicate preference for wind relative to other renewable resources available to help New England meet clean energy objectives
The Transmission Factor

If no additional transmission was required to integrate wind

- In 2016, 72% of incremental regional needs for renewables would be met by on-shore wind in Maine. Imports would supply 8%.
- In 2020, 47% of incremental regional needs for renewables would be met by on-shore wind in Maine. Imports would supply 20%.

Including estimated transmission costs shifts to off-shore & imports

- In 2016, 44% of incremental regional needs for renewables would be met by off-shore wind & imports. Maine on-shore wind would meet 36%.
- In 2020, 45% of incremental regional needs for renewables would be met by off-shore wind & imports. Maine on-shore wind would meet 32%.
Stakeholder Input on Public Policies that Drive Transmission

NESCOE Public Policy Determination to ISO

NESCOE Identifies Scenario Analysis Assumptions - stakeholder input

ISO conducts Scenario Analysis - stakeholder input on ISO’s draft analysis

ISO preliminary determination about extent to which proposed project also meets other needs such as reliability

ISO-NE Detailed Transmission Study - stakeholder input on parameters

NESCOE communicates whether states interested in next step – if yes, transmission study

State regulatory evaluation & decisions by Participating States, including approved cost recovery approach

ISO puts project in RSP & executes cost recovery per state regulatory decisions
NESCOE Framework Highlights

✓ For efficiency & practicality, makes use of existing New England planning processes & mechanisms – economic study, Planning Advisory Committee, etc.

✓ Stakeholder input is central: stakeholder input opportunity at each step in the process

✓ Some Public Policy Projects may also meet other needs, such as reliability

✓ Transmission project cost estimates, control & assurance of benefits of central importance to states’ cost/benefit analysis
Overview of States’ Roles

✓ States seek to provide consensus views, following stakeholder input, through NESCOE on -
  1. public policies that drive transmission needs,
  2. parameters of Public Policy (Economic) Study, &
  3. if state interest, parameters of more detailed transmission analysis

✓ States decide whether to be Participating States in proposed project
  • no involuntary allocation

✓ Final state analysis & decisions by Participating States’ regulatory authorities
  • Provides open, formal process for stakeholders & interested persons
  • Results in formal state decision upon which ISO-NE will base cost allocation
Public Policy Project only moves forward if Participating States conclude expected benefits outweigh expected costs.

Evaluation requires mechanisms for cost control & assurance of delivery of benefits:
- Power purchase agreements or other contractual arrangements will ensure commitments in place.
- Such contractual agreement may provide, for example, for recovery of transmission costs through tariff.

To be a Public Policy Project, any contract or inclusion of transmission costs associated with public policy projects will be approved by state regulatory authority.
Thanks.

More information about NESCOE’s work at www.nescoe.com & on Facebook
Transmission as a Facilitator of Alternative Energy Development

State and Federal Perspectives in the Neighboring Northeast, PJM, NYISO, and ISO New England Regions

Theodore J. Paradise
Assistant General Counsel - Operations & Planning
About ISO New England

• Not-for-profit corporation created in 1997 to oversee New England’s restructured electric power system
  – Regulated by the Federal Energy Regulatory Commission (FERC)

• Regional Transmission Organization
  – Independent of companies doing business in the market
  – No financial interest in companies participating in the market

• Major responsibilities:
  – Reliable operation of the electric grid
  – Administer wholesale electricity markets
  – Plan for future system needs
New England has Multiple Ties to Neighboring Regions

- Transmission ties to:
  - New York (9)
  - Hydro Québec (2)
  - New Brunswick (2)
New England’s Generating *Capacity* has Shifted from Oil to Natural Gas

