REAL. CLEAN. POWER.
See how we're ready to power New York into the future.
A RENEWABLE ENERGY SOLUTION FOR NEW YORK CITY

November 15, 2023
Champlain Hudson Power Express ("CHPE") – Background

Project Overview
- 1,250 MW fully buried HVDC transmission project
- Delivering 10.4 TWh/yr. of new clean energy (enough to power +1MM homes)
- Construction commenced Q4 2022

Business Model
- Merchant transmission project selected by NYSERDA through a competitive RFP process to transport Canadian renewable energy directly into NYC
- Host municipalities in New York will receive ~$1.4 billion in new tax revenue over the first 25 years of the project, benefiting 73 municipalities and 59 school districts

Regulatory & Community Support
- All major permits received (Article VII, Presidential Permit, Army Corps Permit)
- Widespread support (environmental, union, business, host communities)
- Strong local support as evidenced by 36 municipalities passing resolutions of support for the project

Environmental & Economic Benefits, Energy Resiliency
- Estimated to decrease carbon emissions by ~37 MM metric tons over the first 15 years and reduce harmful local air pollutants by ~20% (1)
- Significant economic benefits in New York – project will utilize organized labor and is estimated to create over 1,400 direct jobs during construction and an additional +3,000 secondary jobs (2)
- Buried infrastructure will make New York’s aging energy grid safer, more resilient, and more reliable in climate change related events
- First conversion of fossil generating site to clean energy site in Astoria, Queens

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(1) Equivalent to removing 44% of passenger vehicles from New York City streets.
(2) Source: PA Consulting.
Buried Transmission vs. Overhead Transmission

CHPE’s buried, resilient design mitigates damage from extreme weather events where overhead transmission lines are more susceptible to damage causing large scale power outages.

Here is how CHPE will help:

- CHPE’s Canadian hydropower source is geographically distinct from NYC and neighboring states and less likely to experience similar weather conditions at the same time as NYC

- Hydropower from the HQ system would be available on demand around-the-clock, providing clean energy to back up other renewables

- CHPE will be buried, safe, and resilient, and will have blackstart capabilities ensuring firming power is available within minutes of any power shortage allowing for lights, air conditioners, and other vital resources to stay powered
The Hertel–New York Interconnection Project

- Located entirely within Canada, originating in La Prairie, Québec and traveling underground/underwater approximately 36 miles (58 km) to the New York-Canadian border
- Will be owned, operated and maintained by Hydro-Québec

The Champlain Hudson Power Express ("CHPE")

- The U.S. portion of the transmission system, traveling underground/underwater ~339 miles (545 km) from the Canadian border to Astoria, Queens
- Will be owned, operated and maintained by CHPE LLC
### Right-of-Way Acquisition / Co-Location Approaches

<table>
<thead>
<tr>
<th>Submarine Route</th>
<th>Terrestrial Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Champlain</td>
<td>Railroad ROW</td>
</tr>
<tr>
<td>~97 miles</td>
<td>~108 miles</td>
</tr>
<tr>
<td>Hudson River</td>
<td>NY State / County / Municipal Roads</td>
</tr>
<tr>
<td>~89.5 miles</td>
<td></td>
</tr>
<tr>
<td>Harlem River</td>
<td>CHPE-Controlled Property</td>
</tr>
<tr>
<td>~6.5 miles</td>
<td>~4 miles</td>
</tr>
<tr>
<td><strong>Total Submarine Route</strong></td>
<td><strong>Total Terrestrial Route</strong></td>
</tr>
<tr>
<td>~193 miles</td>
<td>~146 miles</td>
</tr>
</tbody>
</table>

*Mileage subject to change based on final route design.*
### HVDC Transmission Cables
- High voltage direct current cable (HVDC) technology is a safe, reliable, time-tested technology -- ideal for transporting electricity over long distances with minimal losses.
- Two, five-inch diameter XLPE cables are buried/submerged along the route.
- No environmental exposure/shock/magnetic field issues (cables are solid-state with no insulating fluids).

