



**2006  
NPCC STATISTICAL  
BROCHURE**

October 2006

## **INTRODUCTION**

This pamphlet presents an “at a glance” summary of historical and projected seasonal peak-hour demand, annual net energy for load, capacity, transmission expansion and improvements, and other information for the Northeast Power Coordinating Council (NPCC) and its five areas. The intent is to summarize data that are useful to NPCC members and those interested in the organization. NPCC’s web site ([www.npcc.org](http://www.npcc.org)) and NERC’s “2006 Long-Term Reliability Assessment” ([www.nerc.com/~filez/rasreports.html](http://www.nerc.com/~filez/rasreports.html)) provide additional detailed information beyond that which can be readily presented here. A list of NPCC members and other commonly used reference items is also included.

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### **NPCC Staff**

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	Director, Strategic Planning
Francine Cox	Administrative Assistant
Philip A. Fedora	Director - Regulatory Affairs, Market Reliability
Maritza Feliciano	Executive Assistant
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Jason Hickman	Senior Compliance Engineer
Brian Hogue	Information Management/System Administration
Donal J. Kidney	Senior Engineer
Stanley E. Kopman	Director, Planning & Compliance
Quoc Le	Manager, Compliance
John G. Mosier, Jr.	Director, Operations
Reza Rizvi	Compliance Engineer
Frantz Roc	Senior Systems Administrator
Paul A. Roman	Manager, Operations Planning
Guy V. Zito	Manager, Planning

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#### **Co-Vice Chairman**

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#### **Chairman**

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#### **Vice Chairman**

Daniel Soulier — *Hydro-Québec TransÉnergie*

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#### **Chairman**

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#### **Vice Chairman**

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#### **Vice Chairman**

William McEvoy — *Northeast Utilities*

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#### **Vice Chairman**

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### **ABOUT THE REGION**

The Northeast Power Coordinating Council (NPCC) is one of the eight regional reliability councils constituting the North American Electric Reliability Council (NERC). The total population served is approximately 56 million. The area covered is approximately 1 million square miles. From an electric load perspective, 20% of the Eastern Interconnection load is served within NPCC. For Canadian electricity requirements, 70% of Canadian load is located within the NPCC region.

NPCC contains five geographic areas consisting of the six New England states (Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire, and Maine), the state of New York, the Province of Ontario, the Province of Québec, and the Canadian Maritime Provinces of New Brunswick, Nova Scotia, and Prince Edward Island.

### **ABOUT NPCC**

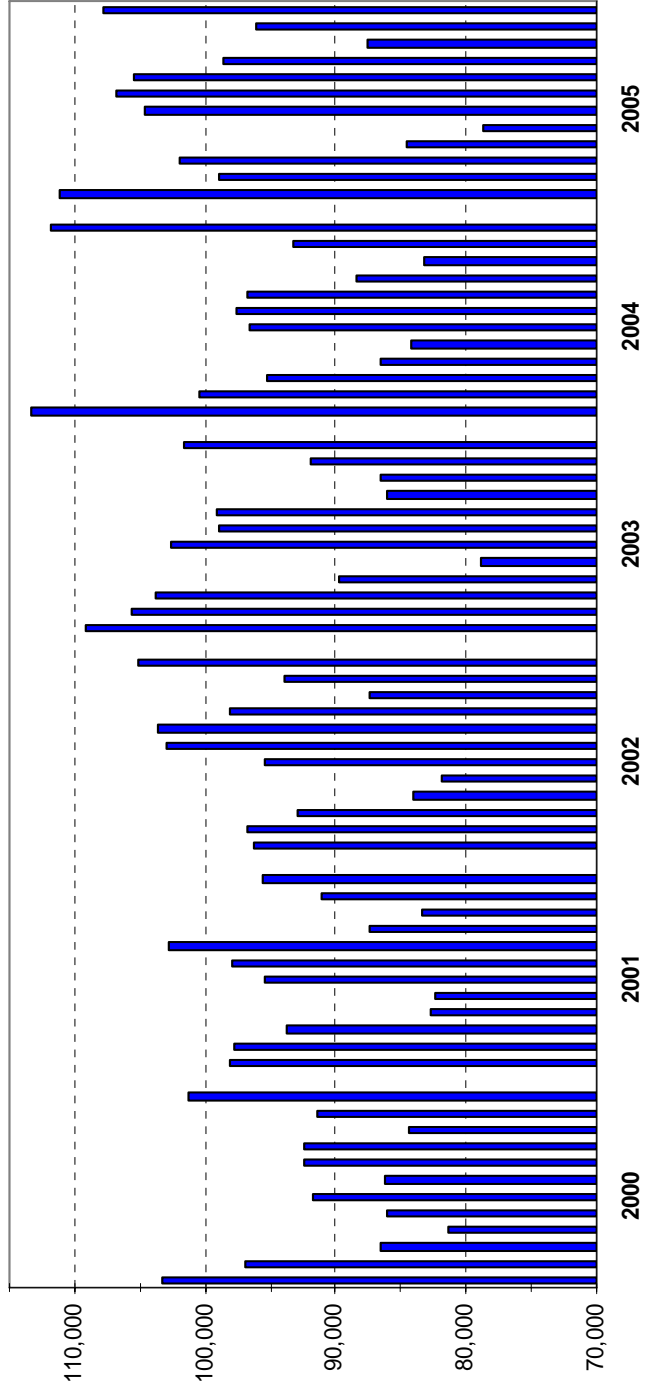
NPCC was originally formed as a voluntary, nonprofit regional electric reliability organization in January 1966 shortly following the Northeast Blackout of November 9, 1965. NPCC is one of eight Regional Reliability Organizations located in North America. In response to U.S. energy legislation (EPAAct 2005 signed into law August, 2005) and in preparation for the certification of an Electric Reliability Organization (ERO) in 2006 and subsequent execution of a Regional Delegation Agreement (RDA) and Memorandums of Understanding (MOUs) with appropriate Canadian Provincial regulatory and governmental authorities, NPCC has restructured. The Membership interests in NPCC have been transferred to a regional reliability assurance not-for-profit corporation, NPCC Inc., and a separate and independent, affiliated, not-for-profit corporation, NPCC: Cross-Border Regional Entity, Inc. (NPCC CBRE). NPCC CBRE will perform functions delegated or contracted to it from the ERO, to be backstopped by the Federal Energy Regulatory Commission (FERC) and Canadian Provincial authorities.

