IAEE INTERNATIONAL ASSOCIATION for ENERGY ECONOMICS

Chair in Energy Sector Management
HEC MONTRÉAL

Northeast Decarbonization and Regional Electricity Sector Integration

Pierre-Olivier Pineau, HEC Montréal

Monday, May 11, 2020 – 10 am to 11 am

IAEE Webinar

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The Transition Accelerator | L'Accélérateur de transition

NORTHEAST DECARBONIZATION

OPPORTUNITIES AND CHALLENGES OF REGIONAL ELECTRICITY SECTOR INTEGRATION FOR HIGH RENEWABLE PENETRATION

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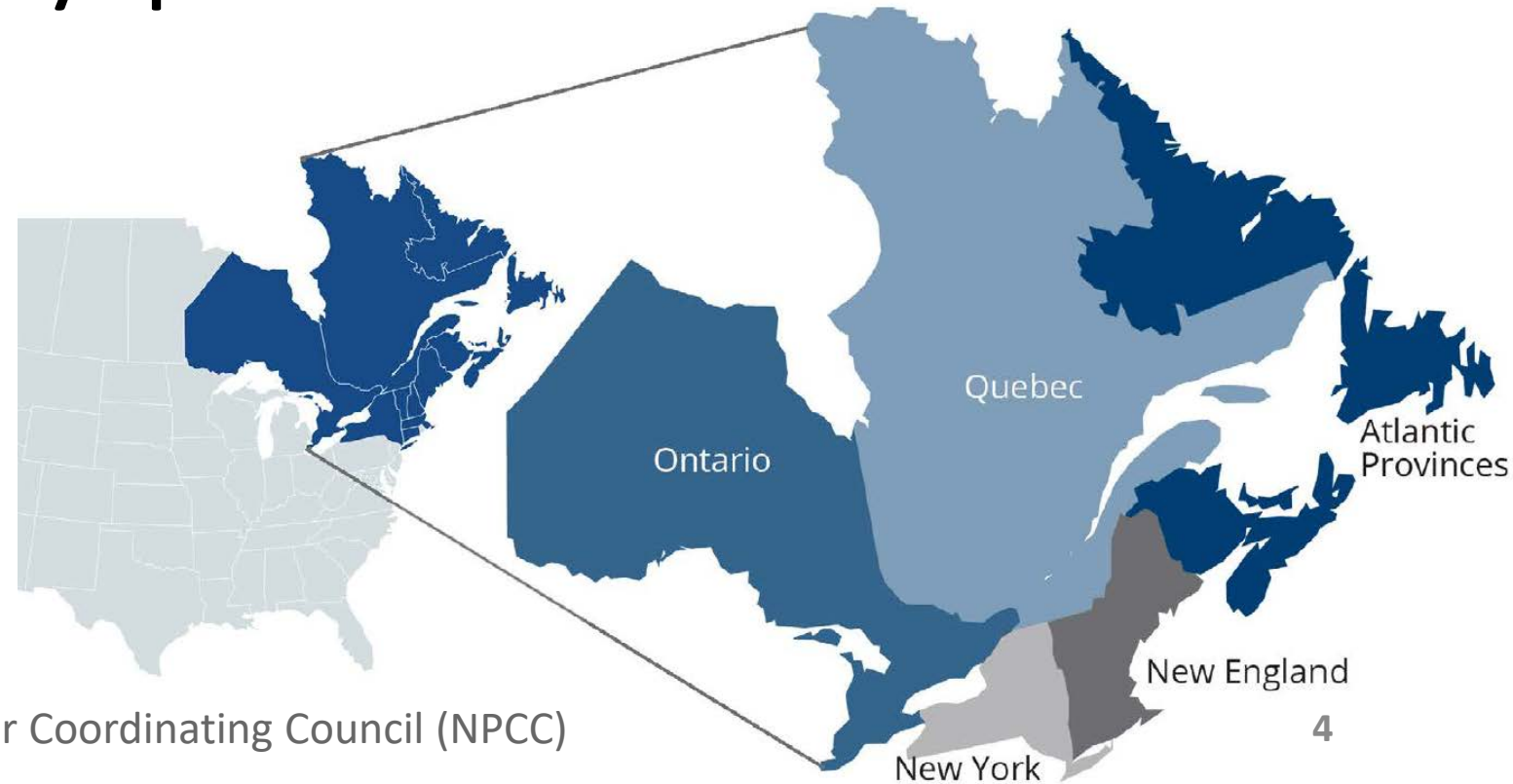
Pierre-Olivier Pineau, HEC Montréal
Simon Langlois-Bertrand, Concordia University

Northeast Electrification and Decarbonization Alliance (NEDA)
Promotes collaboration among jurisdictions in the North American Northeast to achieve deep reductions in greenhouse gas (GHG) emissions through almost 100% renewable energy systems.

