North American Electricity Policy and Planning Harmonization: Background Papers Presentations

Alan Krupnick, Dan Shawhan, Phil Gass, Juan Carlos Belausteguigotia, David Solan and Patrick Schaefer

RESOURCES FOR THE FUTURE

Electric Power in the US and Canada: Opportunities for Transboundary Regulatory and Planning Harmonization
Boise State University, October 20, 2015

Background

- Huge technological, economic and policy changes in North American energy sectors are driving calls for more market and policy harmonization.
- DOE's Quadrennial Energy Report notes the need for examining challenges and opportunities to North American energy policy and market integration
- RFF and its partners at IISD and ITAM have an initiative on the same topic
- Hence, we are putting on this DOE-sponsored workshop and another covering US-Mexico harmonization (10/27)
- Summary will be written and delivered to DOE to use in the next QER on electricity

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Draft Background Papers

- Meant for participants only for now
- Four papers, two providing issues for the workshop discussions (*)
  - Key Harmonization Concepts
  - Environmental Policy Harmonization*
  - Operation and Planning Harmonization*
  - Data Sharing and Modeling

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Key Concepts

- Meaning of Harmonization
  - Ranges from notification and information sharing, through coordination, through aligning regulatory processes and regulations to full integration (as in a common market)
- Economic Benefits of Harmonization
  - Free trade
  - Efficient activity location
  - Lower transactions cost
  - Dynamic efficiency
  - Internalizing externalities
  - Policy demonstration

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Key Concepts, cont.

- Instruments of Harmonization
  - Not specific to electricity sector
  - Specific
    - Bilateral and trilateral (Regulatory Cooperation Councils)
    - MOUs to cooperative institutions to treaties
- Scope for the workshops
  - Regulatory lifecycle (e.g., benefit-cost analysis; enforcement))
  - Sectors: this workshop restricted to electricity
  - Geography: states and provinces; Not Caribbean

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- Another set of workshops to be planned

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Three Discussion Sessions Today

9:30–10:45 a.m.	**Session 1: Greater Harmonization of System Operation, Reliability, and Transmission Pricing**
9:30–10:00	Making power flows more economically efficient
10:00–10:30	Reliability coordination: Opportunities for improvement
10:30–10:45	Reducing electricity trade duties and uneconomic transmission charges
11:00–12:30 p.m.	**Session 2: Greater Harmonization of Planning, Siting, and Approval Processes**
11:00–11:30	Coordinating planning
11:30–11:45	Allocating cost recovery to rates on both sides of a border, when the benefits cross the border
11:45–12:15	Improving siting and approval/permitting processes for proposed new cross-border infrastructure
12:15–12:30	Workforce development opportunities
1:30–4:15 p.m.	**Session 3: Opportunities for Environmental Regulatory Harmonization (Conventional Air Pollutants, Renewables and Climate Policy)**
1:30–2:15	Conventional Air Pollutants
2:15–3:15	Renewables Policies
3:15–3:30	Break
3:30–4:15	Climate Policies

