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# **Carbon Pricing in the NYISO Wholesale Energy Market: Addressing Leakage**

**Integrating Public Policy Task Force  
Rensselaer, NY**

*Prepared on behalf of H.Q. Energy Services (U.S.), Inc.*

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# LEI is a global economic, financial and strategic advisory professional services firm

London Economics International LLC (“LEI”) combines detailed understanding of specific network and commodity industries, such as electricity generation and transmission, with sophisticated analysis and a suite of proprietary quantitative models to produce reliable and comprehensible results.

LEI has extensive experience in several areas, including:

## GENERATION:

- working with generation owners to forecast market conditions and evaluate future revenues
- Assessing the impact of new generation resources on capacity and energy prices

## TRANSMISSION:

- Advising on tariff design and other business issues for regulated & merchant transmission
- Conducting cost-benefit analysis around proposed transmission projects

## RENEWABLES:

- Working with developers to value potential revenue streams from Renewable Energy Credits (“RECs”) and/or emissions offsets
- Counseling governments and regulators on creating policies which efficiently incentivize investment in renewable energy

## NATURAL GAS:

- Assessing the synergies between the natural gas and electric power industries
- Examining performance-based ratemaking and total factor productivity for natural gas distribution companies

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# LEI reviewed the proposed carbon pricing mechanism for NYISO with a focus on addressing the leakage issue

H.Q. Energy Services (U.S.) (“HQUS”) asked London Economics International (“LEI”) to review the various options for pricing carbon into NYISO’s wholesale energy market, specifically potential methodologies to address leakage of emissions to and from neighboring areas

- LEI understands the proposed carbon pricing mechanism is intended to support New York’s decarbonization goals
- An important step towards combatting leakage involves the determination and attribution of a carbon emissions rate for import and export supply resources

The focus of our presentation today is the merits and drawbacks of various methodologies to address the geographic carbon emissions leakage issue

- LEI evaluated the methodologies using well-recognized regulatory and policymaking criteria such as economic efficiency, costs to consumers, impact on carbon emissions, feasibility and ease of implementation

# Internalizing the cost of carbon emissions within wholesale energy market prices is consistent with economic theory

- ▶ **Multiple approaches exist to help achieve policy objectives such as carbon reduction in the electricity sector, including**
  - Carbon charge applied to commitment and dispatch (proposed use of SCC)
  - Cap-and-trade mechanism, either state-specific or linked to existing program such as RGGI
- ▶ **The effectiveness of these methods for internalizing externalities may evolve over time as there are fewer carbon-emitting resources**
- ▶ **The overall effectiveness of the carbon pricing mechanism hinges on the proper design and implementation of specific elements of the program**
  - Given the proposed level of carbon emission costs, improper implementation of the mechanism could derail decarbonization objectives, and even distort underlying market signals
- ▶ **One such important issue is to address emissions leakage from neighboring areas**
  - Neighboring jurisdictions do not assess carbon emission costs in the same way that New York is proposing
  - Excluding external transactions, or improperly assessing the associated carbon emission rates, could misrepresent the clean attributes of import and export resources, and improperly skew the economic merit order of supply resources in the NYISO wholesale energy market

## Two general methods have been proposed to address leakage, so that internal and external resources are on a level playing field with respect to carbon pricing

### Carbon charge based on the New York MER

- Imports into New York are assessed a carbon charge based on the internal generation Marginal Emissions Rate (“MER”) at the appropriate border node in the NYISO energy market
- Simple to administer and prevents leakage by netting out impacts of carbon pricing for imports
- Does not reward cleaner imports or incentivize reducing carbon content of imports

### Resource or area-specific border assessment mechanism

- Importers are charged based on the carbon content of the supplying resources and the difference in carbon prices between the two markets, or based on the MER in the market of origin
- Reasonable to apply a well-informed average marginal emission rate, varying by neighboring market and season and on-peak versus off-peak period, to avoid complexities of accessing detailed, contemporaneous hourly data from neighboring markets or specific resources

**LEI believes that the more granular approach at assessing carbon emission rates for imports, based on resource or area-specific emission rates, is superior in terms of economic efficiency, market impacts, and emission reduction incentives**