NPCC Inc., as the international Regional Reliability Organization (RRO) for Northeastern North America, and successor to NPCC, will provide its members regional reliability assurance services and will act as the vehicle through which States and Provinces can fulfill their political mandate to oversee the Northeastern North American electric infrastructure through development, assessment and enforcement of regionally-specific reliability criteria.

NPCC CBRE will serve as the Cross-Border Regional Entity for the Northeast with delegated functions from the ERO pursuant to an RDA and Canadian Provincial MOUs, backstopped by FERC and Canadian Provincial authorities, and a Reliability Services Agreement (RSA) intended to include activities that are in the furtherance of NERC's responsibilities as the ERO under EPAAct 2005.

Source: NPCC Load, Capacity, Energy, Fuels and Transmission Report

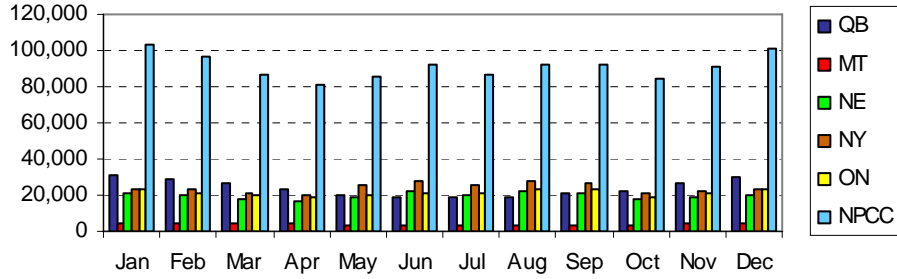
NPCC Monthly Peak Loads (MW)



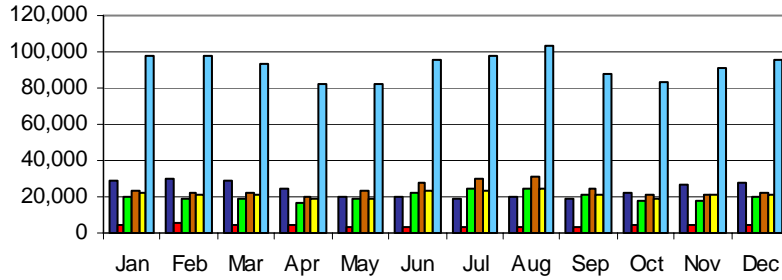
**NPCC Monthly Peak Loads (2000- 2002)**