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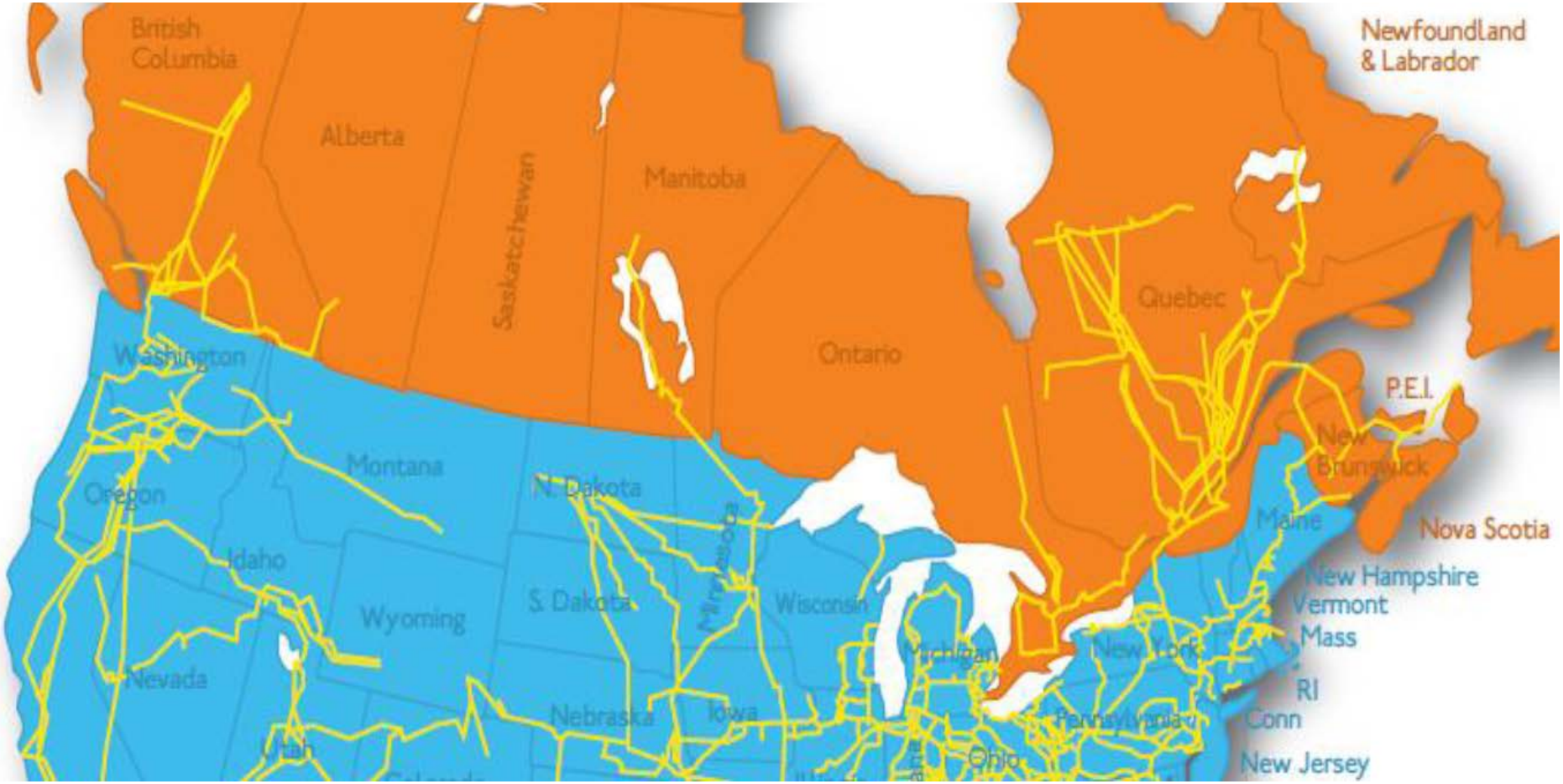
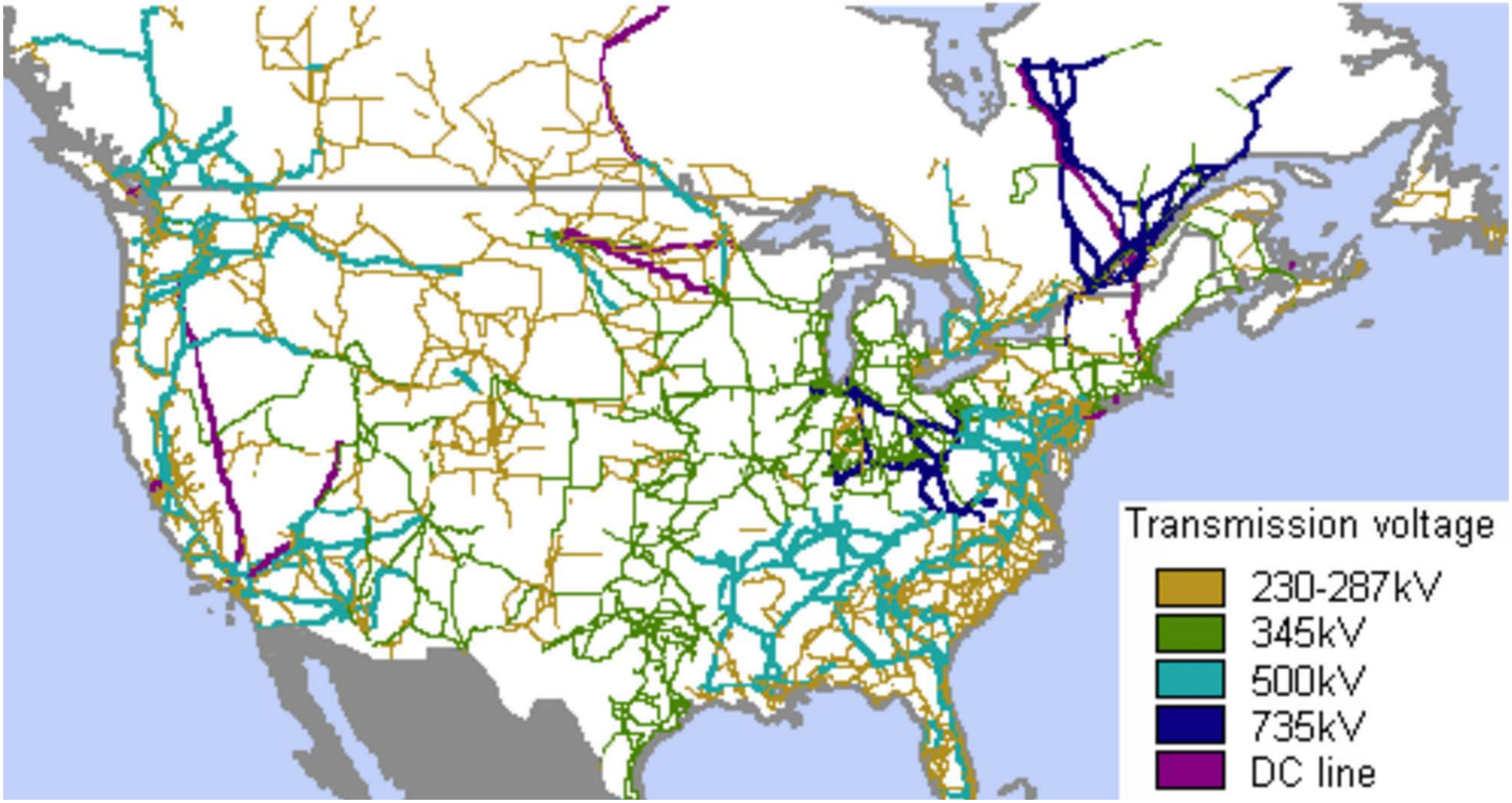
US & Canadian Transmission Lines ≥ 345 kV



Map copyright Canadian Electricity Association. Lines shown are 345 kilovolts ("kV") and above. There are numerous interconnections between Canada and the U.S. under 345 kV that do not appear on this map.

