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Import Carbon Pricing

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What if any market structure should we include to address external ISO's that already have some carbon price incorporated?

- NYISO has ruled out using the actual hourly MER of each external ISO at this juncture since it is too complicated to calculate and creates tracking problems for wheels among external ISOs with different MERs.
- NYISO observes that marginal emissions are much more consistent than average emissions among ISOs/RTOs.
- The proposal so far only removes RGGI pricing when considering external transactions from or to RGGI states.

Import Carbon Pricing

But assuming the MERs of adjoining ISOs/RTOs are similar, there are still fundamental differences in the degree to which carbon is already factored into the LBMP.

- For price-sensitive external transactions sensitive to the price of carbon, NYISO's proposed approach gives neither an efficient carbon free dispatch nor efficient dispatch when damage costs of carbon are considered using the Societal Cost of Carbon (SCC).
- But if MERs are similar, why not get more power from ISOs/RTOs where the cost of power absent carbon charges is lowest?

Proposal

Schedule price-sensitive transactions based on the carbon-free price of energy in each zone.

- NYISO would back out the price of carbon in each external zone and compare it to the NY price backing out the price of carbon based on NY MER.
- (Alternatively, if available, the average MER of each external ISO/RTO interface also could be used, rather than assuming that all MERs are roughly equal.)

Simple Example – Two Generator System

Suppose an importing area has two generators and one potential import.

Generator 1:

- Energy Cost - a 96 MW, 8,000 Heat Rate unit burning gas at $3/MMBTU for an Energy cost component of $24/MWh.
- Carbon Damage Cost - With gas at 113 lbs CO2/MMBtu, the unit's marginal emissions rate is 0.452 Tons/MWh, at $60/ton yields a $27.12/MWh carbon adder, RGGI alone at $17/ton adds $7.68/MWh
- Total marginal cost Generator 1 - $51.12/MWh
- Dispatch price w/RGGI - $31.68/MWh

Simple Example – Two Generator System

Generator 2:

- Energy Cost - a 20 MW, 10,000 Heat Rate unit burning gas at $3/MMBTU for an Energy cost component of $30/MWh.
- Carbon Cost - With gas at 113 lbs CO2/MMBTU, the unit's marginal emissions rate is 0.565 Tons/MWh, at $60/ton yields a $33.90/MWh carbon adder. RGGI alone at $17/ton adds $9.61/MWh.
- Total marginal cost Generator 2 - $63.90/MWh
- Dispatch price w/RGGI - $39.61/MWh

Simple Example – Two Generator System

Potential Import:

- Marginal Unit Energy Cost - a 5 MW, 9,000 Heat Rate unit burning gas at $3/MMBTU for an Energy cost component of $27/MWh.
- Carbon Cost - With gas at 113 lbs CO2/MMBTU, the unit's marginal emissions rate is 0.509 Tons/MWh, $60/ton yields a $30.51/MWh carbon damage cost adder.
- But at external system's carbon price of $30/ton, yields a carbon adder of $15.26/MWh.
- Total marginal cost Potential Import - $42.26/MWh at their carbon price, $57.51/MWh at NY's carbon damage cost.

Example

Suppose there is a two zone system, an adjoining system has a $30/ton carbon price and NY with a $17/ton RGGI price and $53 SCC adder for a total $60/ton carbon price. Case 1

External Zone Marginal Energy Price $27/MWh

External Zone Marginal Carbon Price $15.26/MWh

NY Marginal Energy Price $30/MWh

NY Marginal Carbon Price $33.90/MWh

Burdened external Price $42.26/MWh exceeds NY carbon free price $30/MWH and RGGI only dispatch price $39.61/MWh.

Transaction does not flow; however, evaluated on a carbon free or carbon burdened basis transaction would flow.

Would NY Load Pay More if Carbon were Backed out of the external Pool's Price?

Suppose there is 100 MW of load that can buy from NYISO internally or up to 5 MW from imports.

- In the example posited, scheduling the transaction would change the marginal unit in NY - demonstrating that NYISO's proposed scheduling approach can increase marginal costs.
- NYISO's proposed approach can also increase carbon emissions.

Dispatch and Pricing Summary
NYISO Proposed Approach

	Fuel Cost $ /MWh	CO2 Rate Tons/ MWh	CO2 Disp. Cost $ /MWh	Total Disp. Cost $ /MWh	Out-put MWh	NYISO. LBMP $ /MWh	CO2 Tons	Total Cost $
Gen 1	24.00	0.452	7.68	31.68	96	63.90	43.4	6,134
Gen 2	30.00	0.565	9.61	39.61	4	63.90	2.3	256
Import	27.00	0.509	15.26	42.26	0			
Total					**100**		**45.7**	**6,390**

NYISO proposes to compare import cost with external carbon price included to NY's RGGI-only carbon price and schedule accordingly.

Dispatch and Pricing Summary
Carbon Free Import Dispatch

	Fuel Cost $ /MWh	CO2 Rate Tons/ MWh	CO2 Cost $ /MWh	Total Cost $ /MWh	Out-put MWh	LBMP $ /MWh	CO2 Tons	Total Cost $
Gen 1	24.00	0.452	27.12	51.12	95	51.12	42.9	4,856
Gen 2	30.00	0.565	33.90	63.90				
Import	27.00	0.509	15.26	42.26	5	51.12	2.5	256
Total					**100**		**45.5**	**5,112**

But in this example, comparing carbon free prices of both would favor import.
It would also lower prices and carbon emissions.

Dispatch and Pricing Summary
Carbon Damage Import Dispatch

	Fuel Cost $ /MWh	CO2 Rate Tons/ MWh	CO2 Cost $ /MWh	Total Cost $ /MWh	Out-put MWh	LBMP $ /MWh	CO2 Tons	Total Cost $
Gen 1	24.00	0.452	27.12	51.12	96	57.51	42.5	5,521
Gen 2	30.00	0.565	33.90	63.90				
Import	27.00	0.509	30.51	57.51	4	57.51	2.0	230
Total					**100**		**44.5**	**5,751**

Using NY's damage cost estimates for both internal generation and imports to dispatch imports would also favor import, reduce prices and reduce carbon emissions.