

 Public Service
of New Hampshire
A Northeast Utilities Company

Regional Energy Outlook:

Meeting the Energy Challenges Facing New England

Gary Long, President
NH Renewable Energy Policy Development
Northeast Utilities

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New England is One Power Grid - No State Stands Alone

-  Electricity is pooled and shared among all New England consumers
-  Region has about 31,750 MW of capacity, all-time peak demands of 28,130 MW
-  Market overseen by ISO-NE, a private, non-profit administrator regulated by the federal government
-  Energy supply and price volatility is felt by all New England consumers



Source: ISO-New England

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What Happened This Winter?

- New England is experiencing significant energy challenges
 - Natural gas supply is contracted primarily for home heating, not electricity generation
 - More costly, non-gas electric generation must fill the gap
- Natural gas and wholesale electric prices have skyrocketed
- Retail customers are beginning to see the price impacts
- Situation is projected to worsen until new and diverse energy sources are developed

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Headlines Highlight the Region's Energy Supply Challenges this Winter

"Frigid Winter Leading to Big Bills for Natural Gas"
- *Portland Press Herald, February 26, 2014*

"Natural-Gas Prices Spike as Forecasts Turn Colder Again"
- *Wall Street Journal, February 19, 2014*

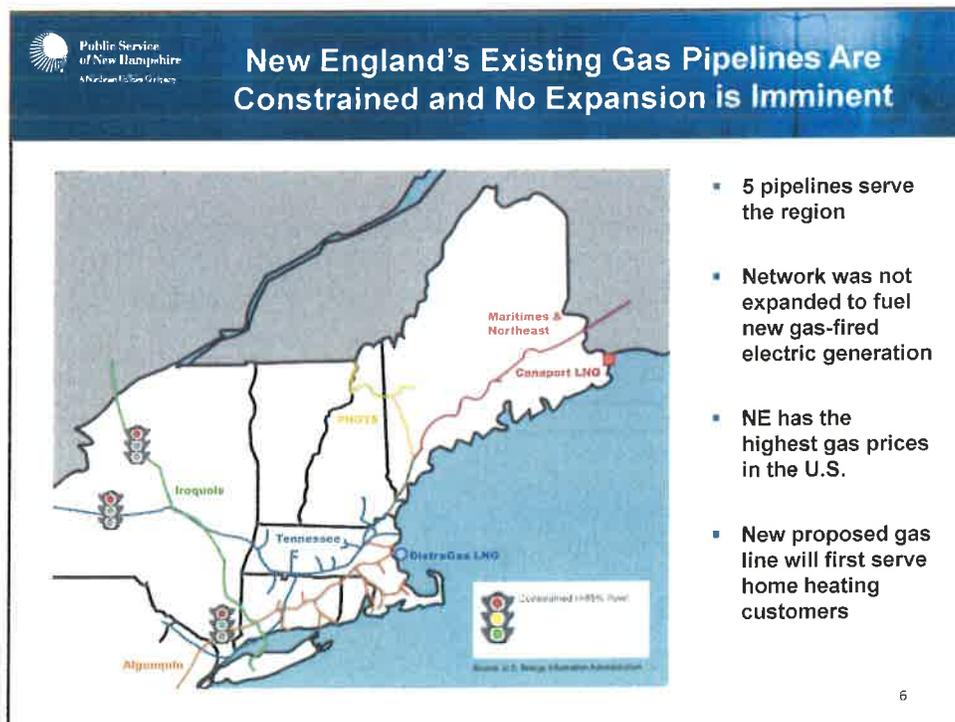
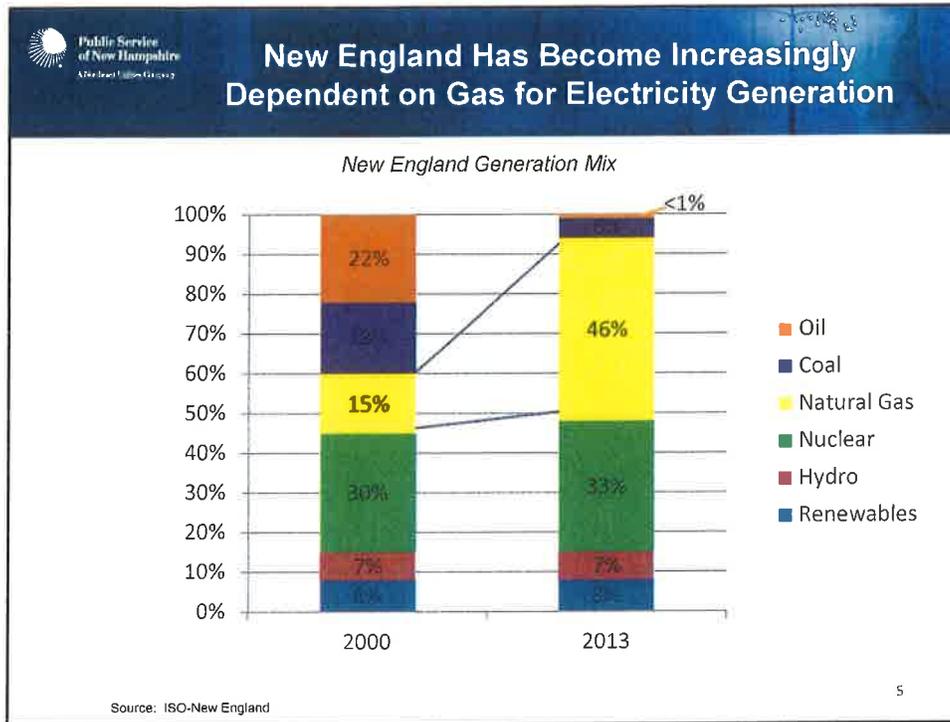
"Report: Gas Pipeline Not Enough to Avert New England Energy Crisis"
- *Union Leader, February 17, 2014*