High-Voltage Transmission Lines



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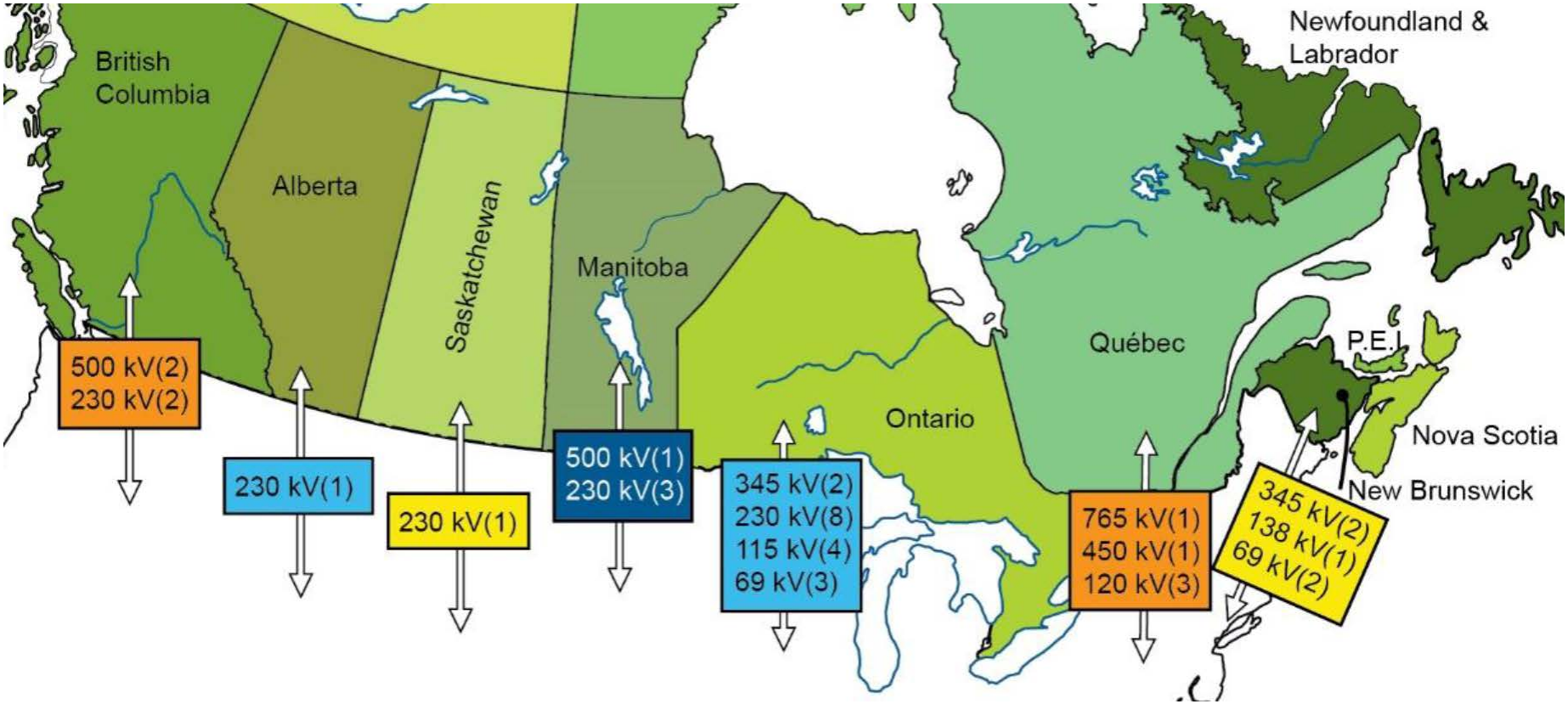
Canada-US Transmission Ties, by Province



Copyright Canadian Electricity Association. Data from National Energy Board.