*Percent of Total System Capacity*

<table>
<thead>
<tr>
<th>Year</th>
<th>Oil</th>
<th>Nuclear</th>
<th>Natural gas</th>
<th>Coal</th>
<th>Hydro and other renewables</th>
<th>Pumped storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>34%</td>
<td>18%</td>
<td>18%</td>
<td>12%</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>2011</td>
<td>22%</td>
<td>15%</td>
<td>43%</td>
<td>8%</td>
<td>7%</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Other renewables* include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.
New England’s Electric Energy Production has Shifted from Oil to Natural Gas

Percent of Total Electric Energy Production

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>2000</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>31%</td>
<td>28%</td>
</tr>
<tr>
<td>Oil</td>
<td>22%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Coal</td>
<td>18%</td>
<td>6%</td>
</tr>
<tr>
<td>Natural gas</td>
<td>15%</td>
<td>52%</td>
</tr>
<tr>
<td>Hydro and other renewables</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Pumped storage</td>
<td>2%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Other renewables include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.
New England Fleet is Cleaner than the U.S.

More than 90% of New England’s electricity is produced by resources with lower emissions than the U.S.

**Sources:**
*Other renewables* include landfill gas, wood/biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.
Generator Proposals in the ISO Queue

Approximately 6,500 MW

By Type

- Natural gas: 60%
- Wind: 33%
- Biomass: 4%
- Oil: 1%
- Hydro: 1%
- Solar: 0.4%
- Nuclear uprate: 0.2%
- Landfill gas: 0.4%
- Pumped-storage hydro: 1%

By State

- MA: 2,430
- CT: 2,116
- NH: 327
- VT: 317
- ME: 1,198
- RI: 94

As of April 2012
States have Set Targets for Renewables

*Where will resources come from ... in-state or imports?*

### 2020

- **ME**: 10%
- **NH**: 11%
- **MA**: 15%
- **RI**: 16%
- **CT**: 20%

### Renewable Energy Proposals in the ISO Queue

- **ME**: 48%
- **MA**: 25%
- **NH**: 13%
- **VT**: 11%
- **CT**: 2%
- **RI**: 1%

*As of April 2012*
States Seek Renewable Energy

Renewable Targets to Increase Significantly over the Next Decade

- Renewable targets projected to increase from 10% in 2010 to 18% in 2020
  - Adding Energy Efficiency increases target to 30%
- 18% of total New England energy in 2020 is equivalent to:
  - 9,400 MW of wind capacity, or
  - 3,300 MW of biomass capacity
- Proposed renewable projects in New England: ~2,500 MW
  - Primarily wind
Transmission Projects to Maintain Reliability are Progressing

$4.7 Billion invested since 2002, $5.7 Billion on the horizon

1. Southwest CT Phases I & II
2. NSTAR 345 kV Project, Phases I & II
3. Northwest Vermont
4. Northeast Reliability Interconnect
5. Monadnock Area
   a. Greater Springfield Reliability Project
   b. Greater Rhode Island Reliability Project
   c. Interstate Reliability Project
   d. Greater Hartford/Central Connecticut
7. Southeast Massachusetts
   a. Short-term upgrades
   b. Long-term Lower SEMA Project
8. Maine Power Reliability Program
9. Vermont Southern Loop
How are Policy Choices Accounted for in System Planning?

• Some policies make their way into system planning in a way that affects planning assumptions and reliability needs
  – ISO factors federal appliance-efficiency standards into the region’s load forecast
  – ISO factors state energy-efficiency (EE) programs into the transmission planning process
    • New England states spent $850 million on EE in the 2009-10 timeframe

• Other policies are studied through the Economic Study process
  – ISO-NE performs three of these per year and they provide information on given scenarios but do not trigger required transmission system upgrades
FERC Order 1000: Transmission Planning

• Transmission needs to meet “public policy” requirements must be included in regional planning processes
  – ISO’s position: States together need to identify the public policy
  – NESCOE has taken lead on identifying public-policy requirements and associated cost-allocation methods
  – Public-Policy studies could lead to transmission projects that are placed into the Regional System Plan for siting and construction