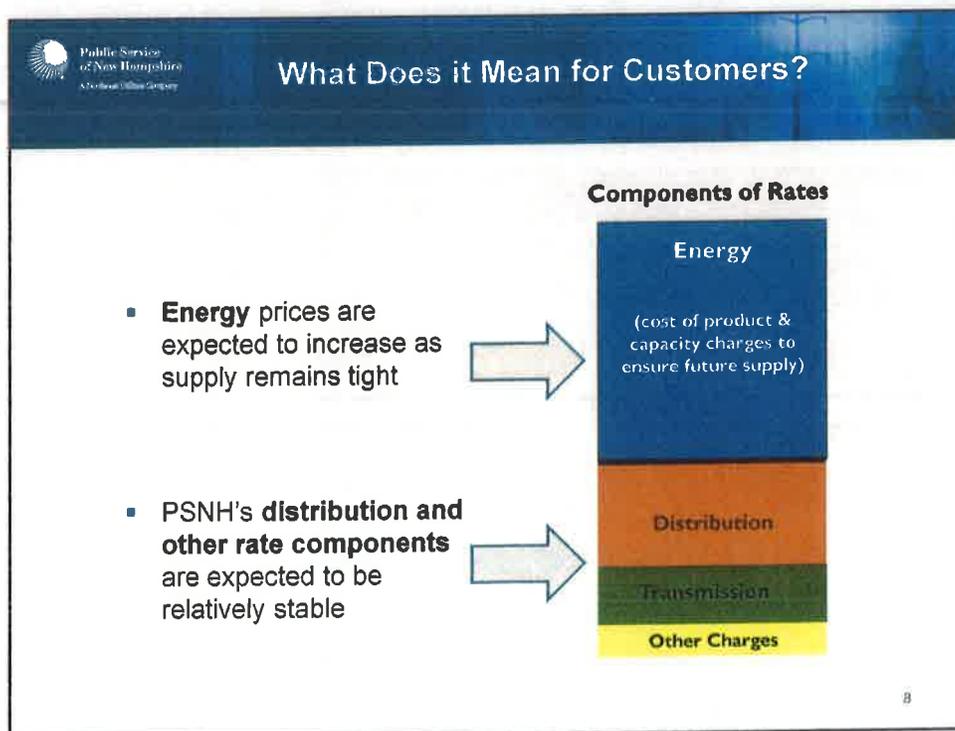
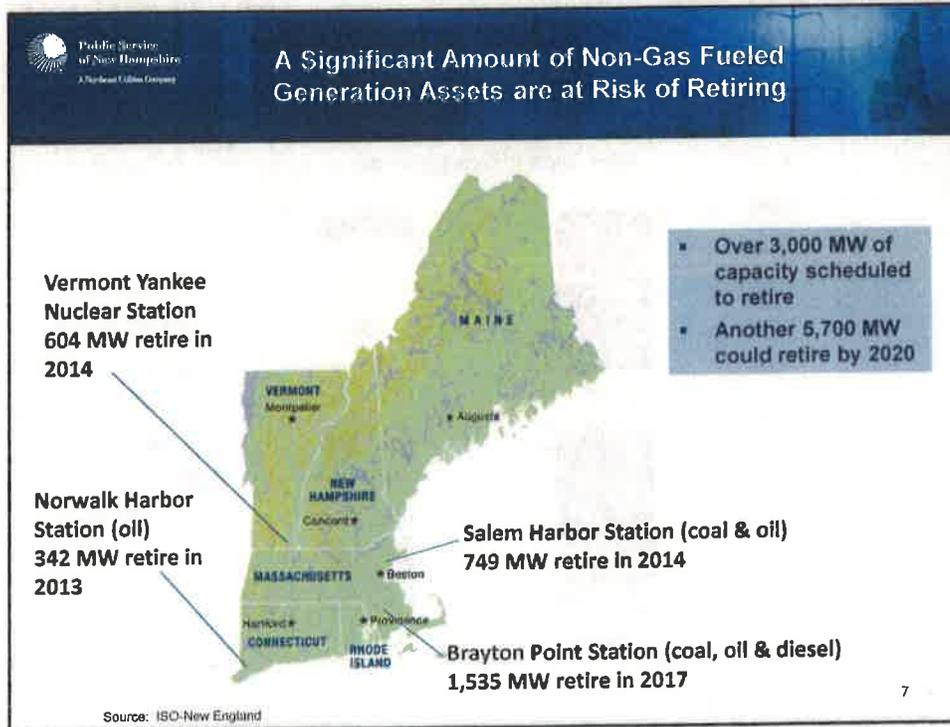
"New England Power Plant Closings Pinching Supply"
- *Concord Monitor, February 5, 2014*