Webinar Outline

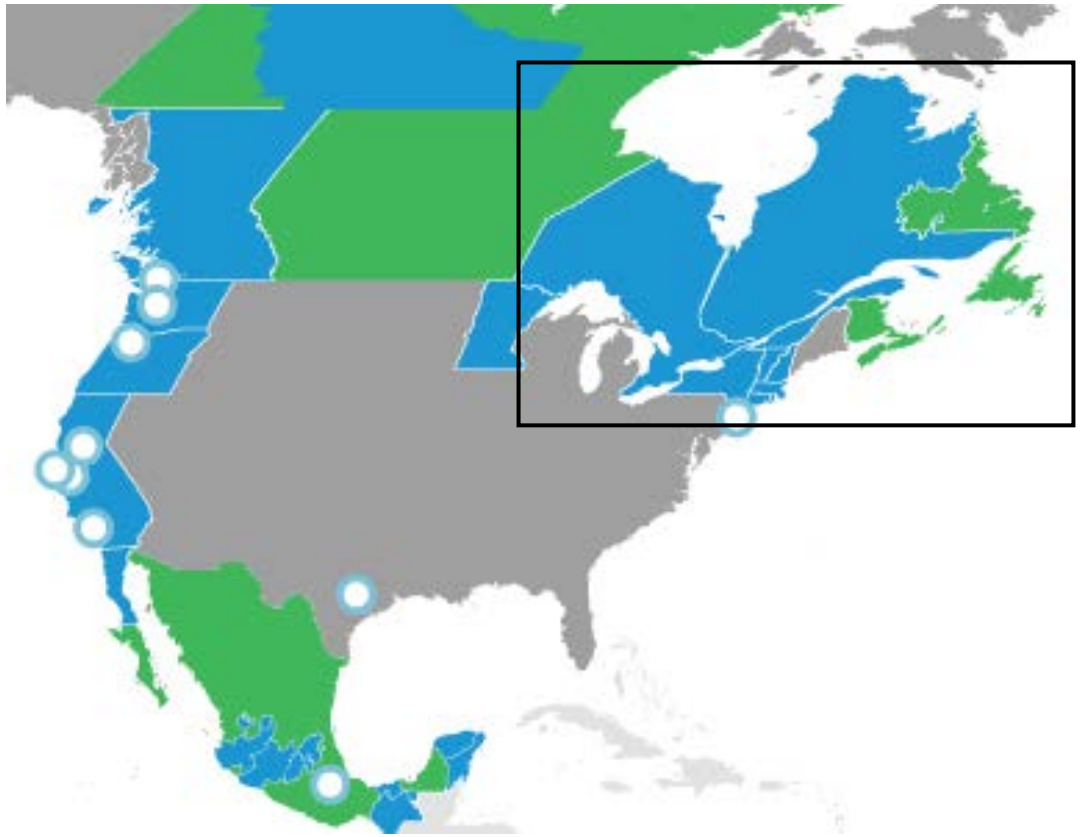
1. Introduction: Climate targets and electricity policies
2. Benefits from greater coordination and collaboration in renewable energy deployment
3. Barriers to greater regional cooperation

1. Introduction: Climate targets and electricity policies



Northeast Power Coordinating Council (NPCC)

Under 2° Coalition: 80-95% GHG reduction below 1990 level by 2050 + real policies