• Next Steps
  – ISO is working with states and other stakeholders to submit compliance filings to FERC by fall 2012 and spring 2013
Developers Proposing Renewable, Low- and Non-Emitting Resources in New England, Eastern Canada

- Hydro
- Wind
- Biomass
- Landfill gas
- Fuel cell
- Nuclear

1. Northern Pass
   HQ/Northeast Utilities/NSTAR

2. Northeast Energy Link
   Bangor Hydro/National Grid

3. Green Line
   New England ITC

4. Seabrook-Boston-Cape Cable
   NextEra Energy (formerly FPL)

5. Northeast Energy Corridor
   Maine/New Brunswick

6. Wind from the Midwest

7. Champlain Hudson Express
   Transmission Developers Inc. (TDI)

8. Plattsburgh, NY–New Haven, VT

9. Interconnect Northern Maine

10. Muskrat Falls/Lower Churchill
    Newfoundland and Labrador (Nalcor) and Nova Scotia (Emera)
Questions
BIOS
Kurt Adams

Executive Vice President, Chief Development Officer

Executive Summary:

Kurt Adams oversees the development of all First Wind’s projects nationwide.

Career Highlights:

Prior to joining First Wind, Mr. Adams was Chairman of the Maine Public Utilities Commission from 2005 to 2008, where he served as Maine’s primary energy regulator. As chairman, he served as a member of the New England Conference of Public Utilities Commissions, the National Association of Regulatory Utility Commissions (NARUC), the NARUC Electricity Committee, and the NARUC Competitive Procurement Committee. He was also Maine’s representative on the New England State Committee on Electricity. Prior to his position with the Maine PUC, Mr. Adams was Governor John Baldacci’s chief legal counsel from 2003 to 2005. Before joining the Governor’s staff, Mr. Adams was a partner in the law firm of Bernstein, Shur, Sawyer & Nelson in Portland, Maine. At Bernstein Shur, Mr. Adams was the Vice Chairman of the firm’s energy practice. Mr. Adams represented independent power producers in all facets of project development. Mr. Adams also represented national and international private and public sector clients on energy projects, and lenders on energy project financings.

Education and Credentials:

- Juris Doctor from the University of Maine School of Law
- MA in International Affairs from The George Washington University
- BA Skidmore College
Maryland PSC Commissioner Lawrence Brenner

Lawrence Brenner was appointed to the Maryland Public Service Commission in April 2007. As an adjunct to his responsibilities on the PSC, he also serves as Chairman of the Washington Metropolitan Area Transit Commission, formed by interstate compact among Maryland, Virginia and the District of Columbia to regulate private sector passenger carriers regionally. He also chairs the Mid-Atlantic Distributed Resources Initiative, formed by seven state utility commissions in collaboration with federal and regional authorities to facilitate cost-effective distributed resources, demand response and energy efficiency. He is the Commission's representative on the Boards of the Organization of PJM States ( OPSI) and the Mid-Atlantic Conference of Regulatory Utilities Commissioners ( MACRUC).

Prior to joining the PSC, Commissioner Brenner was the Deputy Chief Administrative Law Judge for the Federal Energy Regulatory Commission (FERC), where previously he had been an administrative law judge. In addition to deciding cases as a trial judge, he had extensive experience at FERC as a mediator in large, complex cases, serving at the joint request of opposing parties.

Previously, he was a judge for the U.S. Department of Labor and U.S. Nuclear Regulatory Commission (NRC). Prior to his appointment as a judge, Commissioner Brenner had been in private practice and had served in supervisory and attorney positions with the NRC. He is admitted to practice law in Maryland, the District of Columbia and New York.

Commissioner Brenner received his Juris Doctor law degree from the State University of New York at Buffalo in 1973 and his B.A. in Economics from Brooklyn College in 1967. He won the best brief award in the annual law school moot court competition. He was in the Army from 1968-1970, including service in Vietnam.