**Source: NPCC Load, Capacity, Energy, Fuels and Transmission Report**

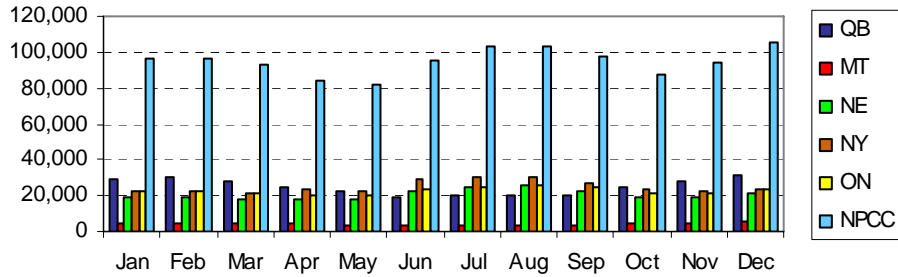
**2000 Monthly Peak Loads (MW)**



**2001 Monthly Peaks Loads (MW)**

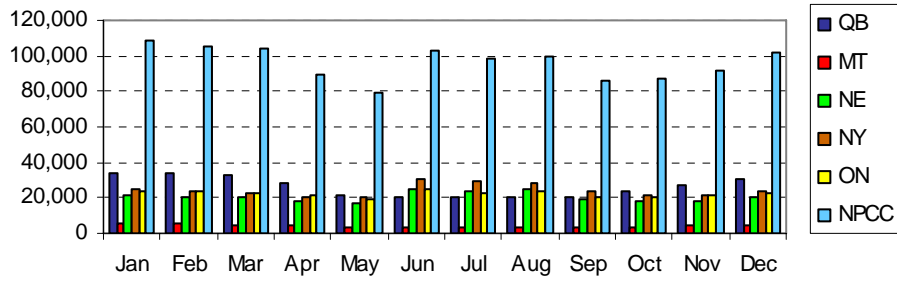


**2002 Monthly Peak Loads (MW)**

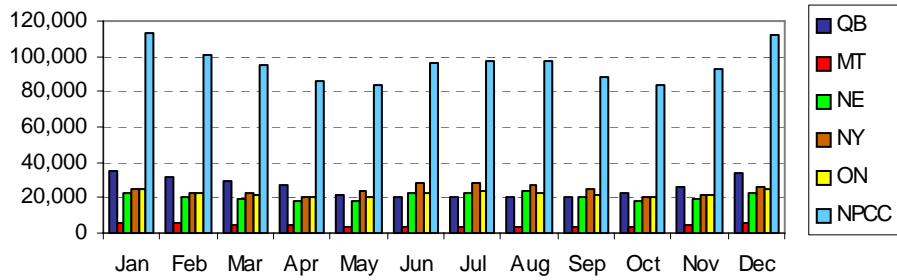


**NPCC Monthly Peak Loads (2003 - 2005)**  
**Source: NPCC Load, Capacity, Energy, Fuels and Transmission Report**

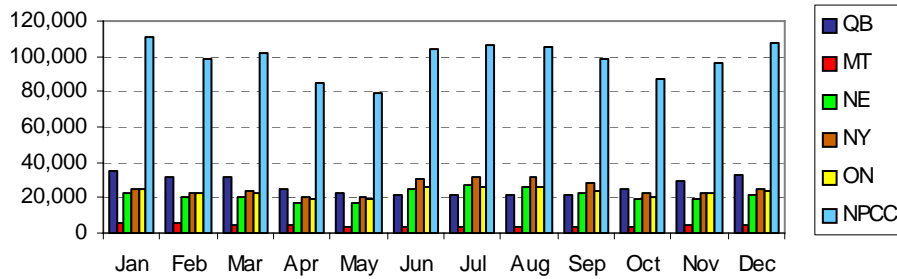
**2003 Monthly Peak Loads (MW)**



**2004 Monthly Peak Loads (MW)**

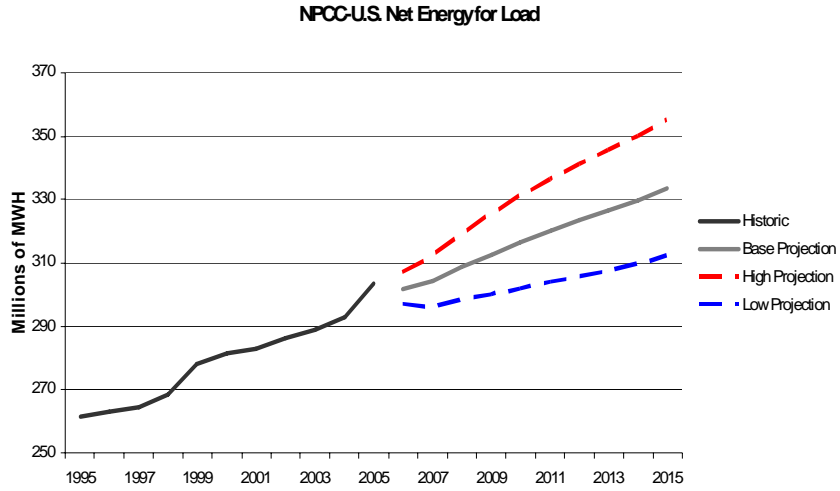


**2005 Monthly Peak Loads (MW)**



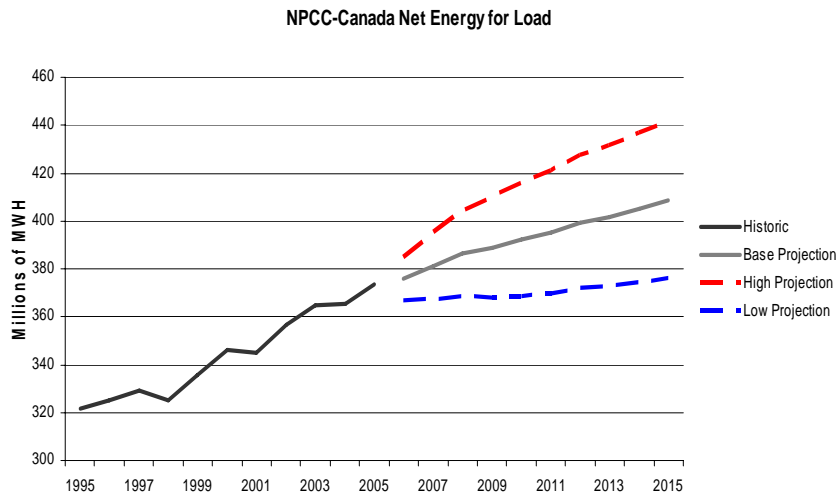
**Actual / Projected Net Energy**  
**(NPCC United States)**