"Frozen Northeast Getting Gouged by Natural Gas Prices"
- *Bloomberg Businessweek, January 27, 2014*

"New England Energy Prices 40% Above US Average"
- *Union Leader, January 9, 2014*

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PSNH is Pursuing Solutions for New Hampshire's Customers

- Operate and maintain existing generation assets
- Pursue energy efficiency opportunities
- Construct Northern Pass Project
- Pursue additional electric and gas infrastructure envisioned by New England Governors

The Northern Pass ENERGY BRIEF

March 27, 2014
Issue 4

The Numbers Are In: Support for Northern Pass Growing

Support for Northern Pass continues to grow! An independent issues survey released earlier this week finds the strongest support yet for the project, with 46 percent of New Hampshire residents supporting the project and just 35 percent opposing it. The results are in line with what we have been hearing through our outreach efforts in recent months, and offer further proof that – the more people learn about Northern Pass, the more likely they are to support it.

Reading into the data gives a clearer picture of what kind of energy future New Hampshire residents want and how they want to get there. For instance:

- Only 28 percent of those polled favor burying the Northern Pass given the dramatically higher costs of underground technology, and only 19 percent are willing to pay for the increased costs through a ratepayer charge.
- 64 percent of residents polled support the idea that New Hampshire should diversify its energy portfolio by adding sources other than natural gas.
- Just 31 percent of New Hampshire residents back a new natural gas pipeline and only 23 percent are willing to pay for the construction of a new pipeline.

These results will no doubt prompt policy makers to reconsider some of the popular misconceptions surrounding energy projects, and the actual concerns expressed by the public.

Figure 10: Northern Pass Support Tracking Data



This chart, taken from the Greater Nashua Chamber of Commerce 2014 Public Opinion Survey, shows growing support and declining opposition to Northern Pass.

Source: Greater Nashua Chamber - <http://www.nashuachamber.com/advocacy/legislativesurvey/>

To receive this Energy Brief electronically, please email Lauren Collins, Northern Pass Media Specialist: lauren.collins@nu.com or visit blog.northernpass.us

New England's governors have called for the construction of both new natural gas pipeline and transmission lines, and they envision utility customers paying for these projects. The potential for public funding for the construction of energy projects is now, as one Vermont official predicted, drawing developers "out of the woodwork" with costly proposals designed to help New England meet its energy goals. It is clear these projects are needed, yet it's also evident that the public has concerns about picking up the tab.

And here is where Northern Pass is different. As proposed, Northern Pass is a "merchant" or "participant-funded" project. This means that, under the current plan, customers won't pay for the construction of the line. The cost of building long-distance underground transmission lines (five to ten times higher than overhead construction) has the potential to make a participant-funded projects uneconomic. This is one of the reasons why just 0.5 percent of all transmission lines in the country are underground.

New Hampshire residents have spoken. They want to add new sources of clean, renewable energy to the grid, and in a cost-efficient manner. Northern Pass will not only connect our grid to a major source of hydropower, it can also plug New Hampshire into its energy future.

HEADLINES

ALL SIX NEW ENGLAND GOVERNORS COMMIT TO JOINT ENERGY INFRASTRUCTURE AGENDA

- Bangor Daily News

NEW ENGLAND STATES COMMITTEE ON ELECTRICITY LETTER TO ISO NEW ENGLAND

- Request for help in developing "tariff filings related to electric and natural gas infrastructure in New England."

NEW ENGLAND STATES DEBATE SHARING COSTS FOR NEW POWER LINES

- Vermont Public Radio

COMPANIES WANT TO BUILD MULTIMILLION-DOLLAR POWER LINES THROUGH MAINE

- Portland Press Herald

OUT OF SIGHT, OUT OF MIND 2012

- Edison Electric Institute

POWER OUTAGES OFTEN SPUR QUESTIONS AROUND BURYING POWER LINES

- US Energy Information Administration

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The Northern Pass ENERGY BRIEF

March 2014, Issue 3

When Higher Energy Costs Hit Home

You check the mailbox: a few advertisements, some 'too good to be true' offers, and bills. There's your mortgage, your car payment, your electricity bill and maybe your home heating bill. Which ones have been causing you to wince lately when you open them? Chances are the last two.

What you may not realize when you slide your finger under the envelope flap is the relationship between the numbers in those bills and a significant debate that is taking place on our energy future. How things like pipeline and transmission lines, fossil fuels and renewable resources, trickle down over time to the line that reads "amount due."

Energy analysts and policy makers have been talking all winter about constrained natural gas pipelines, over-dependence on natural gas and the region's high energy prices. We saw this week the affect these issues have on the people who live and work in New England.

New England now pays the highest average spot price for natural gas in the country, despite the region's proximity to the Marcellus Shale natural gas fields in West Virginia, Pennsylvania, and New York. The higher cost of natural gas is increasing the cost of electricity, moving wholesale prices up 55 percent higher in 2013 than they were the year before. Natural gas prices are also contributing to higher home heating costs in New England. The average home heating bill increased \$300 this winter, to about \$1,700. Businesses say these added costs are putting a drag on the economy.