Commissioner Brenner is a past president of three professional associations: The Mid-Atlantic Conference of Regulatory Utility Commissioners, a ten-state organization (2010-11); the Forum of U.S. Administrative Law Judges (2003-05); and the Federal Administrative Law Judges Conference (2002-03). He is married and has three adult children.
BIOGRAPHICAL INFORMATION

Since 2002, John has been the Executive Regulatory Policy Advisor for the New York Independent System Operator (NYISO), in which capacity he advises the NYISO’s CEO, officers and Board on key regulatory issues. Previously, John was the first Director of Regulatory Affairs for the NYISO (2000-2002) and also served as the acting Vice President of Market Structures (2005-2006). During 1998 & 1999, John was the Project Managing Director for the New York ISO with overall responsibility for the transition of the New York Power Pool to an Independent System Operator.

John had primary responsibility for the development of the NYISO’s Comprehensive Reliability Planning Process which was approved by FERC in December 2004, for the NYISO’s December 2007 Compliance Filing in response to Order 890’s Planning Principles and is currently responsible for compliance with Order 1000. He has also played a key role for the NYISO regarding inter-regional coordination issues—including planning. John represented the NYISO on the working group that prepared the EIPC proposal that was awarded a grant by the DOE to establish a collaborative process for interconnection-wide transmission analysis. He continues to play a lead role in the implementation of the EIPC project.
Steven Clarke

From 2007 to 2008, Assistant Secretary Clarke, a resident of Belmont, served as a clean energy project manager at EEA, and then became the DOER’s director of wind energy development in 2009. While there, he led initiatives to develop renewable energy on state owned lands and facilities and ensured progress towards the Governor’s 2020 2,000 megawatt wind energy goal. He also co-authored a U.S. Offshore Wind Collaborative report assessing the future of off-shore wind energy in the U.S. He earned master’s and bachelor’s degrees from Columbia University. Prior to joining EEA, he was pursuing a doctoral degree in energy and environmental policy at Stanford University.
Ms. Foley, assistant general counsel at PJM Interconnection, L.L.C., is primarily responsible for the legal issues regarding transmission planning and generator/merchant interconnections. Ms. Foley has been involved extensively with the development of PJM’s Order No. 1000 regional and interregional transmission planning and cost allocation initiatives. Recently, she has also been active in the Net Energy Metering Senior Task Force.

Prior to coming to PJM, Ms. Foley practiced law in several capacities including in-house counsel for Pinnacle West Corporation in Arizona and PSEG Services Corporation in New Jersey. She was an associate with Thelen, Reid & Priest, LLC, where she concentrated her practice in both state and federal electric utility law representing another large New Jersey electric utility and providing guidance throughout the state’s deregulation process. Ms. Foley also served as a Deputy Attorney General at the New Jersey Division of Law where she served as both a counselor and a prosecuting deputy before the professional boards.

While with PSEG, Ms. Foley served as a utility representative on the large and small generator interconnection working groups at the Federal Energy Regulatory Commission. The focus of those working groups was to develop interconnection procedures which served as a model for Order No. 2003 (Large Generator Interconnection Procedures) and Order No. 2006 (Small Generator Interconnection Procedures).

Ms. Foley also served as the Legal Chairperson on the WestConnect Legal Subcommittee in Arizona. WestConnect is composed of utility companies who collaborate to provide transmission of electricity in the Western Interconnection.

Ms. Foley received her juris doctor degree from Rutgers Law School in Newark, New Jersey. She is admitted to the Pennsylvania and New Jersey Bars. She is a member of the Energy Bar Association.

PJM Interconnection, founded in 1927, ensures the reliability of the high-voltage electric power system serving 58 million people in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. PJM coordinates and directs the operation of the region’s transmission grid, which includes 61,000 miles of transmission lines; administers a competitive wholesale electricity market; and plans regional transmission expansion improvements to maintain grid reliability and relieve congestion.