# LEI reviewed methods for assessing emissions rate for imports using criteria of economic efficiency, market impacts, and emissions reduction incentives

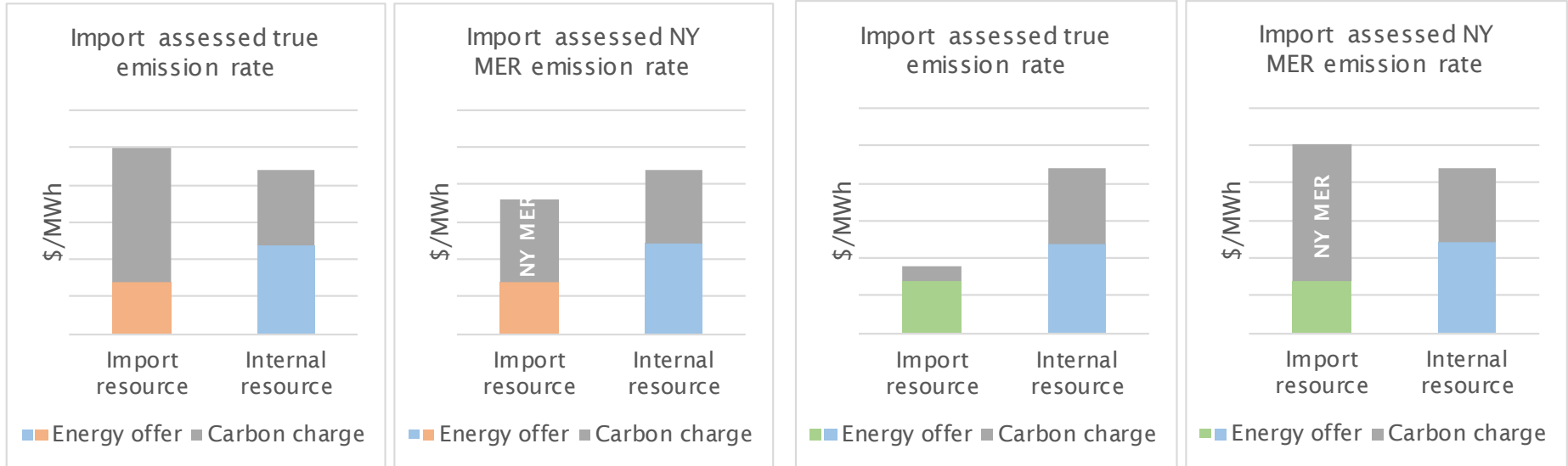
Carbon charge based on the New York MER	Resource or area-specific border assessment mechanism
<ul style="list-style-type: none"> <li>• It is intended to make imports indifferent to the level of carbon prices in New York, and keep in-state and external generation on an equal footing</li> <li>• External resources with lower emission rates than the internal MER will be assessed a carbon emissions rate higher than their true rate</li> <li>• External resources with higher emission rates than the internal MER see their economics improve relative to comparable in-state resources</li> </ul>	<ul style="list-style-type: none"> <li>• All electricity supply in New York is differentiated based on costs as well as emission rates, so this approach rewards external generators that are cheaper <i>and</i> cleaner</li> <li>• If each resource’s emissions profile cannot be made available to the NYISO, simplifying assumptions can be used to estimate the source area’s marginal emission rate</li> </ul>

- ▶ **A carbon charge on imports must consider their actual environmental value to avoid significantly distorting energy markets and disincentivizing current clean imports, or additional renewable energy imports**
  - Due to challenges of obtaining necessary information for granular calculations, a well-informed average marginal emissions rate, varying by jurisdiction of origin, season, and on-peak versus off-peak period, would be a reasonable approach
- ▶ **Any border charge mechanism must also account for carbon pricing schemes already in place in neighboring jurisdictions**

# Border carbon charge based on New York MER skews market signals by distorting economic merit order of imports

- ▶ A carbon charge on imports based on the New York MER meets the basic objective of including imports in carbon pricing scheme
  - However, “one rate fits all” principle could end up hurting decarbonization efforts, as neighboring areas have very different generation resources on the margin
  - It puts external generation that is cleaner than New York’s marginal resource at an economic disadvantage, and rewards external generation that is more polluting than the New York marginal resource