### VSC Converter Station
- High voltage direct current converter (HVDC) converter technology is a safe, reliable, time-tested technology used worldwide for nearly 70 years.
- Utilizes Voltage Source Converter (VSC) technology to convert power from AC to DC in Quebec and back to AC in Astoria.
- Provides reactive power (voltage support) that stabilizes the electric grid and provides black start capability for New York City’s electric system.

### Installation Overview
- Cables buried ~5 - 8 feet under the ground within conduits with protections installed to prevent damage and inadvertent intrusion.
- Installation closely coordinated with right-of-way owners including, NYSOGS, NYSDOT, municipalities, NYCDOT, and NYC Parks.
- Installation impacts deemed minimal by State and Federal Agencies.

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**Diagram:**
- HVDC Transmission Cables
- VSC Converter Station
- Installation Overview

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**Image:**
- HVDC Transmission Cables
- VSC Converter Station
- Installation Overview

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**Other Details:**
- HVDC Transmission – Proven Technology
- CHPE Champlain Hudson Power Express

New York Independent System Operator (NYISO) Interconnection Process

Multi-step process to interconnect to grid:

- Developer files Queue Position (CHPE: Q#631 and Q#887) with NYISO
- NYISO performs System Reliability Impact Study (SRIS) to determine if project can safely and reliably connect to the grid
- Developer enters project into eligible NYISO Class Year
- NYISO models all Class Year participants together to determine what System Upgrade Facilities (SUF) / Connecting Transmission Owner Attachment Facilities (CTOAF) are required for all projects to safely and reliably connect to the grid
- NYISO determines SUF and CTOAF costs and allocates those costs to each project depending on their grid impacts
- Developer decides whether to accept or reject cost allocations:
  - If developer accepts cost allocations, developer posts security to ensure upgrades will be constructed
  - If developer rejects cost allocations, project is withdrawn from the Class Year
CHPE is the only scale, permitted renewable energy solution that can replace half of Indian Point’s power supply while contributing significantly towards NY State’s renewable goals and creating substantial jobs.

Permits & Authorizations

- NY State Water Quality Certificate
- NY State Article VII Certificate
- U.S. Department of Energy Environmental Impact Statement
- Presidential Permit
- U.S. Army Corps Permit


Substantial outreach, transparency, and partnership building have yielded strong support from stakeholders including towns, environmental groups, elected officials, and labor unions.
The Importance of Stakeholder Engagement in the Private Sector

**Then**

**Wall Street Journal**

Power Lines Drawn

Energy Plan Creates Unusual Alliances

By Joseph De angelo

June 18, 2012 12:17 pm

A proposal to build a power line underneath the Hudson River and Lake Champlain to deliver electricity to New York City has created an unusual alliance: the Sierra Club, a critics in some parts and a proponent of others.

With a 110-mile-long power line that would connect the city to power generation by Canadian wind turbines and hydroelectric plants. The power line opposes the project because, the group says, it would benefit to improve New York's existing power infrastructure. That stands on the same site as another Meadow, the operator of New York energy service, a nuclear power plant the Sierra Club has opposed doing.

"Being on the same side of energy, I think we have different interests as stakeholders," said Brian Wilson, chairwoman of the group's New York City energy committee.

Energy economists like Goddard, the company supporting the Hudson power line because "the state needs another grid to increase reliability. The problem with the project is that it doesn't really do that."

Meanwhile, advocates for a bill to block the Hudson power line in another country would block the New York power line. The advocates include state Sen. George Maziarz, a Buffalo-area Republican. Association of Independent, a Queen Democrat, and others who don't normally speak up on legislation.

**Financial Post**

Americans aren’t just blocking our oil pipelines, now they’re fighting Hydro-Quebec’s clean power lines

Renewable energy powerhouse’s plan to light up U.S. northeast encounters opposition from local groups, fossil fuel rivals

August 3, 2021

A reader wrote in on Aug. 3, 2021.