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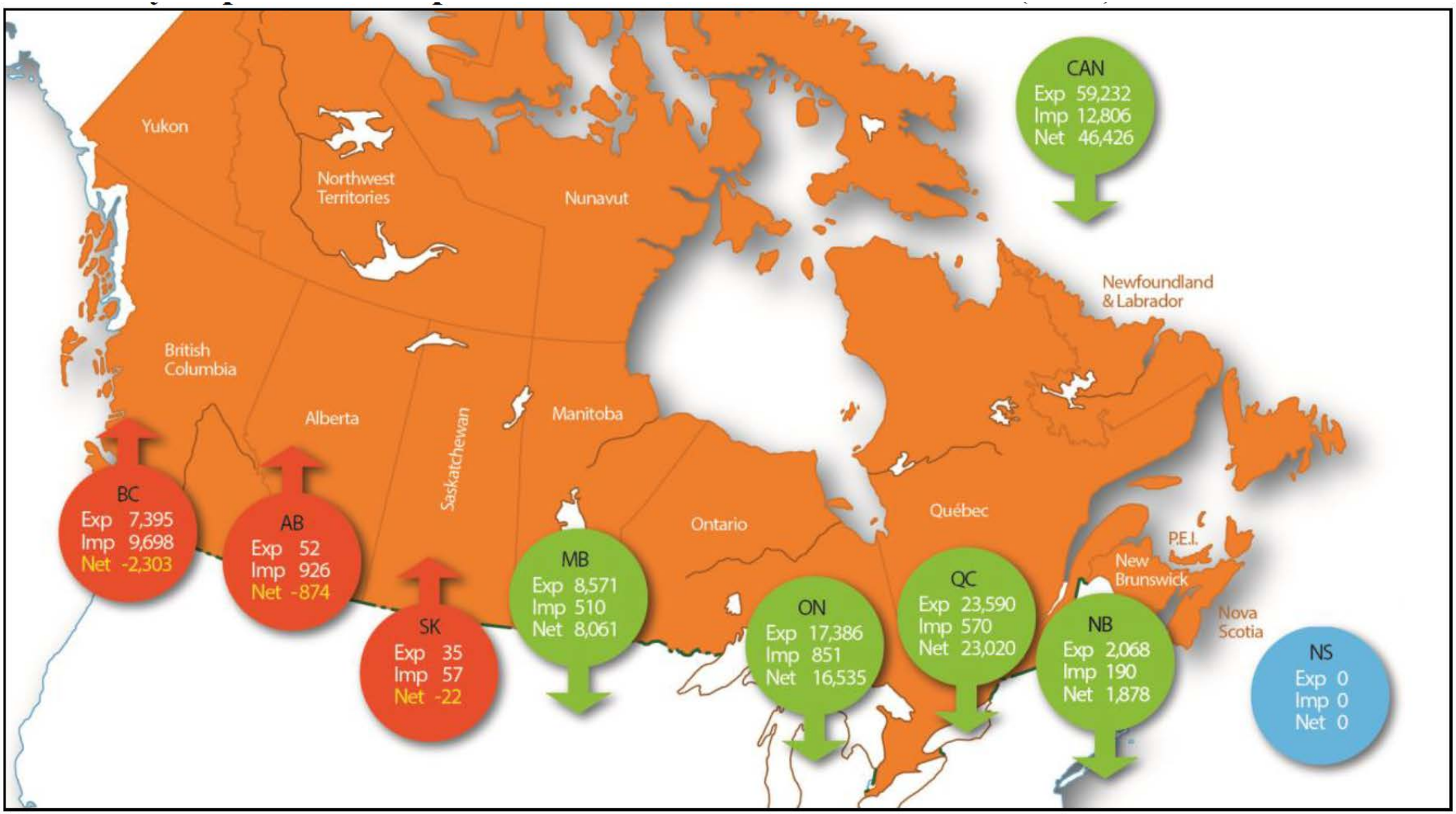
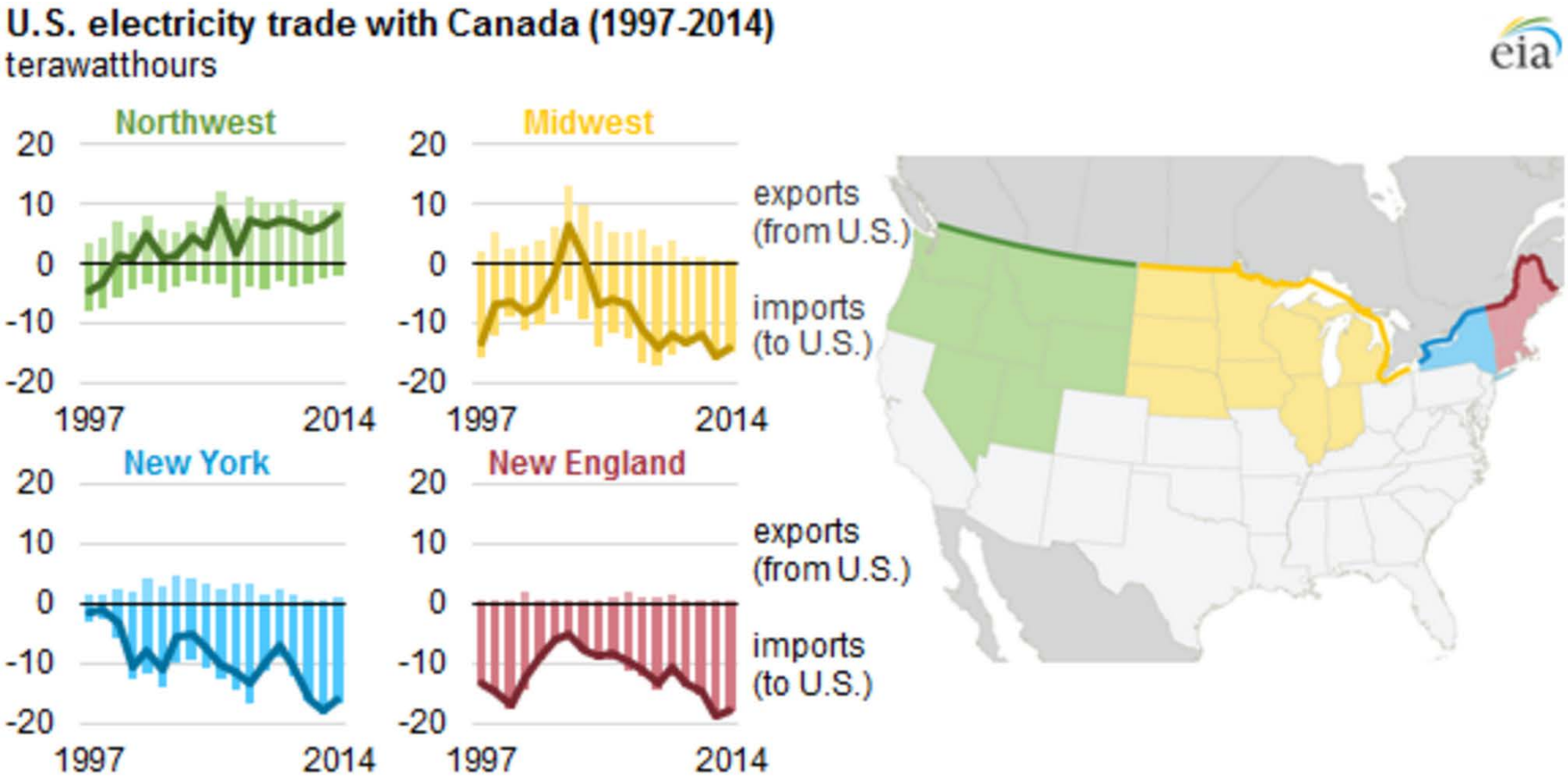
Canada-US Electricity Trade by Province, 2014



Map copyright Canadian Electricity Association. Data displayed are in gigawatt-hours. Numbers may not sum due to rounding. Source: National Energy Board, Electricity Exports and Imports, 2014.