Source: NERC 2006 Long-Term Reliability Assessment



**Actual / Projected Net Energy**  
**(NPCC Canada)**

Source: NERC 2006 Long-Term Reliability Assessment





## Regional Self Assessment

Source: *NERC 2006 Long-Term Reliability Assessment*

### NPCC

Due to their geographic and electrical diversity, the reliability of NPCC is monitored through the assessment of the five NPCC areas: the Maritimes (the New Brunswick System Operator, Nova Scotia Power Inc., the Maritime Electric Company Ltd., and the Northern Maine Independent System Administrator, Inc), New England (the ISO New England Inc.), New York (the New York ISO), Ontario (the Independent Electricity System Operator) and Québec (Hydro-Québec TransÉnergie). Three of these areas are summer peaking in nature: New England, New York, and Ontario. The remaining two Canadian areas, the Maritimes, and Québec, are winter peaking systems.

### *Demand*

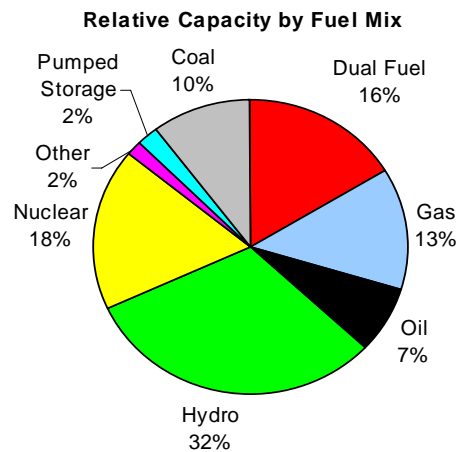
The non-coincident peak demand for the five areas of the NPCC is projected to be 142,181 MW by 2015, with an average growth of 1.4%. For the 2005–2014 study period, the non-coincident peak demand for the five areas of the NPCC was projected to be 109,980 MW by 2014, with an average growth of 1.7%.

### *Energy*

Net energy for load for the NPCC is projected to total 742,230 GWh in the calendar year 2015, with an average growth of 0.92%. For the 2005–2014 study period, net energy for load for the NPCC was projected to total 570,633 GWh in the year 2014, with an average growth of 1.23%.

### NPCC Region Capacity by Type — Summer 2006

Source: *NERC 2006 Summer Assessment*



## Regional Assessment Highlights

Source: *NERC 2006 Long-Term Reliability Assessment*

### ***New England***

Installed reserve margins will be declining throughout the study period from a high of 15% in 2008 to almost 0% in 2015. The installed reserve margins reflect firm capacity purchases of approximately 400 MW per year through 2012, approximately 330 MW purchase in 2013–2014, and approximately 110 MW in 2015. There are no generating unit retirements assumed throughout the study period and new generation totaling approximately 1,390 MW (capabilities include projects that have received proposed plan approval) is assumed to commercialize by the end of 2009.

With respect to the regional requirement, ISO New England anticipates that New England will meet the NPCC resource adequacy criterion of one-day-in-ten-years loss-of-load expectation through 2008 assuming forecasted loads and capacity materialize and 2,000 MW of tie reliability benefits are available. This is made up of 600 MW from NY, 1,200 MW from Hydro Québec, and 200 MW from New Brunswick. Existing transfer capability study results indicate that there is sufficient transfer capability with surrounding areas to receive this assistance when needed. New capacity will be needed beyond that year in order to meet the reliability criterion; approximately 170 MW needed in 2009, increasing annually and requiring a total of 4,300 MW by 2015. This assessment is based on estimated requirements calculated in the New England 2006 Regional System Plan.

### ***New York***

Given current demand projections, New York would need the addition of 4,030 MW of new resources in order to meet a projected 18% level through 2015. This projection assumes the continuation of the current level of external purchases of approximately 2,500 MW and the continuation of special case resources of approximately 1,080 MW. It is anticipated that the resources necessary to meet this projected requirement would be procured through the NYISO ICAP market. Currently, new capacity totaling 2,940 MW is under construction in New York. The generation currently under construction in conjunction with the approximately 2,500 MW of allowable external purchases will be sufficient for New York to meet an 18% reserve margin through 2015 even if no new projects are proposed.

### ***Ontario***

Since last summer, more than 600 MW of new supply has been added to the Ontario power system, which has improved Ontario's supply outlook in the short term. Under median demand growth assumptions, resources that are currently available within Ontario, together with the contracted new generation and imports, are sufficient to meet the NPCC resource adequacy criterion from 2006–2015.