As a senior executive, public official, and attorney, Bill Helmer has assembled a record of exceptional achievement working for almost three decades in the areas of environmental and energy regulation and project development.

Bill has occupied senior positions in New York State government, litigated groundbreaking cases before federal courts and the highest court in New York State, and handled the legal issues associated with the development and financing of many large and complex power projects. Since 2008, he has served as Senior Vice President, General Counsel, and Secretary at Transmission Developers, Inc. and its subsidiaries. Transmission Developers is a Blackstone Group company.

Bill is a graduate of Hamilton College, and he earned a Master of Arts degree at Columbia University in New York City. He graduated with honors from the Law School of the State University of New York at Buffalo in 1982.

After a judicial clerkship, Bill practiced law privately in Albany, New York for a dozen years until he was placed in charge of the Environmental Protection Bureau in the State Attorney General's office. The Bureau serves as the litigation counsel for all environmental cases involving state bodies such as the Departments of Environmental Conservation and State, the Adirondack Park Agency, and many others. During his tenure as Bureau Chief, Bill managed a staff that included over thirty attorneys, six scientists, and dozens of other employees in offices located in Buffalo, Albany, and New York City.
From 1999 until 2007, Bill served as Special Counsel in the New York Power Authority’s Law Department. At the Authority, Bill oversaw all legal matters associated with the Authority’s nuclear fleet until the plants were sold to Entergy Corporation late in 2000. Shortly before the sale, Bill also assumed responsibility for the Authority’s hydroelectric relicensing portfolio. By early 2007, new 50-year federal licenses had been issued for the Authority’s projects on the St. Lawrence and Niagara Rivers.

Bill is a sought-after writer and lecturer. He has served as an adjunct faculty member at Union College, where he designed and taught "The Land and the Law" Environmental Studies course, and he has been a featured speaker at many programs sponsored by the New York State Bar Association. At the Bar Association, Bill sits on the Executive Committees of the Environmental and General Practice Sections. He is also a past chairman of the latter section and a past member of the Public Utility Law Committee.

Bill’s published works include many articles and sixteen entries in the official Encyclopedia of New York State. He has served as a quarterfinals judge for the National Environmental Law Moot Court competition held annually at Pace Law School. He is also the co-host of the "Capital Green Scene" weekly radio program on WVCR-FM 88.3, which made its debut on Earth Day, 2008.

Bill is admitted to practice in all courts of New York State. He is also a member of the bars of the Supreme Court of the United States, the Second Circuit Court of Appeals, and the District Court for the Southern District of New York.

Bill resides in Delmar, New York, with his wife, Maureen, and their three children.

Home telephone: 518-475-0798
Cell telephone: 518-694-6462
E-mail address: wshelmer@aol.com
MAJOR ENERGY PROJECT INVOLVEMENT

**Nuclear Facilities**
Indian Point 3 (owner’s counsel)
Fitzpatrick (owner’s counsel)

**Cogeneration Facilities**
Rensselaer Cogeneration (lessor’s counsel)

**Waste to Energy Facilities**
SEMASS (seconded assistant general counsel)

**Hydroelectric Facilities**
Niagara (owner’s counsel)
St. Lawrence—FDR (owner’s counsel)
Blenheim—Gilboa (owner’s counsel)
Glens Falls/Brookfield (owner’s counsel)

**Oil/Gas**
Poletti (owner’s counsel)

**Power Transmission Projects**
Maine Power Express (general counsel)
Oswego Hudson Power Express (general counsel)
Champlain Hudson Power Express (general counsel)
Niagara—Adirondack Tie Line (owner’s counsel)
Heather Hunt

Heather Hunt joined NESCOE as Executive Director in January 2009. Prior to that, she had a regulatory law practice in Connecticut for six years. Previously, she was Director of State Government Affairs at United Technologies Corporation and a Group Director, then Vice President of Regulatory at Southern Connecticut Gas. Earlier in her career, she was a Public Utility Commissioner in Maine and Connecticut and worked for the Legal Counsel of a Connecticut Governor. She graduated from Fairfield University and the Western New England College School of Law.
Abigail Krich – Brief bio for the April EBA transmission symposium

