

Carbon Pricing

Carbon Residual Allocation

Ethan D. Avallone

SENIOR MARKET DESIGN SPECIALIST – ENERGY MARKET DESIGN

Market Issues Working Group (MIWG)

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Agenda

- Purpose
- Background
- Carbon Residual Allocation
- Proportional Carbon Residual Allocation Example
- Carbon Pricing Timeline

Purpose

Purpose

- **This presentation will provide a detailed example of the proportional carbon residual allocation methodology.**
 - Return carbon residuals to LSEs based on the proportional effect carbon pricing has on their gross payments for energy.
 - The proportional allocation equalizes the (\$/MWh Residual Allocation)/LBMPc for each zone.
- **Load Serving Entities (LSEs) will receive an allocation of the carbon residual that results from charging suppliers for their carbon emissions.**
 - The NYISO intends to allocate these residuals to load serving entities (LSEs).
 - The carbon residual allocation will not affect revenues to generators, who would receive the LBMP, inclusive of the carbon impact.

Background

Background

- At the June 4, 2018 IPPTF meeting, the NYISO provided an overview of the carbon residual allocation options.*
 - The NYISO recommended the Cost Levelizing Approach at this meeting.
- At the September 24, 2018 IPPTF meeting, the Brattle Group provided a comparison of the carbon residual allocation options as part of the carbon pricing consumer impact analysis.^
- At the October 29, 2018 IPPTF meeting, the NYISO revised its recommended carbon residual allocation to the proportional allocation methodology after consideration of the Brattle Group's findings.¹
 - When considering dynamic effects, as demonstrated by Brattle at the September 24, 2018 IPPTF meeting, the proportional allocation methodology minimizes cost shifts among consumers (see scenario C in the chart at Appendix I).

*For further information, please see the presentation at the following link: https://www.nyiso.com/documents/20142/1401870/2018-06-04_IPPTF%20residual%20allocation-repost.pdf/ec456c48-fa08-2a65-8e6a-d92988445fd9

^For further information, please see the presentation at the following link:

https://www.nyiso.com/documents/20142/2625121/2018_09_20%20Zonal%20and%20Seams%20Issues.pdf/17f965c7-bcda-3b9f-9b1e-19958d2c6574

¹For further information, please see the presentation at the following link:

<https://www.nyiso.com/documents/20142/3716686/10.29.2018%20IPPTF%20-%20Carbon%20Residual%20Allocation%20FINAL.pdf/35b5eb94-e885-82e3-796c-bd20a8e25f5d>



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Carbon Residual Allocation

- **The carbon residual is the total dollar amount of carbon charges collected by the NYISO from suppliers and allocated to loads.**
- **Suppliers will receive the full LBMP and then pay for emissions.**
 - Import transactions will be charged the applicable LBMPc and export transactions will be credited the applicable LBMPc.
- **LSEs will pay the full LBMP, including the effect of the carbon charge on LBMP.**
 - The NYISO will then allocate the carbon residual to each LSE using the proportional carbon residual allocation methodology.

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Carbon Residual Allocation

- The carbon residual allocation will use the LBMPc from the binding real-time interval (nominally 5-minutes) to calculate the time-weighted integrated (TWI) LBMPc.
 - Supplier emissions will be reported on an hourly basis; the carbon residual will therefore be on an hourly basis.
 - TWI LBMPc, the hourly carbon residual, and RT actual internal load, will be used to determine the allocation.
- The NYISO is considering how to calculate the carbon residual allocation under two scenarios thought to be unlikely, and is open to stakeholder feedback on how to perform the allocation under each scenario:
 - The LBMPc for a given zone is less than zero.
 - The following example assumes an LBMPc for each zone of zero or greater.
 - The carbon residual is less than zero.
 - The following example assumes a positive carbon residual.

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Proportional Carbon Residual Allocation Example

Proportional Carbon Residual Allocation Example

i	ii	iii	iv
Total Carbon Residual	Location	Load -MWH	LBMPc (\$/MWh)
200,000	A	3,000	23.00
	B	800	0.00
	C	1,600	5.00
	D	700	20.00
	E	1,000	1.00
	F	2,000	7.00
	G	500	20.00
	H	700	11.00
	I	1,000	5.00
	J	7,000	0.00
	K	3,500	10.00
	Total	21,800	

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Proportional Carbon Residual Allocation Example

i	ii	iii	iv	v	vi
				(iii*iv)	(v/(sum(v)))
Total Carbon Residual	Location	Load -MWH	LBMPc (\$/MWh)	Gross Zone Carbon Impact (\$)	Share of Gross Carbon Payments by LSE in Zone (%)
200,000	A	3,000	23.00	69,000	42.15%
	B	800	0.00	-	0.00%
	C	1,600	5.00	8,000	4.89%
	D	700	20.00	14,000	8.55%
	E	1,000	1.00	1,000	0.61%
	F	2,000	7.00	14,000	8.55%
	G	500	20.00	10,000	6.11%
	H	700	11.00	7,700	4.70%
	I	1,000	5.00	5,000	3.05%
	J	7,000	0.00	-	0.00%
	K	3,500	10.00	35,000	21.38%
	Total	21,800		163,700	