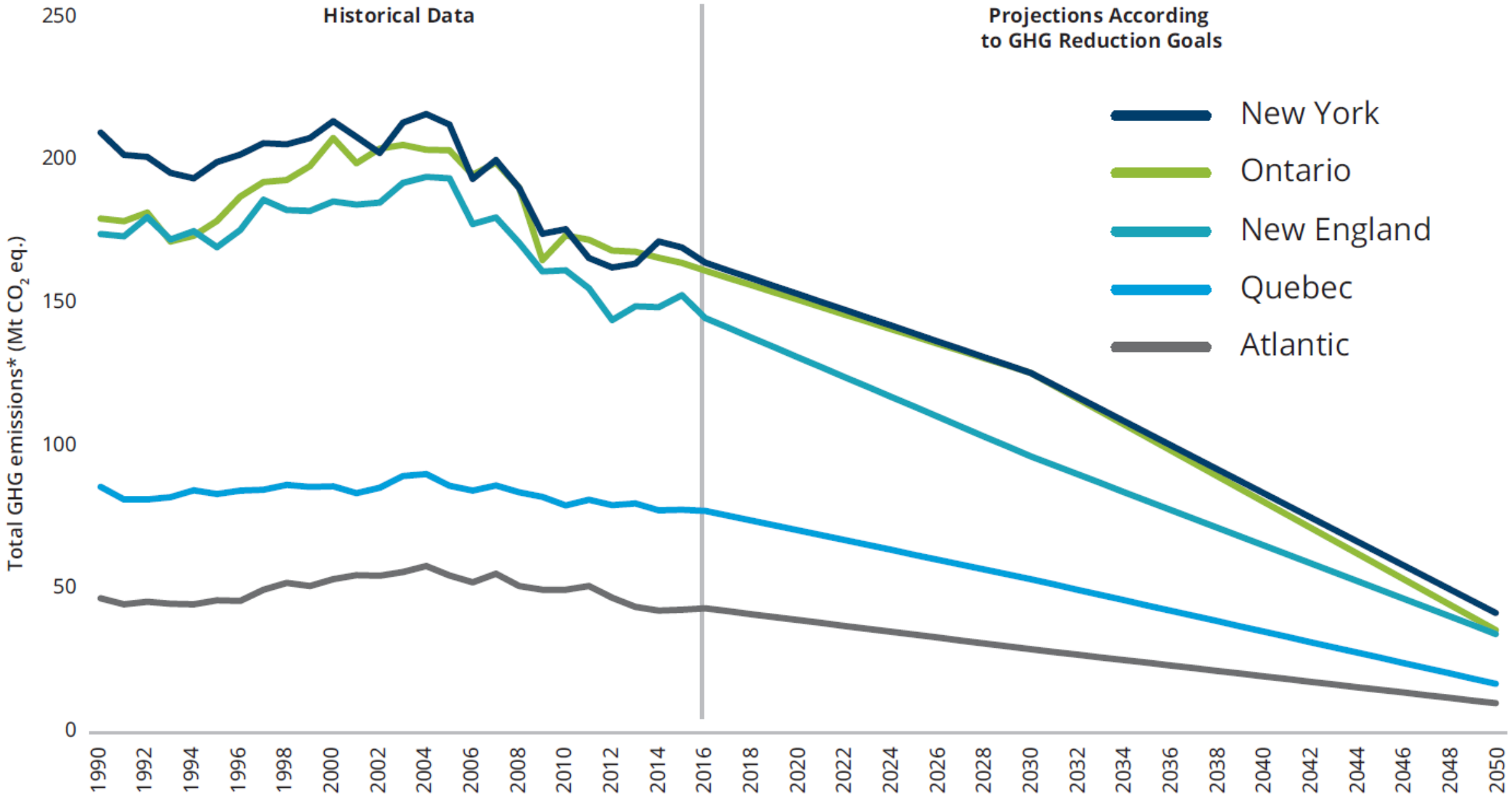


Real policies in the Northeast:

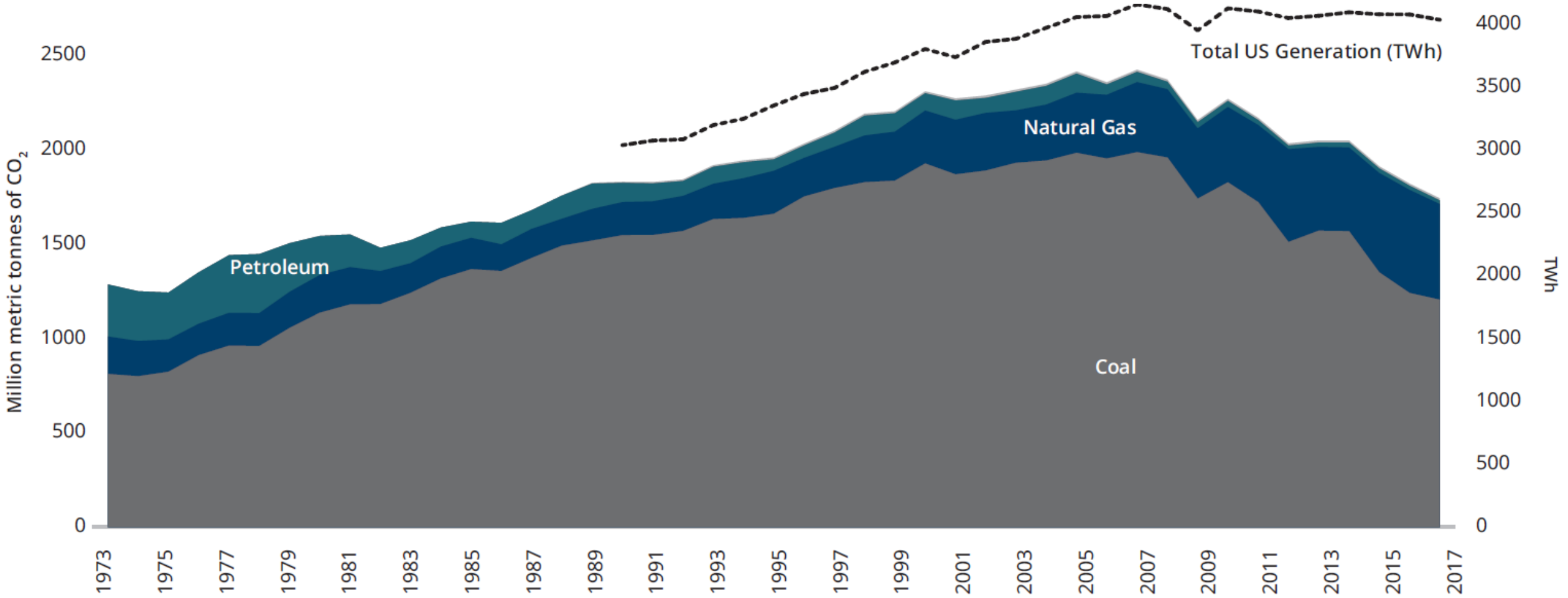
- Renewable Portfolio Standards (RPS)
- Cap-and-trade: RGGI + WCI
- Clean energy funds
- New York's Reforming the Energy Vision (REV)
- Massachusetts Clean Energy RFP
- …

Under2mou (2017)

