

Carbon Pricing in PJM

CPSTF

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IMM



Monitoring Analytics

Carbon Pricing

- **PJM Markets provide a flexible mechanism to limit carbon output by incorporating a consistent carbon price in unit offers which would be reflected in PJM's economic dispatch**
- **The MMU recommends that PJM provide a full analysis of the impact of carbon pricing on PJM generating units and carbon pricing revenues to the PJM states in order to permit the states to consider a potential agreement on the development of a multistate framework for carbon pricing and the distribution of carbon revenues.**

Carbon Pricing Impacts on SRMC

- **With carbon at \$10 per metric ton, short run marginal costs would increase by**
 - **\$4.90 per MWh (25.1 percent) for a new CT**
 - **\$3.34 per MWh (24.3 percent) for a new CC**
 - **\$8.63 per MWh (31.2 percent) for a new CP**
- **With carbon at \$50 per metric ton, short run marginal costs would increase by**
 - **\$24.52 per MWh (125.4 percent) for a new CT**
 - **\$16.72 per MWh (121.5 percent) for a new CC**
 - **\$43.15 per MWh (155.8 percent) for a new CP**

Carbon Pricing Impacts on LMP

- MMU Estimates of LMP Impacts***

2018				2019		
Carbon Price (\$/Metric Ton)	Actual LMP (\$/MWh)	Estimated LMP (\$/MWh)	Percent Change	Actual LMP (\$/MWh)	Estimated LMP (\$/MWh)	Percent Change
\$5.00	\$38.24	\$39.94	4.4%	\$27.32	\$28.94	5.9%
\$10.00	\$38.24	\$41.80	9.3%	\$27.32	\$30.71	12.4%
\$15.00	\$38.24	\$43.66	14.2%	\$27.32	\$32.48	18.9%

- PJM (scenarios with MD, DE, NJ, PA, VA in carbon region and no leakage mitigation) found that LMPs in the carbon region were**
 - 6.9 percent higher with carbon at \$7.57 per metric ton**
 - 16.9 percent higher with carbon at \$16.40 per metric ton**

* The MMU analysis reflects the impact of carbon pricing on the marginal units' offer prices. The calculation is not based on a counterfactual redispatch of the system.

Carbon Allowance Revenue

- **RGGI auction revenue is returned to the states and the states control how the revenue is used**
- **RGGI generated \$284 million in auction revenue for 2019; \$3.5 billion since 2008**
- **An emissions cap at five percent below 2019 carbon emission levels would generate carbon allowance revenue in PJM states totaling**
 - **\$2.0 billion per year with the carbon price at \$5.65 per short ton**
 - **\$3.6 billion per year with the carbon price the \$10.00 per short ton**

RPS in PJM

- **Consumers in PJM States paid \$925 million for RPS Compliance in 2017**
- **Consumers in PJM States paid more than \$4.4 billion for RPS Compliance in the five year period 2014 – 2018**
- **REC and SREC prices are not consistent across PJM**
 - **Price of carbon implied by REC prices varied from \$5.63 to \$19.21 in 2019**
 - **Price of carbon implied by SREC prices varied from \$50.23 to \$806.35 per metric ton in 2019**

Efficient Carbon Pricing

- **PJM Markets provide efficient price signals that permit valuation of resources with very different characteristics when they provide the same product**
- **A consistent carbon price in the PJM region would be the most efficient way to implement a social decision to limit carbon**
- **The use of inconsistent implied carbon prices by state is inconsistent with an efficient market and inconsistent with the least cost approach to meeting state environmental goals**

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