ISO-NE President and CEO Gordon van Welie, speaking recently in Washington, D.C., said the region will be in a "precarious operating position" in the next three to four years, and that the energy problems New England faced this winter will only get worse next winter because more power plants are retiring this year.

It's clear that adding more energy from a variety of sources to the regional grid will lower costs and ensure reliability. All six New England governors have acknowledged the importance of Canadian hydropower in a well-rounded energy mix, as did the Boston Sunday Globe last weekend when it endorsed Massachusetts legislation that would encourage the importation of more hydropower into our regional power grid. Northern Pass is already years ahead of whatever new proposals might now emerge, with a secured route and a federally-approved funding plan. It's a project well positioned to help the region address these energy challenges.

REPORT: NATURAL GAS PRICE HIKES PUSHED ELECTRIC RATES HIGHER IN 2013

NEW HAMPSHIRE UNION LEADER - MARCH 18, 2014

Rising prices for natural gas delivered to New England pushed wholesale electricity prices in the region up by 55 percent over 2012, according to preliminary figures from ISO New England, the operator of the region's wholesale electricity markets.

Natural gas is the predominant fuel used to generate the region's electricity — about 46 percent of total generation in 2013 — so wholesale power prices tend to track the price of natural gas, according to ISO spokeswoman Marcia Blomberg.

"Pipeline constraints, particularly in winter when home heating needs raise demand for natural gas, have pushed up the average spot price for natural gas in New England to the highest in the country," said Blomberg. "Until new infrastructure alleviates these pipeline constraints, prices for natural gas and wholesale electricity are likely to remain volatile."

Gov. Maggie Hassan said she and the five other New England governors met with ISO and representatives of the Federal Energy Regulatory Commission (FERC) on the idea when they were in Washington earlier in the month for the winter meeting of the National Governors Association.

"There are a number of considerations that we need to address, but we are all working together on that," she said. "It's fair to say both the folks at ISO and FERC understand that this is a priority and that they need to be helping us to address it."

The full article is available at: <http://www.unionleader.com/article/20140319/NEWS05/140318948>

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ON ENERGY, WE CAN'T SIMPLY KEEP SAYING "NO"

CONCORD MONITOR - MARCH 14, 2014

New Hampshire is in the middle of a serious debate over whether or not to embrace wind and hydroelectric power projects. We must make decisions today that will enhance our national and global competitiveness for future generations – and a major part of that competitiveness is the future cost and reliability of energy.

We simply can't keep saying "No" to all these projects. Doing nothing may be a short-term political victory for some, but in the very near future, these myopic decisions will ultimately end in crisis.

The full article is available at: <http://mobile.concordmonitor.com/home/11100385-108/my-turn-on-energy-we-cant-simply-keep-saying-no>

HIGHER COST OF KEEPING WARM A DRAG ON THE ECONOMY

BOSTON GLOBE - MARCH 17, 2014

This long, cold winter has forced households across New England and the Northeast to spend an estimated 20-percent more for heat. The average winter heating bill in New England is expected to climb nearly \$300, to about \$1,700 from \$1,400 last season, according to the National Energy Assistance Directors' Association, a professional group in Washington.

"If you are using heating oil or propane, this is truly an emergency for you," said Mark Wolfe, executive director of the National Energy Assistance Directors' Association.

The full article is available at: <http://www.bostonglobe.com/business/2014/03/16/heating-bills-rise-putting-squeeze-consumers-economy/pWTm1qYhMZ6Q4nVpttpQxO/story.html>

STATE TO DISTRIBUTE \$20 MILLION IN HEATING AID

BOSTON GLOBE - MARCH 17, 2014

Massachusetts lawmakers approved the release of \$20 million in heating aid for low-income households — the first time in three years that the state has provided such assistance.

"This has been one of the coldest winters in recent memory and even halfway through March the temperature is still below 30 degrees," Senate President Therese Murray said in a statement. "The already high cost of energy continues to rise and many families are struggling to make ends meet."