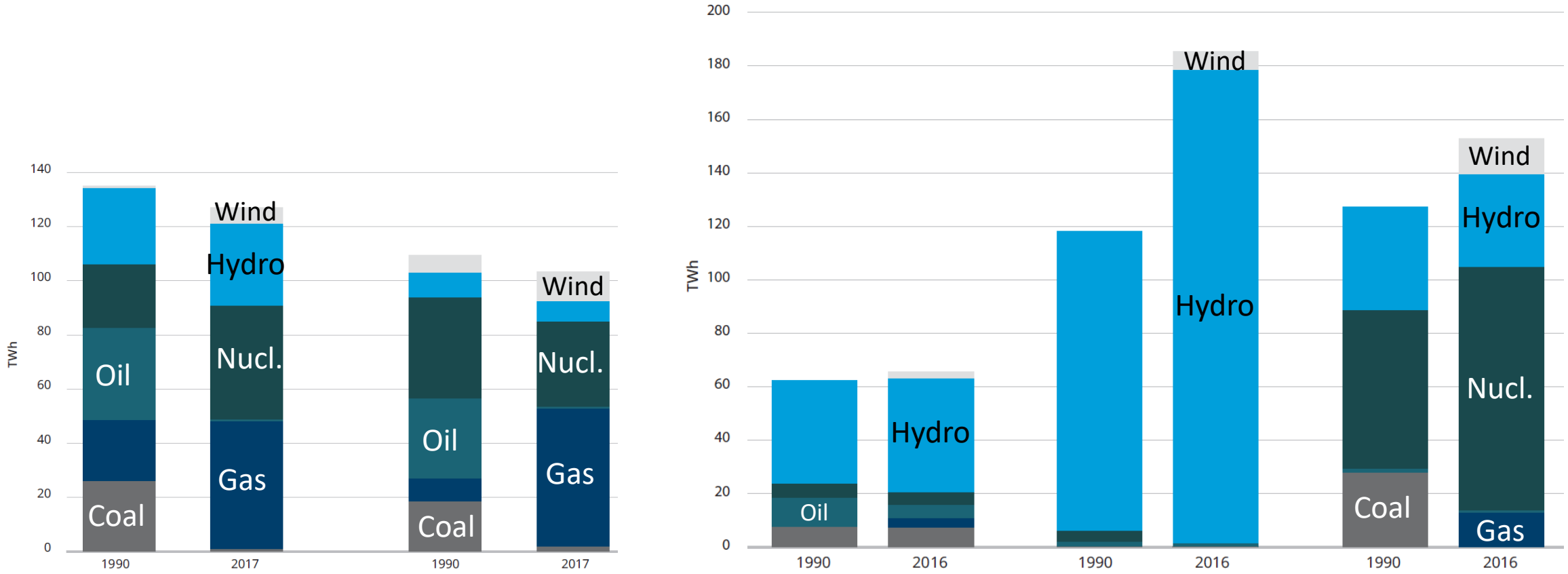
GHG Emissions 1990-2016 with 2050 Goals



U.S. Electricity Sector CO_2 Emissions and U.S. Total Generation, 1973-2017



Power Generation by Source 1990 and 2017 (or 2016)



New York **New England** **Atlantic Canada** **Quebec** **Ontario**

2019 pop.: **20M** **15M** **2M** **8M** **14M**

Generation and consumption, 2017

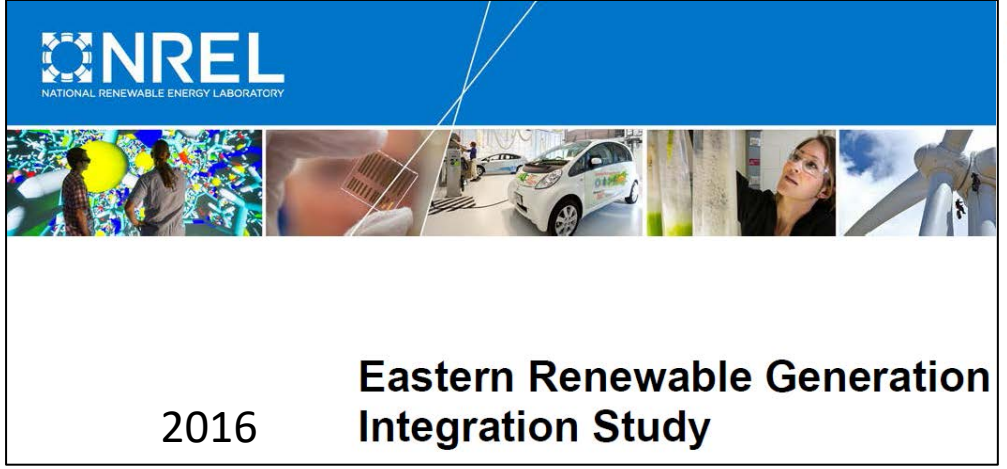
Area	Aggregate		Per capita	
	Generation [TWh]	Consump. [TWh]	Generation [MWh]	Consump. [MWh]
New York	128.07	144.99	6.55	7.42
New England	105.23	115.46	7.08	7.77
Quebec	212.09	173.72	25.38	20.79
Ontario	150.96	133.72	10.60	9.39
Atlantic	63.08	35.91	26.25	14.94

2. Benefits from greater coordination and collaboration in renewable energy deployment

Generic Benefits of Electricity Market Integration

1. Improving reliability and pooling reserves
2. Reduced investment in generating capacity
3. Improving load factors and increasing demand diversity
4. Economies of scale in new construction
5. Diversity of generation mix and supply security
6. Economic exchange
7. Environmental dispatch and new plant siting
8. Better coordination of maintenance schedules

CEC (2002), UN (2006) and ESMAP (2010)