## Change in economic merit of imports under different border charge assessment mechanism



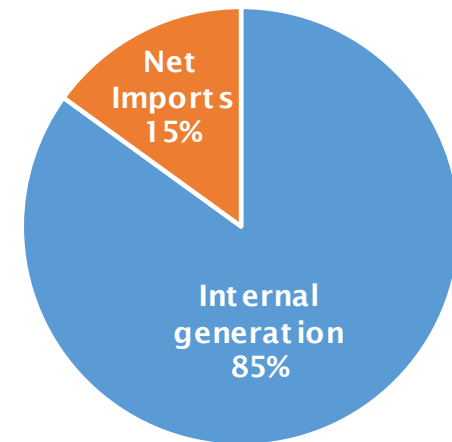
Import resource with intrinsic carbon emission rate above New York MER

Import resource with intrinsic carbon emission rate below New York MER

## Border carbon charge based on New York MER could lead to lower clean energy imports, increasing costs to meet CES targets

- ▶ **The Clean Energy Standard Order allows for the participation of Tier-1 eligible external resources to increase competition and reduce the cost for New York consumers of meeting decarbonization and clean energy goals**
- ▶ **Carbon charge for imports based on the New York MER could lead to reduced low-emission imports**
  - Legacy clean energy imports are included in the baseline calculation of renewable energy serving NYCA load; any reduction in such imports will require even more new Tier-1 eligible renewable generation to be built in-state, driving up costs for consumers
  - Loss of flexible renewable imports could also lead to increased costs in the capacity and ancillary services markets
- ▶ **Carbon charge for imports based on the New York MER would inhibit the development of new resources that are located outside the state, but would have marketed their energy into New York**
  - Reduced pool of potential suppliers of Tier-1 RECs could ultimately result in a higher price for the state's consumers

### Source of renewable generation included in Clean Energy Standard baseline



Source: 2015 NY DPS Staff White Paper on CES; NYISO 2015 Goldbook



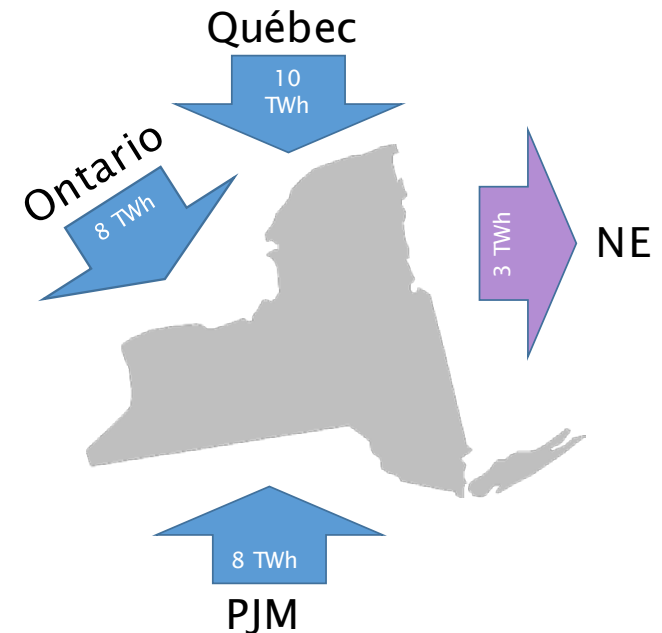
# Resource or area-specific border carbon charge incentivizes emissions reduction on a regional scale, and does not advantage external resources with emission rates higher than the internal MER

- ▶ Although simpler, a uniform border charge on all imports into New York would be a less efficient way to support the state's decarbonization objectives
  - External resources will not be fully leveraged to help achieve the State's decarbonization targets
- ▶ This approach does not fully address NYISO's concerns about emissions leakage
  - Diminished opportunities to reduce emissions not only from existing external generation supplying New York, but also from future resources
  - Potentially increased carbon emissions regionally if resources with intrinsic emission rates higher than the NY MER get dispatched
- ▶ Emission reductions should arise at a faster rate if the emissions rate treatment is done on a level playing field
  - "Level playing field" means a border carbon charging policy that reflects as much as possible the true emissions rate of each internal or external resource
  - Using a resource-specific MER can also help motivate infrastructure investment that supports decarbonization – for example, buildout of new transmission to increase imports of clean energy