The full article is available at: <http://www.bostonglobe.com/business/2014/03/17/state-distribute-million-heating-aid/hShBX41hL0gYMvbkzvTzvl/story.html>

YEARS AFTER THEY WERE PROPOSED, R.I., MASS., WIND PROJECTS YET TO START SPINNING

PROVIDENCE JOURNAL - MARCH 15, 2014

In 2009, The Providence Journal wrote about the race to build the first offshore wind farm in the United States, with projects off Block Island and Cape Cod at the front of the pack. Five years later, the race continues.

The full article is available at: <http://www.providencejournal.com/breaking-news/content/20140315-years-after-they-were-proposed-r.i.-mass.-wind-farm-projects-yet-to-start-spinning.ece>

NEW ENGLAND'S WHOLESALE ELECTRIC PRICES SOARED BY 55 PERCENT LAST YEAR

BOSTON BUSINESS JOURNAL - MAR 18, 2014

ISO New England reported today that the volatile natural gas market in this region pushed wholesale electric prices up by 55-percent last year. We're already seeing some of this at the retail level, but the real impact will likely be seen in our monthly bills next winter. Driving this increase is a 76-percent jump in natural gas prices in New England over the same time frame.

The full article is available at: http://www.bizjournals.com/boston/blog/mass_roundup/2014/03/new-englands-wholesale-electric-prices-soared-by.html?page=all

MASS. MUST WELCOME HYDRO-POWER EVEN AS IT PROMOTES WIND, SOLAR

BOSTON SUNDAY GLOBE - MARCH 16, 2014

A new bill before the Massachusetts Legislature, backed by the Patrick administration, finally strikes the right balance. The legislation invites more Canadian hydropower into New England, without making it eligible for the full range of supports reserved for the cleanest energy sources. The Legislature should approve it.

The full article is available at: <http://www.bostonglobe.com/opinion/editorials/2014/03/16/mass-must-welcome-hydropower-even-promotes-wind-solar/50ZQ90wTL3faEZVzU9AGoK/story.html>



OVERVIEW OF THE NORTHERN PASS PROJECT



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WHAT IS THE NORTHERN PASS?

- › The Northern Pass is a proposed transmission line that will bring 1,200 megawatts (MW) of low-cost, clean, reliable energy (primarily hydropower) from Canada to New Hampshire and New England—enough renewable electricity to power one million homes.
- › The project will use 147 miles of existing rights-of-way, develop 32.25 miles of new rights-of-way, and construct two sections of underground transmission—a 2,300 foot section for the Route 3 crossing in Pittsburg and Clarksville and a 7.50-mile section within town and state road corridors in portions of Stewartstown and Clarksville.
- › Direct current (DC) electricity will travel from Canada to a converter terminal in Franklin, New Hampshire, where it will be converted to alternating current (AC) electricity. The AC power will then travel to an existing electric substation located in Deerfield, New Hampshire, and will be distributed throughout New Hampshire and New England.

WHAT ENVIRONMENTAL BENEFITS WILL THE NORTHERN PASS BRING TO NEW HAMPSHIRE?

- › Reduces regional carbon dioxide emissions by up to 5 million tons a year—equivalent to eliminating the annual emissions of nearly 900,000 cars.
- › Complements the development and operation of local renewable energy sources, such as wind and solar, which operate intermittently.
- › Helps meet state and regional air quality goals by displacing fossil fuel generation.
- › Since the project does not qualify under New Hampshire's Renewable Portfolio Standards law, it will not threaten other local renewable energy projects that are dependent on subsidies.

WHAT ARE THE ECONOMIC BENEFITS TO NEW HAMPSHIRE?

- › 1,200 new jobs over the construction period.
- › \$20-\$35 million annual energy cost savings for New Hampshire consumers.
- › An estimated \$28 million annually in new local, state and county tax revenues.
- › A unique "participant funded" approach, where customers will not be charged for the cost of the project. Project participants will recover their costs by selling energy into the market at a competitive price.
- › A renewable energy project that does not require a consumer subsidy, in contrast to other New England renewable energy projects, such as wind and solar.