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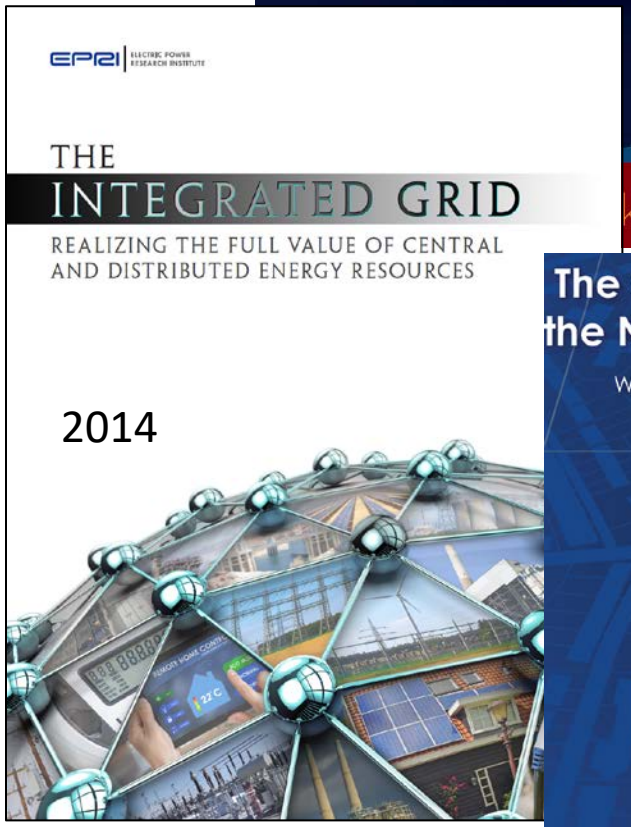
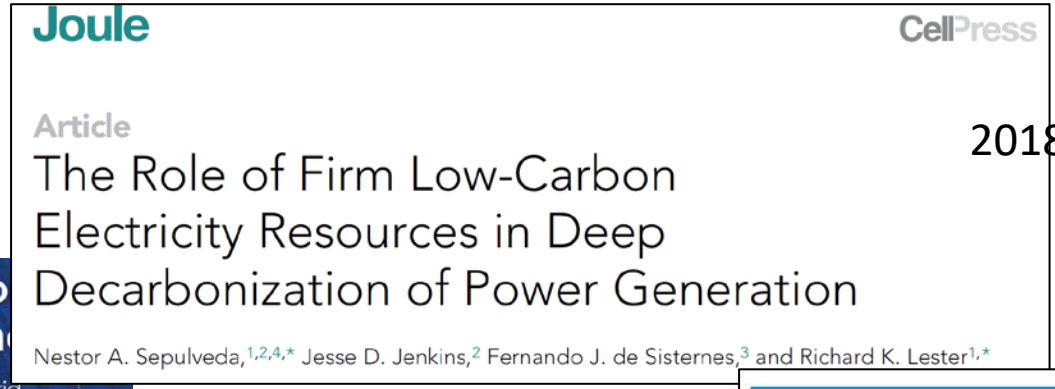
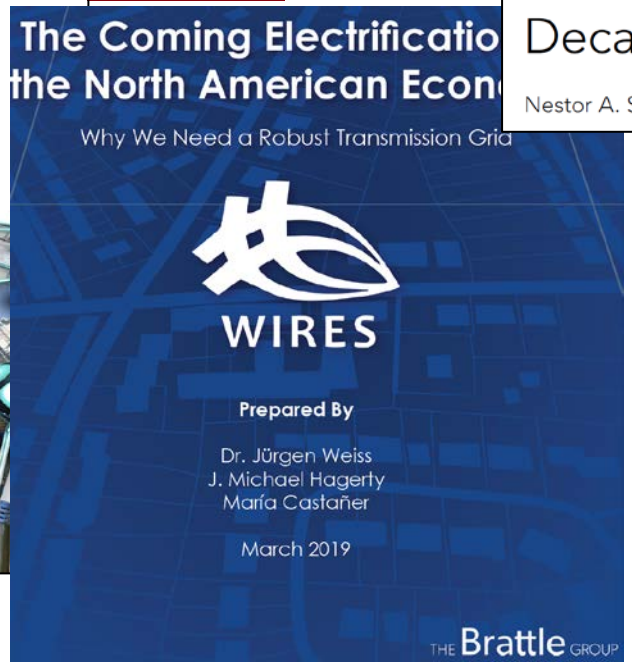
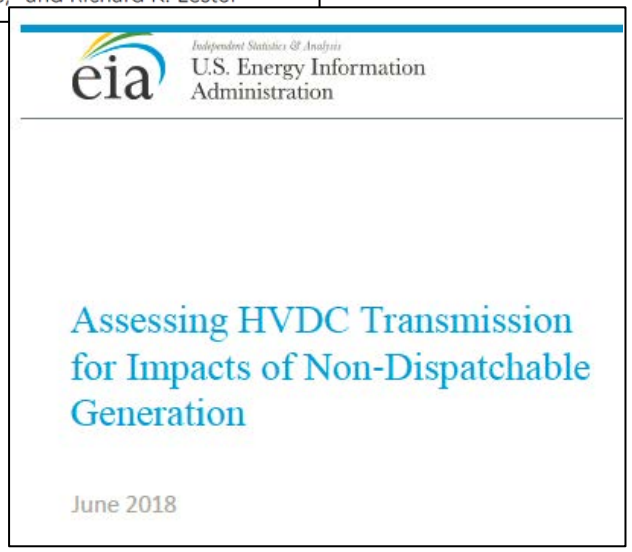
2020(?): North American Renewable Integration Study