Abby Krich founded Boreas Renewables in 2008 to provide consulting services to renewable energy project developers with a focus on technical and electricity market issues including interconnection and forward capacity market participation. In addition to project-specific work, she advocates within NEPOOL and ISO New England for electricity market rules and system planning that will allow for the development and integration of high levels of renewable energy within the region for Renewable Energy New England (RENEW). She co-chairs the Boston chapter of Women of Wind Energy. Prior to forming Boreas Renewables, Krich was a Senior Project Developer at Tamarack Energy. She holds a Master’s of Engineering in Electrical and Computer Engineering and a Bachelor of Science in Biological and Environmental Engineering, both from Cornell University.
BIOGRAPHY OF

CYNTHIA A. MARLETTE

Cynthia A. Marlette has over 30 years of experience in regulatory and policy issues affecting the nation’s energy industries. Currently Ms. Marlette is Special Counsel at the law firm Patton Boggs LLP in Washington, D.C., specializing in energy matters. Prior to that she served in a variety of senior positions at the Federal Energy Regulatory Commission (FERC), including six years as the agency’s general counsel, where she was responsible for providing legal and policy advice in all areas of the agency’s regulation, including: transmission and sales for resale of electric energy in interstate commerce; independent system operators and regional transmission organizations; reliability of the U.S. bulk power system; mergers and acquisitions of public utilities and utility holding companies; certification of cogeneration and small renewable power facilities; hydroelectric licensing; natural gas transportation and wholesale sales in interstate commerce; certification of natural gas pipeline projects; and Federal Power Act and Natural Gas Act compliance issues. She was also responsible for defending the agency’s decisions before the courts.

In addition to twice serving as general counsel of FERC, Ms. Marlette held a number of other positions at the agency, including principal deputy general counsel, associate general counsel, and legal advisor to the chairman. As principal deputy general counsel, she directed the agency’s implementation of the Energy Policy Act of 2005, which involved over a dozen rulemakings under new authorities granted by Congress. Ms. Marlette also spent 10 years as associate general counsel for hydroelectric and electric matters. She oversaw the drafting of Order No. 888, the FERC’s landmark rulemaking which opened up the nation’s electric transmission grid to non-discriminatory access and laid the foundation for competitive wholesale power markets, and participated in the rule’s successful defense before the United States Supreme Court.

Ms. Marlette has testified before numerous congressional committees on proposed energy legislation, including the Energy Policy Act of 1992, Public Utility Holding Company Act reform, and the Energy Policy Act of 2005. She received the Presidential Rank Award for Meritorious Executive in the Senior Executive Service from President George W. Bush in 2008 and from President Clinton in 1997. She is admitted to practice before the United States Supreme Court, the U.S. Court of Appeals for the District of Columbia Circuit, the District of Columbia Court of Appeals, and the Court of Appeals of Maryland. She received her B.A. degree from the University of South Florida and her J.D. degree from the American University Washington College of Law.
Carol E. Murphy has been a leader in New York’s energy policy and political arena for over three decades. She is the Executive Director of the Alliance for Clean Energy New York, Inc. (ACE NY), a New York non-profit corporation formed in 2006 to promote clean and renewable energy and energy efficiency.

She was named as a member of Governor Cuomo’s Energy and Environment Transition Committee and served on Governor Spitzer’s Energy and Environment Transition Policy Advisory Committee. She was a member and Committee Chair of Governor Paterson’s Task Force on Renewable Energy. She also serves as a member of New York’s RGGI Advisory Board, Climate Action Council Advisory Panel, New York City’s Energy Policy Task Force and the Solar City Advisory Board. She is a board member and past president of Women in Communications and Energy, a non-profit organization providing networking and mentoring opportunities for women in the energy and communications industries.