US Net Electricity Exports to Canada, by Region



Source: U.S. Energy Information Administration, based on National Energy Board of Canada
Note: A small amount of electricity is traded by states outside the regions shown.

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Greater Harmonization of System Operation, Reliability, and Transmission Pricing

9:30–10:45 am

Discussion framers: Daniel Shawhan and David Solan

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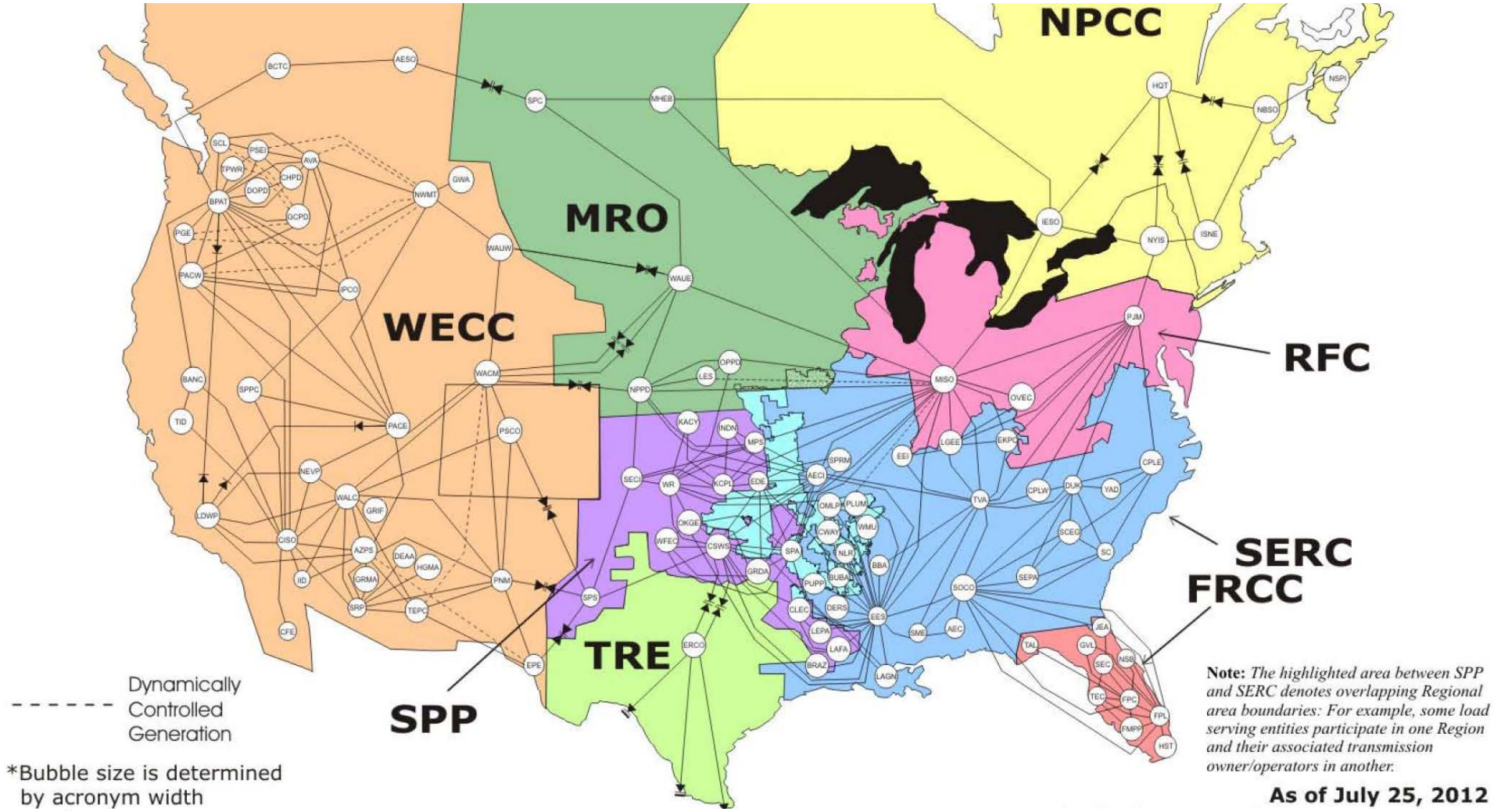
US & Canadian Control Areas