2018





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journal homepage: www.elsevier.com/locate/enpol

The cost of decarbonizing the Canadian electricity system

Brett Dolter[a,*], Nicholas Rivers[b]

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[b] Public and International Affairs, Institute of the Environment, University of Ottawa, Canada

Deep Decarbonization in the Northeastern United States and Expanded Coordination with Hydro-Québec

April 2018

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Working Paper Series

Two-Way Trade in Green Electrons: Deep Decarbonization of the Northeastern U.S. and the Role of Canadian Hydropower

EMIL DIMANCHEV, JOSHUA HODGE, AND JOHN PARSONS

FEBRUARY 2020 CEEPR WP 2020-003

Forthcoming

Deep Decarbonization in Northeastern North America: The Value of Electricity Market Integration and Hydropower

Jesús A. Rodríguez, Sébastien Debia, Pierre-Olivier Pineau

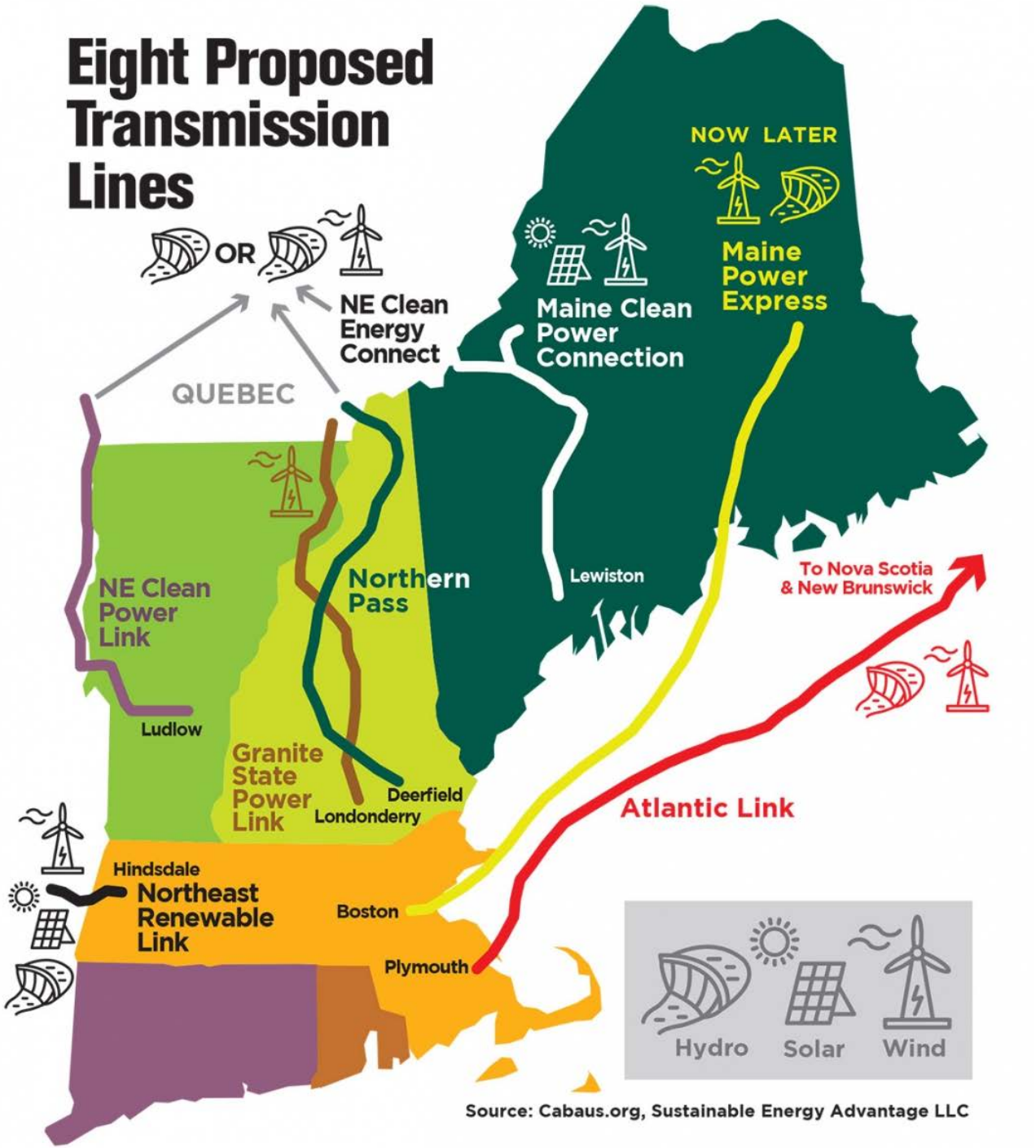
May 9, 2020

Political recognition of the need to cooperate

"System planners and operators should strengthen and diversify the generation resource mix and storage capabilities to reduce energy cost pressures"

Conference of New England Governors and Eastern Canadian Premiers (2018)

"New England Governors' Commitment to Regional Cooperation on Energy Issues" (2019) → New England States Committee on Electricity (NESCOE)



Transmission Crisis

Massachusetts Clean Energy RFP

20-yr contract 9.45 TWh/yr
Awared to Hydro-Quebec in 2018
(pending transmission)

3. Barriers to greater regional cooperation

Institutional and organizational barriers

- Federal governement versus States / Provinces