## Regional Assessment Highlights

Source: NERC 2006 Long-Term Reliability Assessment

### **Quebec**

During 2006, the hydroelectric plant Eastmain-1 (480 MW) and a cogeneration plant (547 MW) near Montréal have been commissioned bringing the net installed capacity to 33,309 MW for the winter period 2006/2007. The increase in capacity from 2006/2007 to 2015/2016 is expected to be 2,633 MW. The increase comes from hydro generation plants located on various river systems. In 2006, 109.5 MW of new wind power capacity have been installed in Québec. By January 2015, the wind power installed capacity will be 3,457 MW. This wind power capacity is not included in any reliability analysis. Québec is in the process of evaluating the contribution of wind power to its capacity needs.

From 2006/2007 to 2014/2015, the internal peak load is forecasted to increase by less than 2,000 MW. Beginning in winter 2006/2007, Québec will rely on 250 MW of load management in the form of automatic voltage reduction for the winter operating period.

In the 2005 *Québec Area Triennial Review of Resource Adequacy*, Québec demonstrated that the installed reserve margin requirement was about 10% over the annual peak load to comply with the NPCC adequacy criterion. For the whole period, the expected installed reserve margin will be over this percentage. Even in the case of a high load scenario, Québec still meets the NPCC resource adequacy criterion (LOLE less than 0.1 day/year).

### **Maritimes**

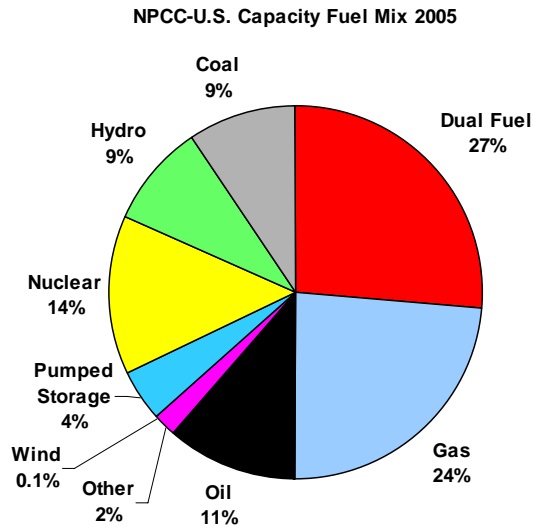
The Maritimes area is a winter peaking area that includes the New Brunswick System Operator (NBSO), Nova Scotia Power Inc. (NSPI), Maritime Electric Company Ltd. (MECL), and the Northern Maine Independent System Administrator, Inc (NMISA). The MECL supplies the province of Prince Edward Island.

The NBSO and NSPI individually apply a capacity based criterion of 20% in determining their required reserve, while MECL uses 15%. NMISA does not apply a capacity based criterion beyond the NPCC reliability criterion. Since NBSO and NSPI comprise about 94% of the Maritimes area load, this effectively produces a required reserve of 20% for the Maritimes. This reserve requirement is to accommodate both peak demand uncertainty and generation availability uncertainty.

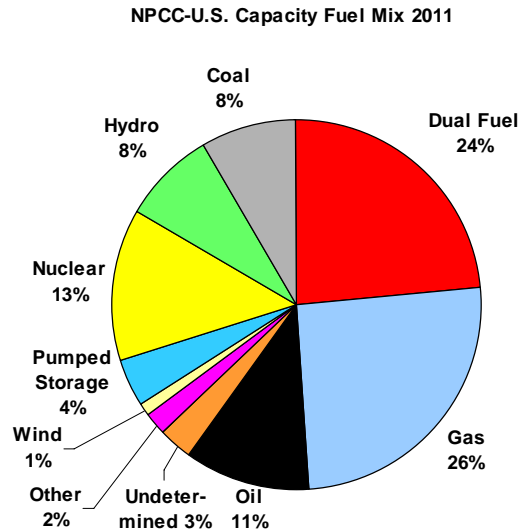
The planned refurbishment of the 635 MW Point Lepreau nuclear facility in New Brunswick will require an outage of eighteen months, beginning in April 2008, with completion scheduled for November 2009. Due to this outage, the Maritimes area will require 20 MW of additional capacity to meet the NPCC resource adequacy criterion. Plans for replacement capacity to accommodate this refurbishment are still being evaluated by NB Power.

200 MW of firm capacity will be sold to Québec until 2010/11. The Maritimes does not depend upon outside purchases to meet demand requirements.

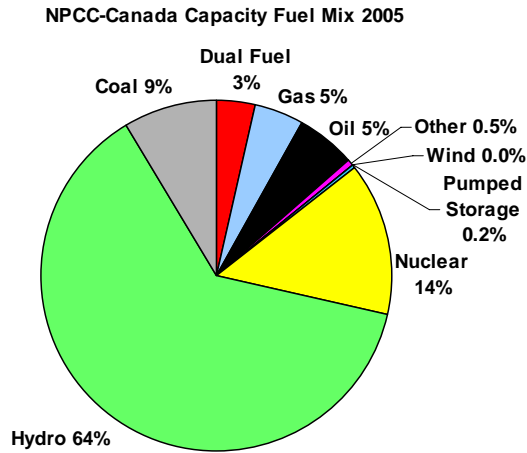
**NPCC US Capacity Fuel Mix — Summer 2005**  
**Source: NERC 2006 Long-Term Reliability Assessment**