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Day Ahead Market Zonal LBMP

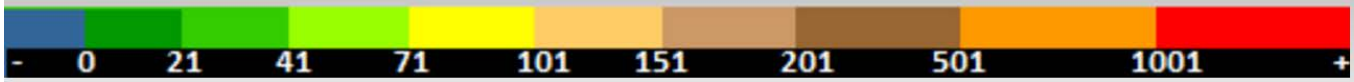
10/19/2015 13:25 ET

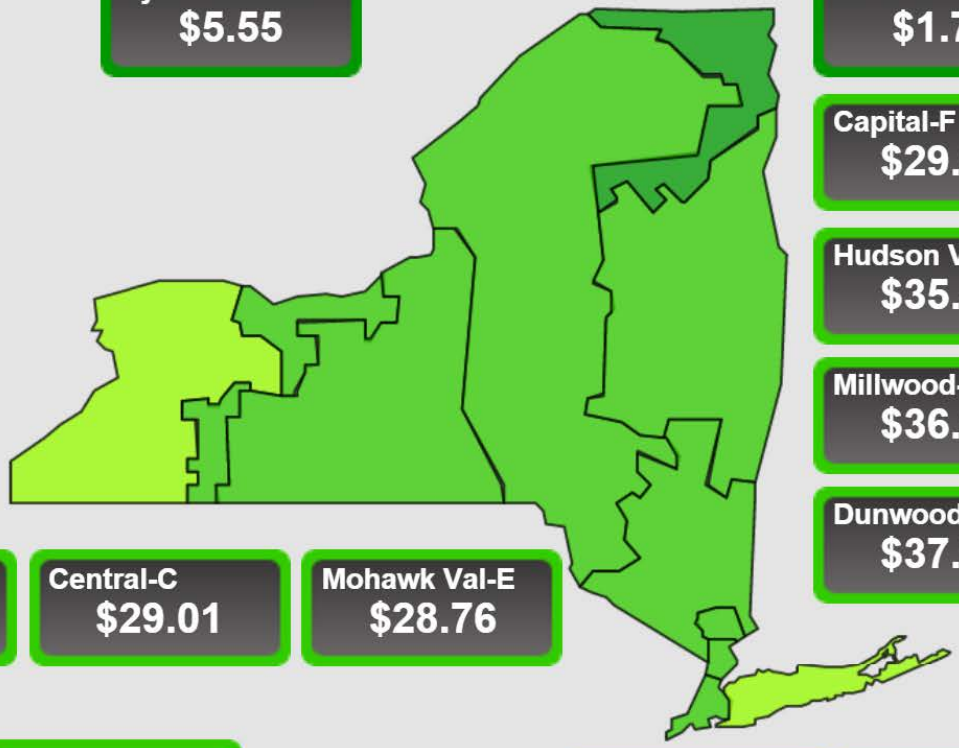
Auto Refresh (Updates with latest data every 5 mins): On

Click on zone box for graph.

Marginal Cost of Energ

$28.1





Hydro-Quebec $5.55

North-D $1.70

Capital-F $29.97

Hudson Val-G $35.45

ISO-NE $57.38

IESO $23.77

Millwood-H $36.88

Dunwoodie-I $37.09

West-A $42.00

Genesee-B $28.24

Central-C $29.01

Mohawk Val-E $28.76

PJM $35.04

NYC-J $37.26

Long Island-K $44.75

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9:30–10: Economically efficient flows

Background: Economically efficient flows are the flows that result from obtaining power and ancillary services from where they are least expensive

1. To minimize costs, power and ancillary services should be obtained from where they can be obtained least expensively, up to the physical and reliability limits of the system.
2. An implication is that power should flow from where marginal prices are lower to where they are higher.
3. Flows from higher-price areas to lower-price areas indicate that more is being spent than necessary.

Question: **Where and how can the timing and amounts of cross-border flows be made more economically efficient?**

1. What and where are the greatest inefficiencies?
2. What would you say are the most promising opportunities for improvements?

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10–10:30: Reliability

10–10:30: Reliability

Background: Canadian and U.S. control area operators participate jointly in North American Electric Reliability Corporation (NERC).

Question: **What improvements in reliability coordination can be made across the borders?**

10:30–10:45: Transmission charges

Background: Cost minimization involves setting transmission charges based on congestion and losses, but extra per-MWh transmission charges are imposed between some control areas.

Questions:

a. Where are there extra per-MWh transmission charges that affect Canada-US electricity flows?
b. Are any of those extra charges justified because of greater environmental damage from generation in the zone whose exports are being disincentivized?
c. **How can the rest of the extra per-MWh transmission charges be eliminated?**

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Greater Harmonization of Planning, Siting, and Approval Processes

11:00–12:30

Discussion framers: Daniel Shawhan and David Solan

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Current U.S.-Canada International Power Line Projects

Name	Sponsor	State-Province	Length (miles)	Voltage & Capacity	Purpose	In-service Date	U.S. Presidential Permit Status
Champlain Hudson Power Express	Transmission Developers Inc.	New York-Québec (QC)	333	1,000 MW, HVDC (underwater, underground, merchant)	Deliver hydro and wind energy from QC to New York City area	Fall 2017 (expected)	Issued October 2014
Great Northern Transmission Line	Minnesota Power (MP)	Minnesota-Manitoba (MB)	220	500 kV, 750 MW, AC	Part of MP-MB Hydro PPA; supports building wind in North Dakota	June 2020 (expected)	Application filed April 2014
Lake Erie Connector	ITC	Pennsylvania-Ontario (ON)	73	1,000 MW, HVDC (underwater, merchant)	Enable bidirectional flow of energy and capacity; enhance security and reliability	2019 (expected)	Application filed May 2015
New England Clean Power Link	TDI-New England	Vermont (VT)-QC	154	1,000 MW, HVDC (underwater, underground, merchant)	Deliver renewable energy from QC into VT and New England	2019 (expected)	Application filed May 2014
Northern Pass	Northern Pass Transmission LLC	New Hampshire (NH)-QC	187	1,200 MW, HVDC line with 345 kV AC spur	Deliver QC hydro into NH and New England	2017 (expected)	Application filed October 2010; re-filed with new route July 2013