WHY IS THE NORTHERN PASS NEEDED?

- › New Hampshire is part of the New England power grid—drawing from a regional energy supply—and demand in the state and region has increased steadily over the past 10 years. ISO New England, the operator of the regional power grid, predicts an increase of 17% in peak demand in the state over the next decade.
- › New England's growing dependence on natural gas is an ongoing concern for state and federal officials who believe that a diverse energy portfolio ensures stability from both economic and reliability perspectives. Certain oil-fired and nuclear generators could retire within the next five years, and coal-fired plants are subject to ever-more-stringent environmental regulations—highlighting the need for additional sources of energy.
- › State and federal policies continue to favor cleaner and more reliable energy sources. For example, New Hampshire's Climate Action Plan recommends additional importation of hydroelectric and wind power from Canada.
- › Access to this energy will help guard against fuel shortages and price volatility.

THE NORTHERN PASS PROJECT

WHAT IS THE CURRENT STATUS OF THE NORTHERN PASS?

- The amended application submitted to the U.S. Department of Energy explains the proposed route and continues the rigorous federal review process.
- A permit application will be filed with the New Hampshire Site Evaluation Committee (SEC) in 2014, which will initiate the state permitting process and provide further opportunities for public input.
- Collectively, these comprehensive state and federal permitting processes are expected to last up to two years, and will offer many opportunities for public comment.
- In addition, the project will increase its community outreach efforts in the weeks and months ahead—meeting with communities, state leaders and concerned citizens.
- The project will host a series of open house events in towns near and along the transmission line. The public will have opportunities to speak to project engineers and environmental experts, view visual simulations, and ask questions about everything from structure design to line location.