Proportional Carbon Residual Allocation Example

i	ii	iii	iv	v	vi	vii	viii	ix
				(iii*iv)	(v/(sum(v)))	(vi*(x))	(vii/iii)	viii/iv
Total Carbon Residual	Location	Load -MWh	LBMPc (\$/MWh)	Gross Zone Carbon Impact (\$)	Share of Gross Carbon Payments by Zone (%)	Carbon Residual Allocation (\$)	Carbon Residual Rate (\$/MWh)	Proportion
200,000	A	3,000	23.00	69,000	42.15%	84,300.55	28.10	1.22
	B	800	0.00	-	0.00%	-	-	-
	C	1,600	5.00	8,000	4.89%	9,773.98	6.11	1.22
	D	700	20.00	14,000	8.55%	17,104.46	24.43	1.22
	E	1,000	1.00	1,000	0.61%	1,221.75	1.22	1.22
	F	2,000	7.00	14,000	8.55%	17,104.46	8.55	1.22
	G	500	20.00	10,000	6.11%	12,217.47	24.43	1.22
	H	700	11.00	7,700	4.70%	9,407.45	13.44	1.22
	I	1,000	5.00	5,000	3.05%	6,108.74	6.11	1.22
	J	7,000	0.00	-	0.00%	-	-	-
	K	3,500	10.00	35,000	21.38%	42,761.15	12.22	1.22
	Total	21,800		163,700		200,000.00		

Proportional Carbon Residual Allocation Example

Zone	Load	LBMPc (\$/MWh)	Allocation Rate (\$/MWh)
A	3,000.00	23.00	28.10
B	800.00	0.00	0.00
C	1,600.00	5.00	6.11
D	700.00	20.00	24.43
E	1,000.00	1.00	1.22
F	2,000.00	7.00	8.55
G	500.00	20.00	24.43
H	700.00	11.00	13.44
I	1,000.00	5.00	6.11
J	7,000.00	0.00	0.00
K	3,500.00	10.00	12.22

- The zonal allocation rate (\$/MWh) is used to allocate the carbon residual to each LSE.
 - The NYISO will post the zonal allocation rate for each load zone.

Proportional Carbon Residual Allocation Example

			i
LSE	Zone	Zone Load (MWh)	LSE Load (MWh)
LSE1	A	3,000.00	1,000.00
LSE2	A		1,000.00
LSE3	A		1,000.00
LSE1	B	800.00	800.00
LSE1	C	1,600.00	1,600.00
LSE3	D	700.00	525.00
LSE3	D		175.00
LSE1	E	1,000.00	1,000.00
LSE2	F	2,000.00	1,200.00
LSE3	F		800.00
LSE1	G	500.00	500.00
LSE1	H	700.00	350.00
LSE3	H		350.00
LSE3	I	1,000.00	500.00
LSE2	I		500.00
LSE2	J	7,000.00	2,100.00
LSE1	J		1,400.00
LSE3	J		3,500.00
LSE2	K	3,500.00	875.00
LSE3	K		2,625.00

- A single LSE may serve load in many different zones.

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Proportional Carbon Residual Allocation Example

			i	ii	(i*ii)
LSE	Zone	Zone Load (MWh)	LSE Load (MWh)	Allocation Rate (\$/MWh)	LSE Allocation Revenue (\$)
LSE1	A	3,000.00	1,000.00	28.10	28,100.18
LSE2	A		1,000.00	28.10	28,100.18
LSE3	A		1,000.00	28.10	28,100.18
LSE1	B	800.00	800.00	-	-
LSE1	C	1,600.00	1,600.00	6.11	9,773.98
LSE3	D	700.00	525.00	24.43	12,828.34
LSE3	D		175.00	24.43	4,276.11
LSE1	E	1,000.00	1,000.00	1.22	1,221.75
LSE2	F	2,000.00	1,200.00	8.55	10,262.68
LSE3	F		800.00	8.55	6,841.78
LSE1	G	500.00	500.00	24.43	12,217.47
LSE1	H	700.00	350.00	13.44	4,703.73
LSE3	H		350.00	13.44	4,703.73
LSE3	I	1,000.00	500.00	6.11	3,054.37
LSE2	I		500.00	6.11	3,054.37
LSE2	J	7,000.00	2,100.00	-	-
LSE1	J		1,400.00	-	-
LSE3	J		3,500.00	-	-
LSE2	K	3,500.00	875.00	12.22	10,690.29
LSE3	K		2,625.00	12.22	32,070.86
					200,000.00

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Carbon Pricing Timeline

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Carbon Pricing Timeline

MIWG Meeting Date	Topic/ Deliverable
Tuesday, January 15, 2019	Import/ Export Transaction Examples
Tuesday, January 22, 2019	Overview of Impacted Tariff Sections
Thursday, January 24, 2019	Carbon Residual Allocation
Thursday, January 31, 2019	Tariff Revisions Discussion
Monday, February 4, 2019	Carbon Residual Allocation
Friday, February 15, 2019	LBMPc Calculation – Identifying the Marginal Unit(s)
	Tariff Revisions Discussion
Monday, March 4, 2019	Carbon Bid Adjustment for Opportunity Cost Resources
Monday, March 18, 2019	Tariff Revisions Discussion

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



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