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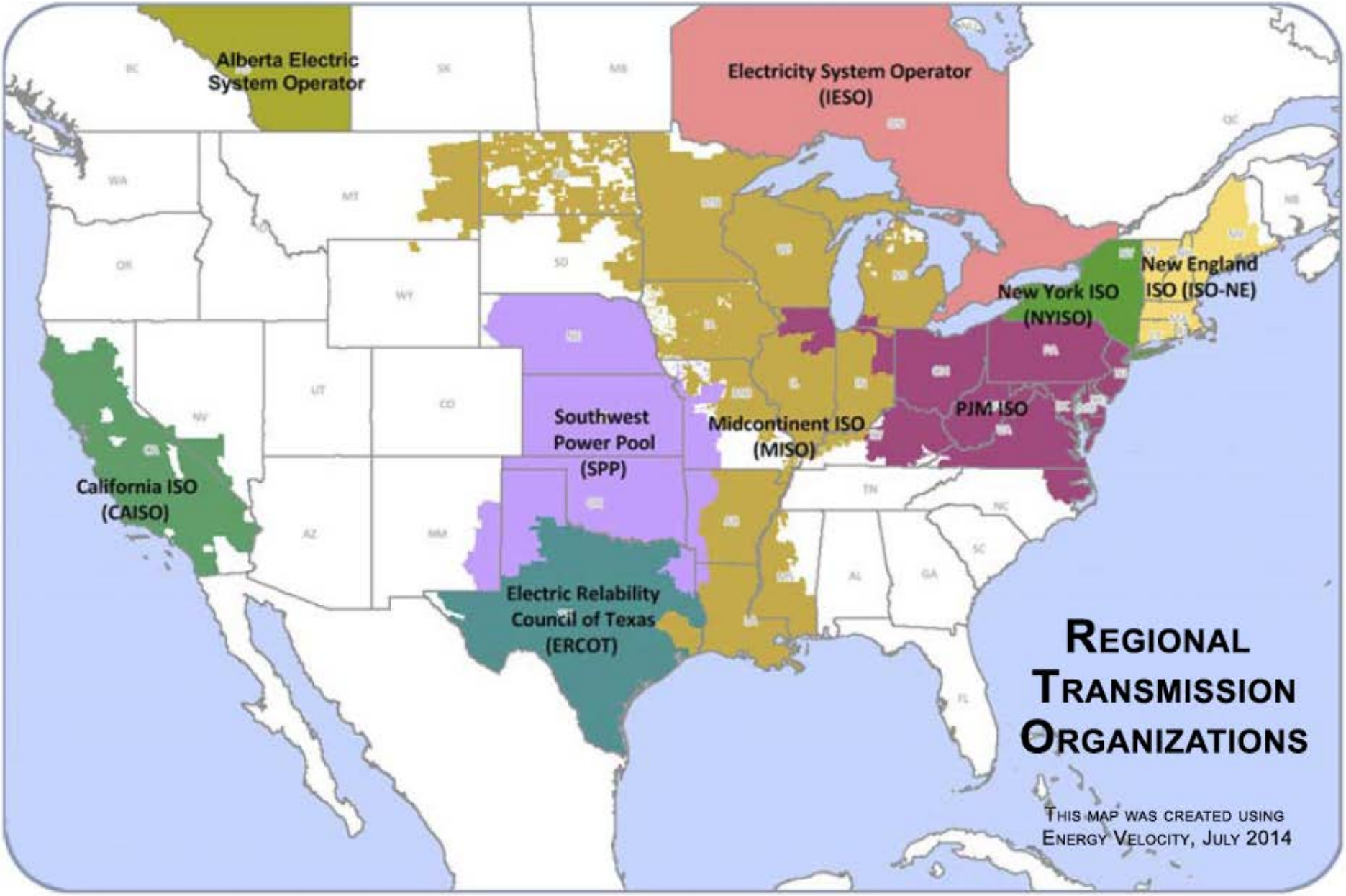
From http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/international-electricity-regulatio-2 *and* http://www.itclakeerieconnector.com/ *as reported by Canadian Electricity Association.*


Alberta Electric System Operator
Electricity System Operator (IESO)
New England ISO (ISO-NE)
New York ISO (NYISO)
PJM ISO
Midcontinent ISO (MISO)
Southwest Power Pool (SPP)
California ISO (CAISO)
Electric Relability Council of Texas (ERCOT)
REGIONAL TRANSMISSION ORGANIZATIONS
THIS MAP WAS CREATED USING ENERGY VELOCITY, JULY 2014

11–11:30: Coordinated Planning of Transmission Expansion

Background:

- Coordination of decision-making about new new transmission lines, can make better options viable and can reduce time to approval. Here, “better” means higher combined expected net benefits for the two countries.
- Eastern Interconnection Planning Collaborative in the East and Western Energy Coordinating Council in the West are both jointly Canadian & U.S.

Question: **How can the U.S.-Canada coordinated planning in the East and in the West be further improved?**

a. Should there be any new institutions, or any changes to existing institutions, to facilitate coordination of planning?

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11:30–11:45: Infrastructure Cost Sharing

Background:

- The cost of a new transmission investment is often recovered partly through regulated charges on customer bills.
- Sometimes, a project is mostly in country A but many of those who benefit are in country B. Inability to allocate some of the cost to those in country B, or the inability to agree on how much of the cost should be recovered via their bills, can delay or prevent a project from being built.

Questions:

a. **For infrastructure investments with significant binational benefits, how can the ability to allocate costs in proportion to the anticipated benefits be improved?**
b. **How can the risk of unresolvable disagreements about cost sharing be reduced?**

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11:45–12:15: Siting and Permitting

Background:

- Siting refers to route selection.
- Permitting refers to approval by governments.
- Approvals can be required by federal, state/provincial, and local governments.
- Environmental Impact Assessments play a role, and the associated practices differ between the US and Canada.
- US and Canada are working at the national levels to improve processes
  - Side-by-side of federal/national approvals and processes
  - Working groups etc.