But just as oil and gas companies have encountered opposition to nearly every new pipeline, Hydro-Quebec is finding resistance in an effort to expand its networks into more export markets, which are all in the U.S. northeast. Indeed, some fossil fuel companies that would be supplied by Hydro-Quebec are fighting to block the construction of its new transmission lines.

"Some projects -- be it a transmission line or a pipeline or a highway or whatever -- there’s always a certain amount of public opposition," said Fernando Campillo, director of strategic affairs and investor relations for Hydro-Quebec, told the Financial Post. "It’s a good thing because it makes the project developer ask the right questions."

**Patch Peeksicortland, NY**

Peaks vs Goliath – Champlain Hudson Power Express: A Bad Idea

From Article by Kirk Minster, published August 13, 2014

The Stony Point hearing attracted about 250 people, the vast majority of whom strongly opposed the project. This included community members whose property would be subject to eminent domain.

The environmental group Scenic Hudson commented that it supported the high voltage transmission line only after CHPE created a $9.5 million settlement fund and agreed to move the route from certain sensitive aquatic areas in the Hudson River. This prompted hearing from the crowd calling for the line to "stay in the river" and chants of "people over fish." However, the Sierra Club Atlantic Chapter responded that the line should never be built altogether citing the destruction of natural areas in Canada to power the line and sacrificing in-state renewable energy solutions.

**Now**

**Tribal, Municipal, Elected Official & Public Support**

- Letter of support from Mohawk Council of Kahnawake in Canada, a project partner
- 38 resolutions of municipal support
- 18 letters of support from elected officials across New York State
- 3000+ letters of support from members of the public who care deeply about the environment and New York’s future

**Organized Labor**

- 8 letters of support from leadership of NYS labor unions including: IBEW, NYS Laborers, Operating Engineers, ELEC & Building and Trades
- 700+ letters from individual members of NYS laborers
- 30+ letters from members of IBEW
- 50+ letters from members of Operating Engineers

**Business & Real Estate Advocacy Organizations**

- Support from NYC real estate organizations: RISNY, Brownfield, ESL, Green, Tishman Speyer, RRR & Vornado
- 11 letters from NYS Chambers of Commerce & the Business Council of New York State
- 13 letters of support from NYS county industrial development agencies

**Academics & Environmental Organizations**

- 16 letters from organizations advancing environmental awareness and support in NYS including: NYS-CC, Citizens Campaign for the Environment, Nature Conservancy, NY Green Council & Climate Reality Project
- 9 letters from academics at, and representatives from, prestigious New York higher-education institutions such as, Columbia, NYU Law & SUNY Plattsburgh

**3000+ statements of support**

**750+ expressions of support from organized labor**

**25+ letters of support from businesses and real estate**

**25 letters of support from advocacy organizations and higher education**

Letters of Support received from leadership of NYS labor unions including: Laborers, IBEW, NYS, Operating Engineers, ELEC & Building and Construction Trades Council.
Project Benefits – Summary

- One of the largest private investments in NY State history, $3.5 Billion in direct NY expenditures*
- $1.4 Billion in new Property Taxes for over 150 communities*
- 1,400 new organized labor construction jobs for New Yorkers with strong Labor Support
- $40 Million Green Economy Fund and $117 Million Enhancement, Restoration, and Research/Habitat Improvement Trust Fund

* Over first 25-year period.
Appendix – Project Progress Photos
Today New York took a huge step towards meeting our nation-leading clean energy goals!

The @CHPExpress transmission line is a transformative project that will power more than one million homes, create nearly 1,400 green jobs, & help build a healthier future for all New Yorkers.
CHPE Terrestrial Cable Reels – Manufactured in North Carolina and Sweden
Initial CHPE Land Cable Loadout in Karlskrona, Sweden
Initial CHPE Submarine Cable Delivery at the Port of Albany, NY
Terrestrial Construction Activity – HDD and Trenching
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