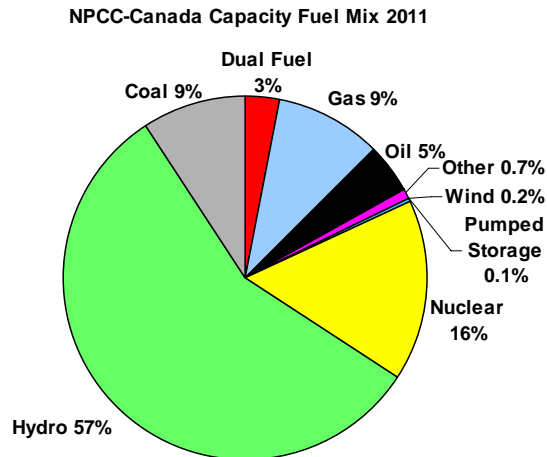
**NPCC US Projected Capacity Fuel Mix — Summer 2011**  
**Source: NERC 2006 Long-Term Reliability Assessment**



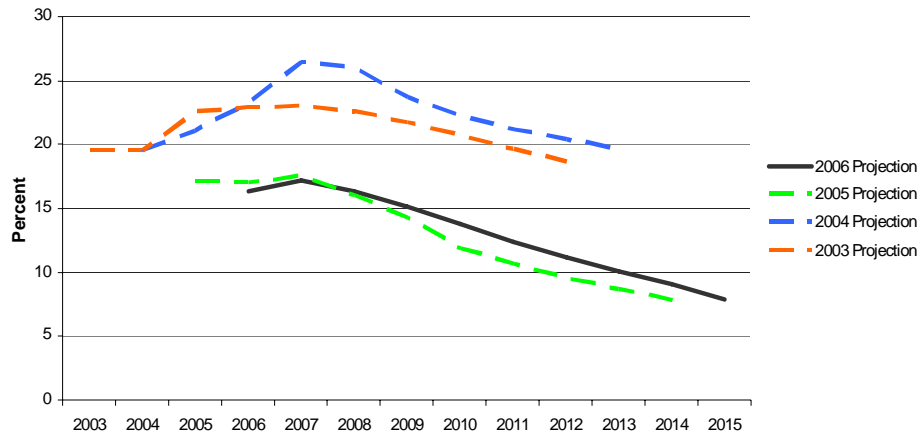
**NPCC Canada Capacity Fuel Mix — Summer 2005**  
 Source: NERC 2006 Long-Term Reliability Assessment