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Typical Flow for Approvals of Permits & Siting

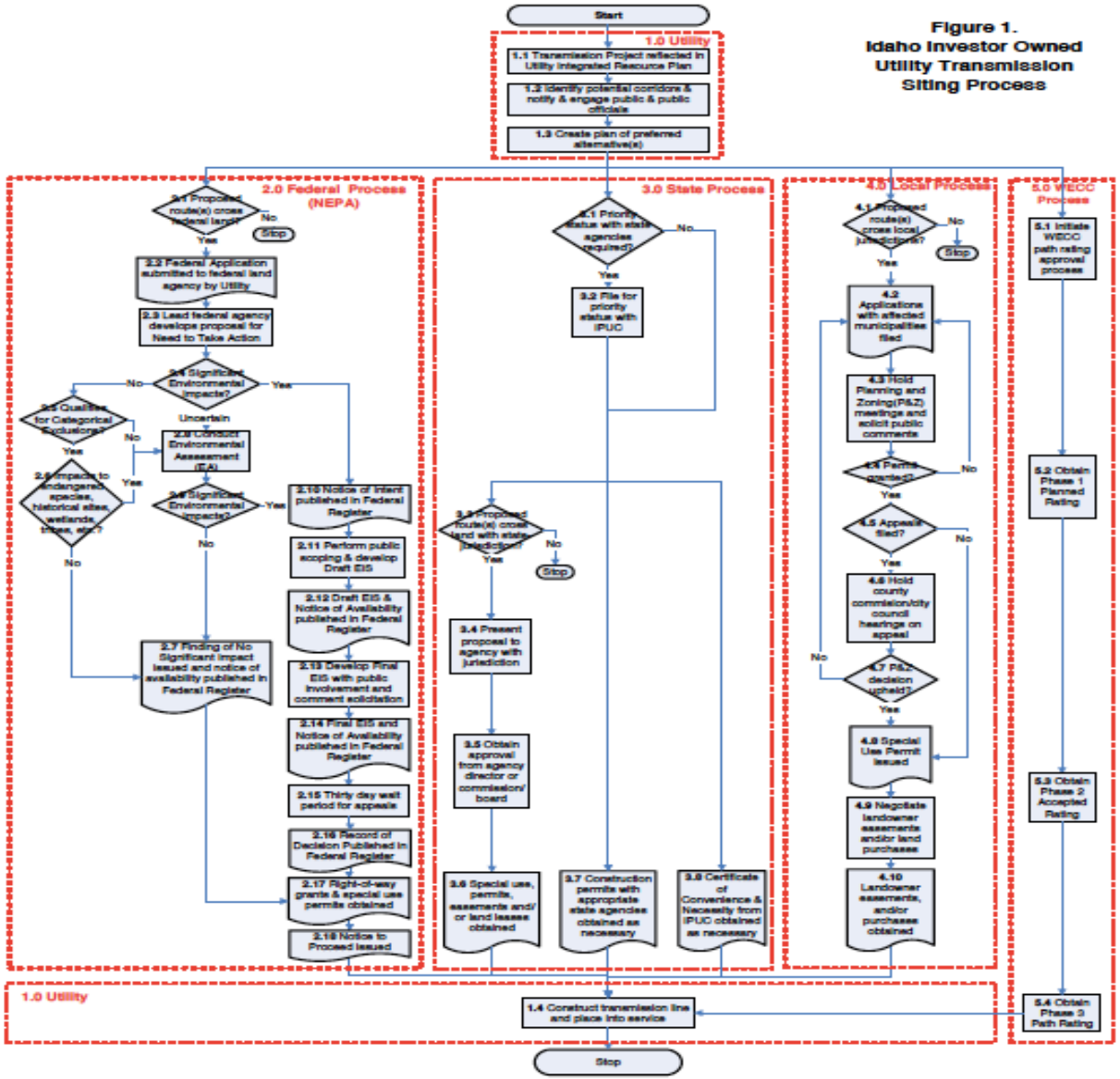

Figure 1.
Idaho Investor Owned Utility Transmission Siting Process

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11:45–12:15: Siting and Permitting

Questions:

a. Which aspects of the countries' siting and permitting processes have the most room for improvement and alignment?

b. What means of improvement hold the most promise?

12:15–12:30: Workforce Development

Background: There is a shortage of suitably skilled workers for many of the current and anticipated electric power industry jobs

Question: **What actions, including Canada-U.S. harmonized actions, should be taken to improve the training and availability of workers for the jobs that will need to be filled?**

Opportunities for Environmental Regulatory Harmonization (Conventional Air Pollutants, Renewables and Climate Policy)

Discussion framers: Alan Krupnick and Phil Gass

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Environmental Policy Harmonization (Krupnick, Gass, and Belausteguigotia)

- Background
  - Different types and stringency of regulations
  - Different regulatory processes
  - Different governance
- Conventional Air Pollution Policy (SO_2, NOx, ozone, PM, toxics)
  - Domestic policies (federalism; role of trading)
  - Addressing cross-border pollution institutionally (US: Sec. 115; Clean Air Coalition; joint pilot projects-trading feasibility study)
- Carbon Policy
  - INDCs (US: 26% by 2025; Canada: 30% by 2030)
  - Electricity-specific policies (Existing sources: US: CPP; Canada: plant lifetime defined)
  - Institutions: Western Climate Initiative/California and Quebec trading
- Renewables Policy
  - Mandates (RPS)
  - Incentives (tradable RPS; feed-in tarrifs, subsidies)
  - Manitoba Hydro and U.S. CPP

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Topics for discussion

- Cross-border trading in conventional air pollutants.
- Improvements in benefit-cost analyses and other regulatory processes to include impacts across the border.
- INDC Harmonization.
- Electricity Sector GHG Regulation.
- Common cap or carbon tax
- Renewable credit trading program
- Softer harmonization issues: monitoring and enforcement systems, reporting systems, research advances, and the strengthening of existing bilateral or trilateral institutions to better promote and coordinate North American harmonization policies.

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