Facts at a Glance: NEW NORTH COUNTRY RIGHTS-OF-WAY

Population of Towns on Rights-of-Way*

Old Proposal	New Proposal
8,230	2,477

Number of Properties with Overhead Lines

Old Proposal	New Proposal
186	31

Distance of New Rights-of-Way

Old Proposal	New Proposal
40 miles	32.25 miles**

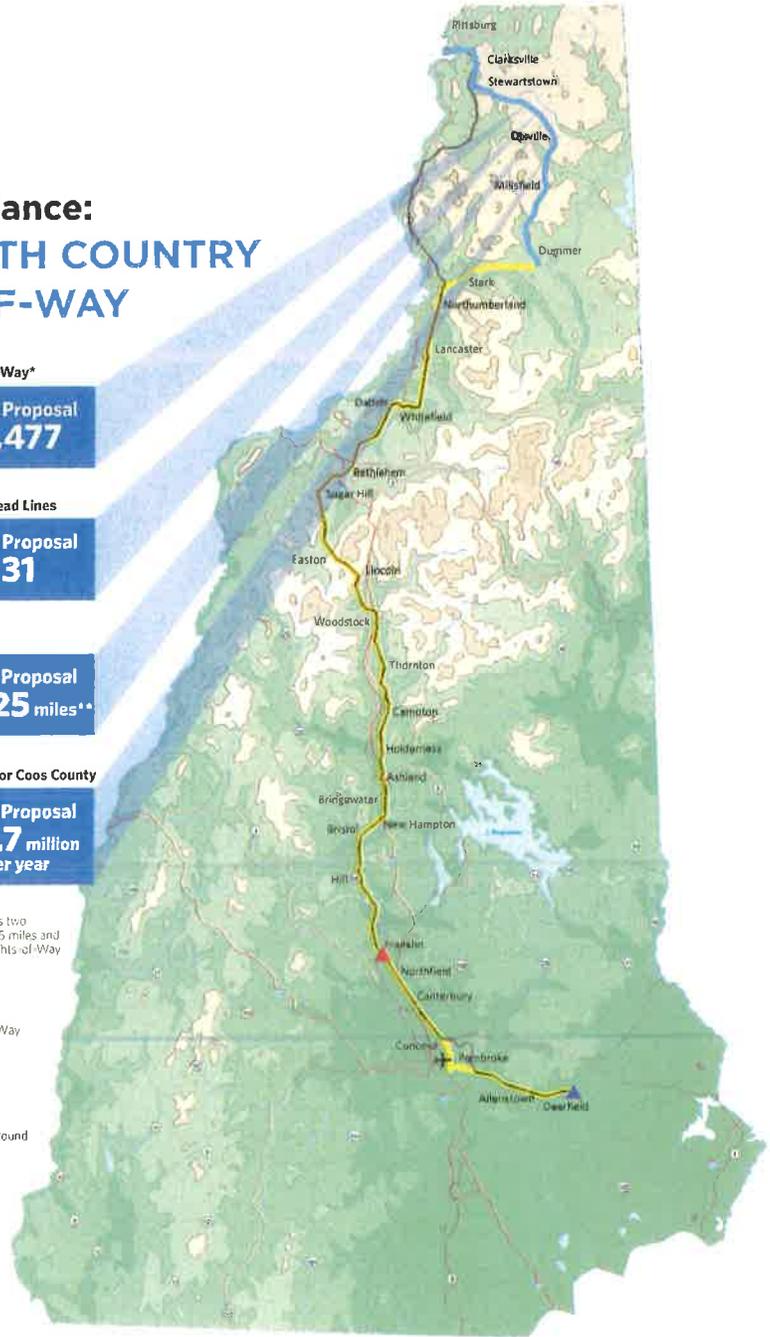
Estimated Property Tax Revenue for Coos County

Old Proposal	New Proposal
\$5.2 million per year	\$8.7 million per year

*Source: 2010 Census Data

**New North Country Route also includes two underground sections, 2300 feet and 7.5 miles and 12 additional miles of existing PSNH Rights-of-Way

- New Proposed Route — Existing Transmission Rights-of-Way (Distance = 147 miles)
- Original Proposed Route
- New Proposed Route — New Rights-of-Way and underground section (Distance = 40 miles*)
- ▲ Deerfield Substation
- ▲ Proposed Converter Station
- ✈ Concord Airport



FOR MORE INFORMATION, CONTACT: info@northernpass.us | 1-800-286-7305

Recent Warnings from New England's Electric Grid Operator, ISO-New England

Gordon van Welie, President & CEO of ISO-New England

“The challenges to grid reliability are not a question of if they will arise but of when – and when is now.” – Gordon van Welie, President and CEO of ISO-NE, in the ISO's 2014 Regional Electricity Outlook

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The Bad news is the region expects to enter the winter of 2014-2015 with a bigger deficit thanks largely to generation retirements, van Welie said.

The region will have a ‘precarious operating position’ for the next three or four years. The ISO estimates that up to 8,300 MW of non-gas-fired generation is at risk of retirement by 2020. If all of that retires, the region will need 6,300 MW of new or repowered capacity. – SNL Financial article paraphrasing Gordon Van Welie's presentation to the Infocast Transmission Summit, March 14, 2014

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"By the time we got to the end of January, we had to ... slow down the production from the oil units in order to keep some oil in the tanks because we were fearful that we would run out of oil..." — Gordon van Welie to the Infocast Transmission Summit, March 14, 2014

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“...limited pipeline capacity coming into New England means that sometimes natural gas fired generators have difficulty getting fuel, and that not only pushes up prices, it also creates a risk to reliable operation of the power system.” – Gordon van Welie in an ISO-New England press release, March 18, 2014

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“Until new infrastructure alleviates these pipeline constraints, prices for natural gas and wholesale electricity are likely to remain volatile.” – ISO-New England spokeswoman Marcia Bloomberg in the New Hampshire Union Leader, March 19, 2014



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