

# Additional Updates to the Carbon Pricing Proposal

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# Agenda

- Purpose
- Background
- Opportunity Cost Resources

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# Purpose

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- Stakeholders requested that the NYISO review its proposed treatment of resources bidding opportunity costs during LBMP Carbon Impact presentation at the **10/29/2018 IPPTF meeting**.
  - The NYISO had proposed that the estimated carbon adjustment used for carbon free resources bidding opportunity costs in calculating the  $LBMP_c$  should be \$0.00 when such resources are marginal.

\*See 10/29/2018 IPPTF LBMP Carbon Impact presentation at the following link:

[http://www.nyiso.com/public/webdocs/markets\\_operations/committees/bic\\_miwg\\_ipptf/meeting\\_materials/2018-10-29/10.29.2018%20IPPTF%20-%20LBMP%20Carbon%20Impact%20Calculation%20FINAL.pdf](http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg_ipptf/meeting_materials/2018-10-29/10.29.2018%20IPPTF%20-%20LBMP%20Carbon%20Impact%20Calculation%20FINAL.pdf)



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# Purpose

- **As a result of stakeholder feedback, the NYISO reviewed and is revising its proposal.**
  - When carbon free resources bidding opportunity costs are marginal, a non-zero estimated carbon bid adjustment will be used for such resources in the calculation of  $LBMP_C$ .

# Background

# LBMP Carbon Impact (LBMP<sub>c</sub>)

- The LBMP<sub>c</sub> will be charged to import transactions and credited to export transactions.
  - This design will allow transaction flows to be approximately the same as before carbon pricing, as well as help to prevent leakage of emissions.
- The estimated carbon bid adjustment of the marginal resources on the system will be used to calculate LBMP<sub>c</sub>.

# Background

- The NYISO's carbon reference level for the share of the marginal resource bid(s) associated with their anticipated carbon charge will be used to calculate the LBMP Carbon Impact ( $LBMP_C$ ).
  - If the marginal resource is subject to the Regional Greenhouse Gas Initiative ("RGGI"), then the net Social Cost of Carbon ("SCC") will be utilized to determine the carbon reference level for the resource.
    - Such resources will ultimately be charged the net SCC for emissions.
  - If the marginal resource is not subject to RGGI, then the SCC will be utilized to determine the carbon reference level for the resource.
    - Such resources will ultimately be charged the SCC for emissions.



# Background (continued)

- The NYISO's carbon reference level for the share of the marginal resource bid(s) associated with their anticipated carbon charge will be used to calculate the LBMP Carbon Impact (LBMP<sub>c</sub>).
  - If the marginal resource is carbon free or qualifies under the Clean Energy Standard ("CES"), then the NYISO will utilize a \$0.00 carbon reference level for the resource.
    - Such resources will ultimately not be charged for emissions.
  - If the marginal resource is a carbon free resource bidding opportunity cost, then the carbon reference level for the resource will be estimated using emissions that would likely be displaced by production from the resource bidding opportunity cost.
    - Carbon free resources bidding opportunity cost will ultimately not be charged for emissions.
- The NYISO will post a single LBMP<sub>c</sub> for each zone and proxy bus.

# Opportunity Cost Resources

# Opportunity Cost Resources

- **Certain carbon free resources are able to store energy.**
  - These resources structure their bids to achieve schedules during the most economic periods of the day.
    - In periods of the day with lower prices, the bids of such resources therefore reflect the estimated opportunity cost of profit from periods of the day with higher prices.
- **The LBMP is expected to increase slightly under carbon pricing to reflect the emissions of the marginal unit.**
  - Carbon free opportunity cost resource bids are likely to increase as a result of carbon pricing in some hours.

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# Opportunity Cost Resources

- In response to stakeholder feedback, the NYISO has revised its proposed treatment of carbon free resources bidding opportunity cost.
  - The estimated carbon bid adjustment of carbon free resources bidding opportunity costs will be used in the calculation of  $LBMP_C$ .