- Regulatory agencies & System Operators have no mandate to collaborate or plan beyond their borders
- Mix of competitive and regulated markets across the region

Political Barriers: Regional cooperation conflicting with industrial policy

- Renewable energy for local economic development and for (local) green jobs
- New York Power Authority's *ReCharge NY* program: guaranteed access to hydropower at below-market prices for some businesses
- Hydro-Quebec's "Special Contracts": 54 TWh at less than 4¢/kWh

Social Acceptance Barriers

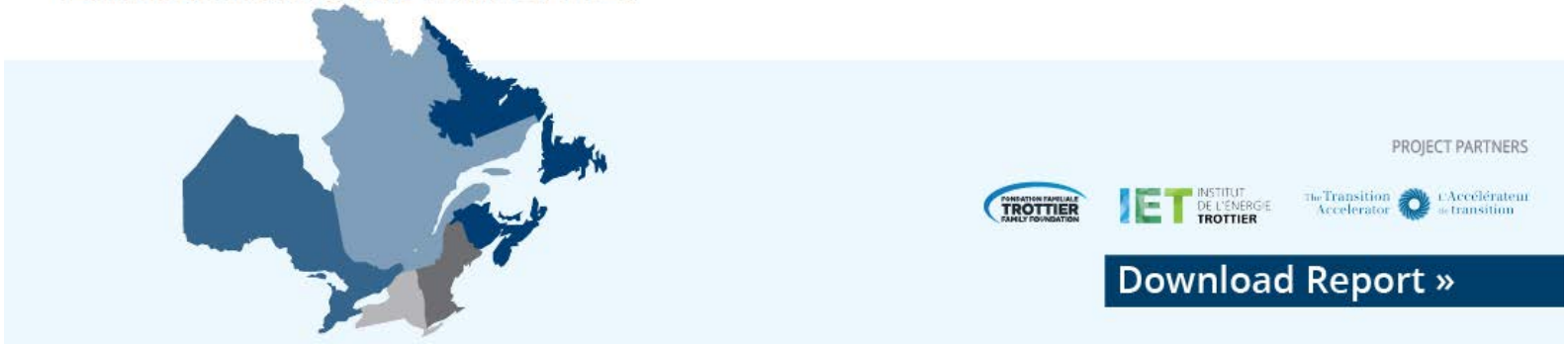
- Local opposition from populations concerned by
  - Economic impacts
  - Environmental impacts
  - Social impacts
  - Visual impacts
  - …
- *New England Clean Energy Connect* project opposed by:
  - Environmental groups (Natural Resources Council of Maine + Sierra Club)
  - Local renewable energy producer associations (Maine Renewable Energy Association, ReEnergy Biomass Operation)
  - Incumbent companies: New England Power Generators Association (NEPGA)

How to move forward?

- Give special attention to regulatory and market discrepancies across jurisdictions
- Decouple industrial policy (and job creation) from renewables investment
- Establish a legitimate process for addressing citizens' concerns over transmission line projects

Conclusion

- Decarbonization will require strong power systems
- The current patchwork of power systems is recognized to be incompatible with the future needs
- A regional dialogue has to be started to set up some joint electricity institutions, on a truly collaborative mode.



Thank You

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