In recent years more than 16 TWh\* of imports came from Canadian provinces with MER estimated to be significantly lower than the NY MER

Sources: NYISO data; Brattle Report, page 55

\* Assuming a portion of energy coming from Québec is wheeled to New England



# While a carbon charge based on the New York MER is simple, a more granular assessment is possible using simplifying assumptions as necessary

## Carbon charge based on the New York MER

- Relatively simple to apply and easy to administer
- No need for data from outside jurisdictions
- Need for a separate, resource or area-specific accounting of carbon emissions from imports for CES

## Resource or area-specific border assessment mechanism

- NYISO has access to information on import resources either through contractual agreements with specific resources, or through the NYGATS, which would enable assessing a resource-specific emission rate for imports
- Absent resource-specific data, or for “back-to-back” type transactions, calculating an average marginal emissions rate by jurisdiction of origin, season and on-peak versus off-peak period should not be an overly burdensome task
- Rates can be determined in advance, rather than being performed in real-time

Even if not perfect, with simplifying assumptions, a more granular border assessment mechanism based on the resource or area-specific emission rate of import resources is still much more precise than relying on the New York internal MER for imports

## Some concerns about the resource or area-specific border carbon charge are valid, however in the aggregate benefits outweigh drawbacks

**Concern:** Border carbon charge based on New York MER would generate more funds from charging clean imports, thus subsidizing consumers costs, than resource or area-specific approach

- However, downward impact on clean energy import levels from border carbon charge based on New York MER would increase costs for consumers, offsetting carbon revenue gains

**Concern:** Resource or area-specific approach could relocate renewable capacity investments out of state

- With a level playing field, projects with greater economic viability (whether in or out of state) will prevail and New York markets will benefit from the increased competition
- Higher levels of hydroelectric generation in New York's supply can help the system balance more variable generation from renewables without affecting system reliability

**Concern:** Marginal emissions of imports such as hydropower might be higher than near-zero if imports to New York were supplied by diverting flows that could have gone to other neighbors

- Emission rate for import resources should be based on intrinsic rate, not potential impacts in other jurisdictions
- This concern demonstrates bias against import resources – if existing clean energy resources inside the NYCA that are currently exporting their environmental attributes to other markets were to start selling their output in the NYISO markets, should these resources be assigned a carbon emission rate equal to the replacement resources in their previous export markets?
- Pushing the argument further, should new renewable resources built in the NYCA be assigned non-zero emission rates because, by choosing not to export their output to another jurisdiction, a potentially carbon-emitting resource will be dispatched in that region?

## Improper carbon charge assessment for import resources could result in lower imports of hydropower from Canada, with multi-faceted, negative economic consequences for New York consumers

How could the border charge assessment mechanism potentially affect sales of renewable energy from Québec in the NYISO wholesale markets?

- ▶ **Existing energy imports from Québec are overwhelmingly from large-scale hydro**
  - Importers include HQUS (99% hydro generation portfolio), Nalcor (Churchill Falls), Brookfield (Lièvre River)
- ▶ **Market conditions that lower the value of clean energy imports into New York, or any energy market design change that adversely impacts the economics of import offers, would ultimately result in lower levels of clean energy imports, including from Québec, into New York**
  - Québec is interconnected to multiple neighboring provinces and states: New Brunswick, Ontario, New York, and New England
- ▶ **Lower levels of clean energy imports, such as hydropower, will have economic consequences for New York customers (impacts can be analyzed in Issue Track 5)**
  - Increased cost of procuring RECs from tier-1 eligible resources to make up for lost baseline renewable generation
  - Higher capacity market IRM to account for additional intermittent generation, following decline in intermittent generation balancing service provided by flexible imports
  - Potential need for more ancillary services to integrate additional internal intermittent generation
  - Additional investments in local transmission system to integrate these intermittent generators

The province of Québec is already part of the Western Climate Initiative cap-and-trade program, which must be taken into consideration when assessing the New York carbon border charge