**NPCC Canada Projected Capacity Fuel Mix — Summer 2011**  
 Source: NERC 2006 Long-Term Reliability Assessment

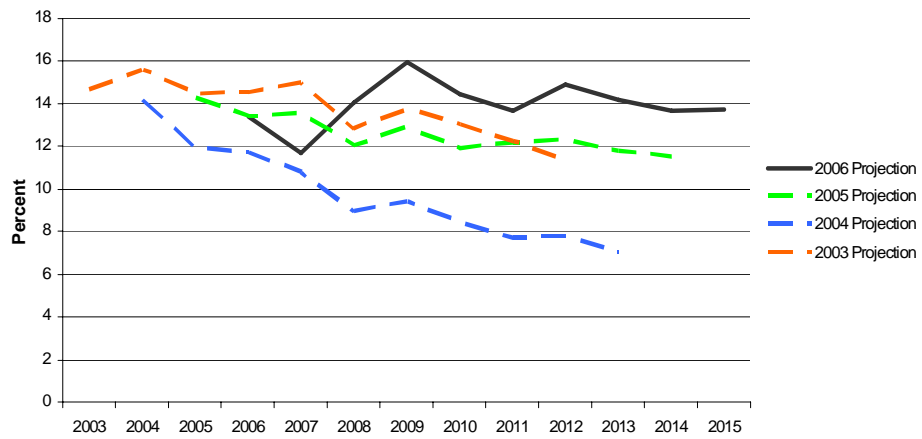


NPCC-U.S. Capacity Margins - Summer

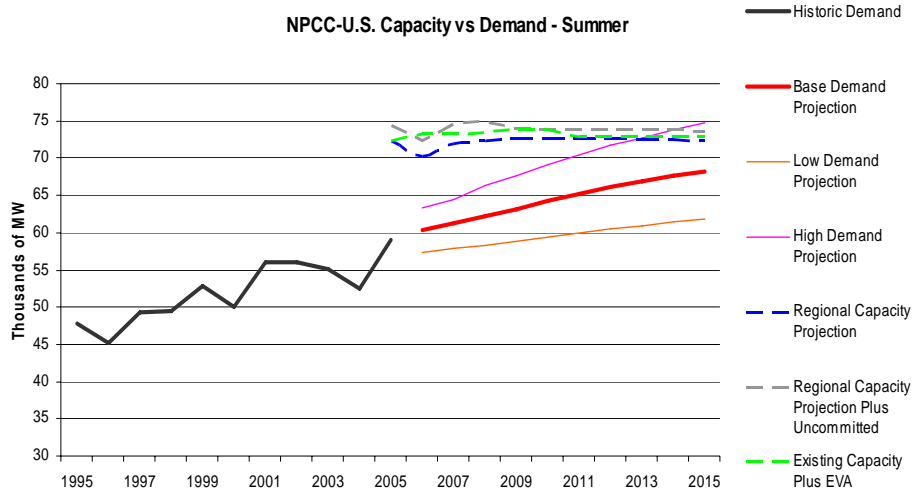


Source: NERC 2006 Long-Term Reliability Assessment

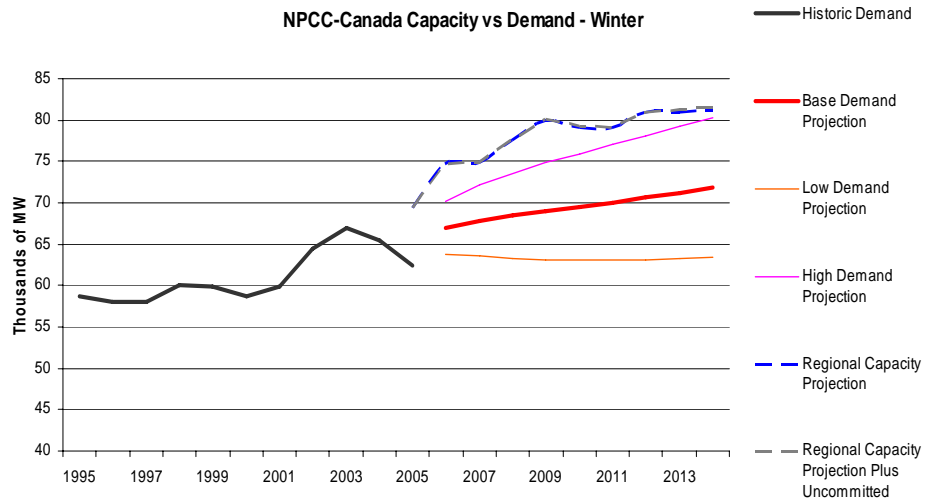
NPCC-Canada Capacity Margins - Winter



Source: NERC 2006 Long-Term Reliability Assessment



**Source: NERC 2006 Long-Term Reliability Assessment**



**Source: NERC 2006 Long-Term Reliability Assessment**

**NPCC Area Transmission Expansion Summary**  
**Source: NERC 2006 Long-Term Reliability Assessment**

**Maritimes**

Construction of a second 345-kV interconnection between New Brunswick and New England is scheduled to be in service by December 2007, connecting Point Lepreau, New Brunswick to Orrington, Maine. As a result of this project (including series and shunt capacitors in Maine), the maximum transfer capability between New Brunswick and New England is increased from 700 MW to 1,000 MW, and the import capability from New England to New Brunswick is expected to be raised from 100 MW to 400 MW.

**New England**

Much progress has been made toward completing transmission upgrades identified in previous Regional System Plans, ranging from substation improvements to new 345 kV circuits. Major new 345 kV projects under construction in 2006 include the following:

**Northeast Reliability Interconnection (NRI) Project**—includes a new 144-mile, 345 kV transmission line and supporting equipment to connect the Point Lepreau substation in New Brunswick, Canada, to the Orrington substation in northern Maine. The facility owners anticipate that the project will be in service by the end of 2007.

**Northwest Vermont Reliability Project**—The project consists of a new 36-mile, 345 kV line, a new 28-mile, 115 kV line, additional phase-angle regulating transformers (PARs), two dynamic voltage-control devices, and static compensation. The Vermont Electric Power Company (VELCO) estimates the in-service dates for various components of this project range from late 2006 through 2007.

**NSTAR 345 kV Transmission Reliability Project**—addresses the reliability needs in the Boston area and increases the Boston-import transfer capability by approximately 1,000 MW. This project includes the construction of a 345 kV substation in Stoughton and the installation of three new underground 345 kV lines: one 17-mile cable to K Street Substation, one 11-mile cable to Hyde Park Substation, and a second 17-mile cable to K Street Substation. NSTAR anticipates that the first portion of this project will be completed in 2006, and the final cable will be completed in 2007.

**Southwest Connecticut Reliability Project**—Phase 1 includes a 20-mile 345 kV circuit from Bethel to Norwalk, which Northeast Utilities plans to put in service in 2006. Phase 2 includes a 70-mile 345 kV circuit from Middletown to Norwalk, which transmission owners plan to put in service in 2009. Southwest Connecticut also requires a pair of new 115 kV lines from Norwalk to Glenbrook, planned to be in service in 2008.



### ***New York***

Based on the present load forecast, planned transmission facilities, and projected generation resources, including proposed generation additions and associated transmission upgrades, the New York bulk power transmission system is judged to be adequate through 2015. Significant transmission projects currently being proposed include the Sayerville to West 49th Street HVDC interconnection with PJM expected for 2007. The circuit and transformer upgrades planned from Sprainbrook to Sherman Creek substations will increase in internal New York transfer capability into New York City by 350 MW in 2007.