She is a nationally recognized expert on energy issues and a frequent commentator in the media. Networking magazine featured her work at ACE NY as their July 2008 cover story. She received the 2010 Environmental Equinox award from Citizens Campaign for the Environment for her outstanding environmental leadership and protection of our natural resources.

Prior to founding Trailhead Energy Advisors in 2005, a consulting firm specializing in business development, government and public affairs services to the energy industry, Ms. Murphy was Vice President of Government Affairs and Communications for the New York Independent System Operator (NYISO) from 2001-2005.

The NYISO is the not-for-profit corporation charged with operating New York State’s high voltage transmission system and administering its $13 billion competitive, wholesale electricity markets. Ms. Murphy worked with local, state and federal government to provide a vital information link and advance the NYISO’s public policies. She was responsible for all internal and external communications developed by the NYISO. She served as chief spokesperson during the 2003 Northeast blackout.

Formerly, Ms. Murphy was the Executive Director of the Independent Power Producers of New York, Inc. (IPPNY), a statewide trade association representing independent generators. During her ten-year tenure, Ms. Murphy successfully led the organization through the transition from PURPA contracts to competitive energy markets. The percentage of New York State’s electric power produced by IPPNY members rose from 12 percent to over 70 percent.

In 1992, under her leadership, IPPNY was awarded Independent Energy magazine's national "Industry All Star" award for excellence in government affairs and public relations. In addition, Ms. Murphy represented IPPNY on the national level as a board member of the Electric Power Supply Association (ESPA) and the National Independent Energy Producers (NIEP) – two Washington, D.C.-based trade associations.
Prior to joining IPPNY in 1991, Ms. Murphy was Legislative Director of the Energy Association of New York State, the trade association representing the state’s investor-owned gas and electric utilities. From October 1987 to January 1991 she was responsible for the association’s state lobbying efforts.

Ms. Murphy was a senior legislative analyst for energy and economic development issues with the New York State Senate Majority and the Assembly Minority. She also served as the Regional Director for the Distilled Spirits Council of the United States.

Carol Murphy holds a Masters of Public Administration from the Rockefeller College of Public Affairs, State University of New York at Albany and a Bachelor of Arts degree, cum laude, in History/Political Science from SUNY Albany.

###
Frank was appointed President and CEO on January 26, 2009. Prior to his appointment, Frank served as Senior Advisor at the international environmental consulting firm Ecology and Environment, Inc. Frank was previously a policy advisor to the United States Secretary of Energy, assisting in the development of the Clinton Administration’s national energy policy.

In the early 90’s, Frank served as the New York State Commissioner of Energy and Chairman of the NYSERDA Board of Directors. He also served as Chairman of the State Energy Planning Board, a multi-agency statutory board charged with the responsibility of developing a comprehensive energy plan for the State that integrated State energy, environmental and economic development policies.

In 1985, Frank was appointed Deputy Secretary to Governor Cuomo for Energy and the Environment, a position he held until 1992. He represented New York in numerous national and regional energy and environmental activities, including the Coalition of Northeastern Governors, the National Governors’ Association, and the Council of Great Lakes Governors. Frank began his work on New York State energy issues as legislative counsel and then as an energy and environmental policy advisor to Governor Hugh Carey.
Theodore J. Paradise

Theodore J. Paradise is the Assistant General Counsel, Operations & Planning at ISO New England Inc. where he oversees legal issues related to transmission planning, siting, cost allocation, as well legal issues associated with generator interconnection, system operations and related compliance matters. Theodore also chairs the Regulatory and Legislative Committee of the ISO/RTO Council. Prior to joining the ISO in March of 2004, Theodore was an attorney with the energy practice group of Swidler Berlin Shereff Friendman LLP in Washington, DC. Theodore is a graduate of Georgetown University Law Center.