# Opportunity Cost Resources

- Using the estimated carbon bid adjustment of opportunity cost resources in the calculation of  $LBMP_C$  will better reflect the impact of carbon pricing.
  - This will lead to export/import transaction flows that more appropriately reflect what flows would have been absent carbon pricing.
- Setting \$0  $LBMP_C$  when carbon free resources bidding opportunity costs are on the margin would cause leakage of emissions.
  - External resources would receive the full increase in the NYISO LBMP due to carbon during hours when a carbon free resource bidding opportunity cost is on the margin.
    - These increased revenues to the external resources would occur regardless of the resource type backing the transaction (i.e., external emitting and carbon free resources would both receive the increased revenue).
  - If this approach is chosen, imports could potentially increase during hours when carbon free resources bidding opportunity cost are on the margin.

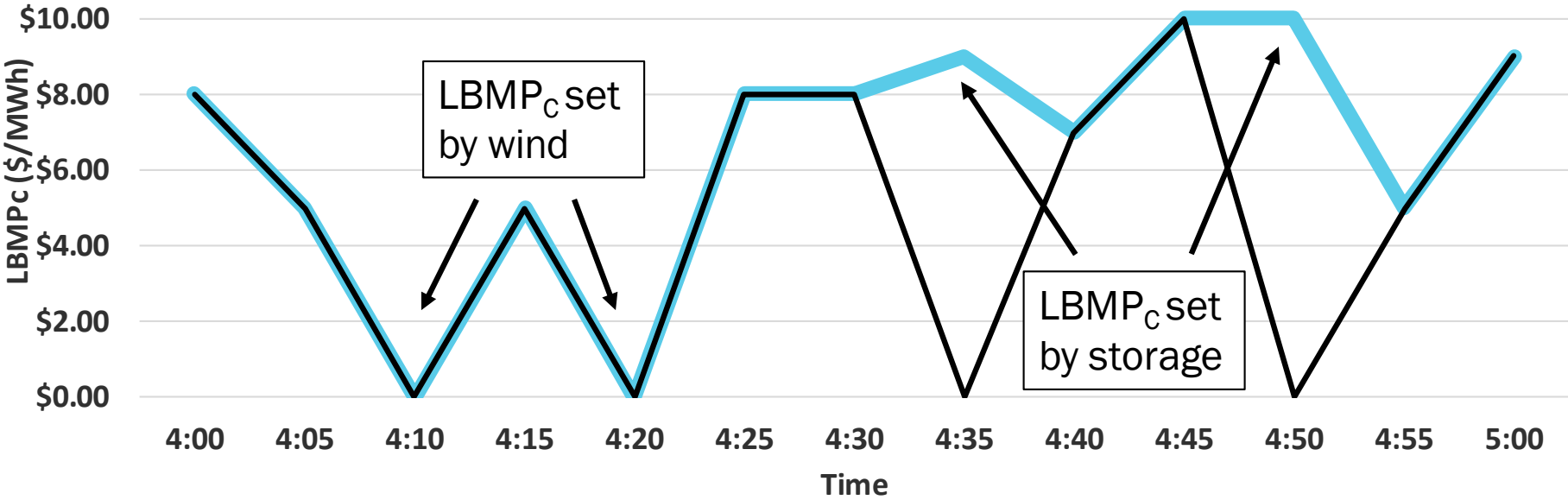
# Opportunity Cost Resources

- Import/ export schedules are expected to be more similar to before carbon pricing when estimated carbon bid adjustment for opportunity cost resources are used in the calculation of  $LBMP_c$ .
  - The table below provides a high level example.

Variable	Before Carbon Pricing		After Carbon Pricing, No Opportunity Cost Carbon Adjustment in $LBMP_c$ Calculation		After Carbon Pricing, with Opportunity Cost Carbon Adjustment in $LBMP_c$ Calculation	
	Import	Opportunity Cost Resource	Import	Opportunity Cost Resource	Import	Opportunity Cost Resource
LBMP	40	40	40	40	45	45
Total Resource Bid	40	40	40	45	45	45
Estimated Carbon Bid Adjustment	0	0	0	5	5	5
Schedule	1 MW	1 MW	2 MW	0 MW	1 MW	1 MW

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# Illustration of Potential LBMP<sub>c</sub> Volatility\*



- LBMP<sub>c</sub>, Carbon Free Opportunity Cost Resource Carbon Adjustment is Non-Zero
- LBMP<sub>c</sub>, Carbon Free Opportunity Cost Resource Carbon Adjustment is Zero

\*Data presented is for illustrative purposes only, and is not based on actual market outcomes.

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- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



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