### ***Ontario***

Transmission capability into the greater Toronto area (GTA) has been enhanced over the past year with the addition of the second 500/230 kV, 750 MVA auto-transformer at the Parkway TS in the fall of 2005, a 240 Mvar shunt capacitor at the Essa TS and the planned removal of deratings on the 500/230 kV, 750 MVA autotransformer at the Trafalgar TS.

Imports from New York were limited at times by transmission constraints internal to Ontario in the summer of 2005. These limitations are being addressed by augmenting the five existing 230-kV circuits between Niagara Falls and Hamilton that form the Queenston Flow West interface with a new 230-kV double circuit line between the Allanburg TS and the Middleport TS. This expansion project, together with improved 230-kV circuit ratings in the Burlington area, will remove these internal restrictions. New York imports are expected to be limited by the ties to New York, with a net increase in import capability of about 350 MW. In addition, an existing special protection system at St. Lawrence is planned to be enhanced and be available under peak load conditions to maximize simultaneous import capability from Hydro-Québec and New York. These changes, targeted for the summer of 2006, will increase Ontario's ability to import from New York.

A number of other transmission reinforcements are being developed to permit the connection of new generation to the Ontario system. Most significant of these is the need to increase 500-kV transmission capability from the area around the Bruce nuclear plant to accommodate the return of the two nuclear units and new supply from up to 1,000 MW of wind. The final arrangements have not been decided, but they will need to be in service by 2012 to avoid delaying the restart of the nuclear units.

### ***Québec***

During the next five years, about 450 miles of new transmission lines will be added to the Hydro-Québec TransÉnergie grid. The major focus of the new transmission will be the integration of additional generation provided by wind farms and hydroelectric projects with the main grid. Moreover, the Gaspesia subsystem will be reinforced to integrate around 1,500 MW of wind generation.

Presently, the integration of a new HVdc link in the Outaouais subsystem is being studied. This HVdc link is planned to have a capability of 1,250 MW and would be connected to the Ontario grid. A scenario under study is considering a commissioning for the end of 2009.

## **NPCC Membership**

Central Hudson Gas & Electric  
Corporation

Central Maine Power Company

Cinergy Services, Inc.

Consolidated Edison Company of  
New York, Inc.

Consolidated Edison  
Energy/Development, Inc.

Constellation Energy Commodities Group, Inc.

Dominion Energy Marketing, Inc.

Entergy Nuclear Northeast, Inc.

Exelon Corporation

FPL Energy, LLC

Hydro One Inc.

Hydro-Québec Distribution

Hydro-Québec Production

Hydro-Québec TransÉnergie

Independent Electricity System  
Operator (Ontario)

ISO New England, Inc.

Long Island Power Authority

National Grid USA

New Brunswick Power  
Transmission

New Brunswick System Operator

New York Independent System  
Operator

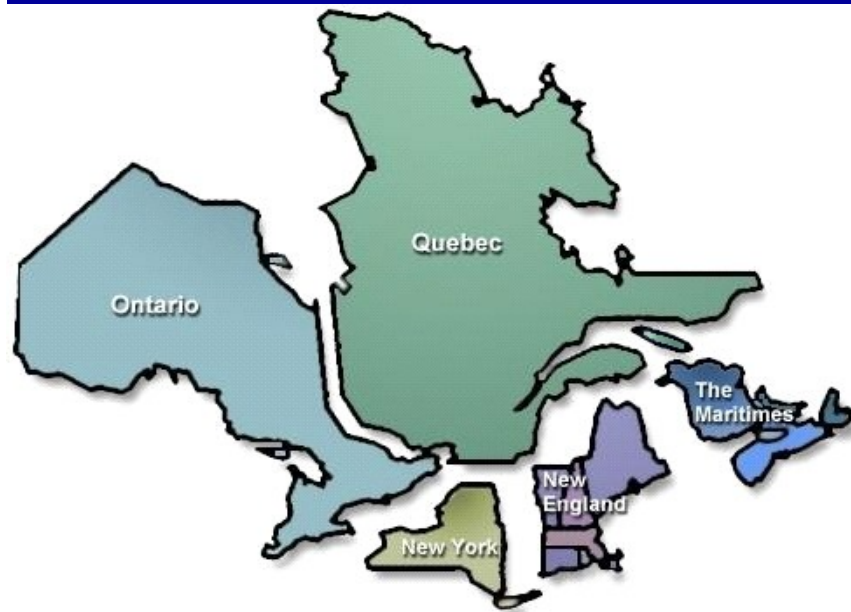
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## **NPCC Membership**

New York Power Authority  
New York State Electric & Gas  
Corporation  
New York State Reliability  
Council, LLC  
Northeast Utilities  
Nova Scotia Power Incorporated  
NSTAR Electric  
Ontario Power Generation, Inc.  
PPL, EnergyPlus, LLC  
Rochester Gas & Electric  
Corporation  
The United Illuminating Company, Inc.  
Vermont Electric Power Company, Inc.

### **Public Interest Members**

Maine Public Utilities Commission  
New England Conference of  
Public Utility Commissioners, Inc.  
New York State Department of  
Public Service  
Ontario Energy Board  
Québec Energy Board  
Vermont Department of Public  
Service



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