Carbon Residual Allocation

Proposal Update

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Agenda

- Purpose
- Background
- Allocation Design Objectives
- NYISO Proposal Update
- Appendix I: Analysis of Carbon Charge Residual Allocation Methodologies*

Purpose

- **Load Serving Entities (LSEs) will receive an allocation of the carbon charge residual that results from charging suppliers for their carbon emissions.**
  - The NYISO intends to allocate these residuals to load serving entities (LSEs) as an offset to their energy charges in weekly settlements.
  - How NYISO allocates these residuals will affect the net costs customers pay throughout the state; the key question is how to allocate in relation to the different LBMP Carbon Impact ($LBMP_C$) in each zone.
  - Allocation would not affect revenues to generators, who would receive the LBMP, inclusive of the carbon impact.

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, the Brattle Group provided a comparison of the carbon residual allocation options as part of the carbon pricing consumer impact analysis.^

*For further information, please see the presentation at the following link:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg_ipptf/meeting_materials/2018-06-04/2018-06-04_IPPTF%20residual%20allocation-repost.pdf

^For further information, please see the presentation at the following link:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg_ipptf/meeting_materials/2018-09-24/2018_09_20%20Zonal%20and%20Seams%20Issues.pdf

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Background – Review of Allocation Options*

Least levelized net effect[1]

Most Levelized net effect

Allocation Approach	Description
(A) Load-Ratio Allocation	Each LSE receives the same $/MWh residual allocation
(B) Proportional Percentage Levelization Allocation	All LSEs face same % increase in net energy payments over non-carbon LBMPs; that is, equalize (LBMPc – $/MWh Residual Allocation) / (LBMP – LBMPc)
(C) Proportional Allocation	Allocation covers equal % of carbon payments; that is, equalize ($/MWh Residual Allocation) / LBMPc
(D) Levelizing Allocation	Each LSE faces the same $/MWh net carbon payments

NYISO Draft Recommendations propose **Levelizing Allocation** because it prioritizes avoiding major cost shifts across zones, despite eliminating an efficient price signal that internalizes the costs of CO_2 emissions

Notes:

1. Levelized w.r.t. net carbon payments (LMBPc – $/MWh Allocated Residuals), not w.r.t. a comparison to an alternative (unobservable) world without carbon charges and associated differences in RECs/ZECs/TCCs/changes in supply & demand.
2. "LBMPc" refers to the carbon effect on LBMP, as determined by the marginal price-setting units' emission rates and carbon charges.

*This slide was retrieved from Brattle's September 24, 2018 IPPTF presentation, located at the following link: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg_ipptf/meeting_materials/2018-09-24/2018_09_20%20Zonal%20and%20Seams%20Issues.pdf

Allocation Design Objectives

- **Allocation mechanisms can be evaluated against at least two design objectives:**
  - Aligning LBMPs with the marginal cost of serving load
    - Incentivize customers to reduce emissions when economic to do so (accounting for externalities).
  - Avoiding major cost shifts among customers
    - Carbon charges will impact customer costs, and the allocation of carbon residuals/ funds may moderate that impact.

NYISO Proposal Update

- **The NYISO recommends the proportional allocation approach.**
- **The NYISO straw proposal originally proposed the levelizing approach; the NYISO has revised its recommendation due to recent analysis.**
  - 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).
  - The proportional percentage levelization and the proportional allocation options may each provide an equitable allocation of the carbon charge residual to load.
    - The fact that there is a higher percentage impact to upstate load relative to downstate load under this methodology compared with the proportional percentage allocation was considered.
    - However, the proportional allocation option provides an equitable impact to consumers that is consistent with the current REC contract cost allocation to load.

Appendix I: Analysis of Carbon Charge Residual Allocation Methodologies*

*All charts and tables in this presentation were retrieved from Brattle's September 24, 2018 IPPTF presentation, located at the following link: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg_ipptf/meeting_materials/2018-09-24/2018_09_20%20Zonal%20and%20Seams%20Issues.pdf

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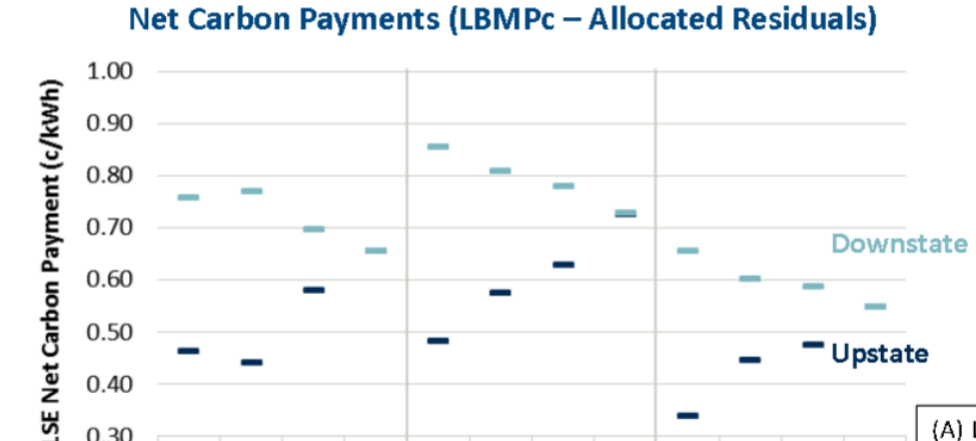
Analysis of Carbon Charge Residual Allocation Methodologies

- The chart at right shows the results of allocating the carbon residual to load using consumer impact analysis data.
  - However, this data does not include the dynamic effects of carbon pricing on LBMP.

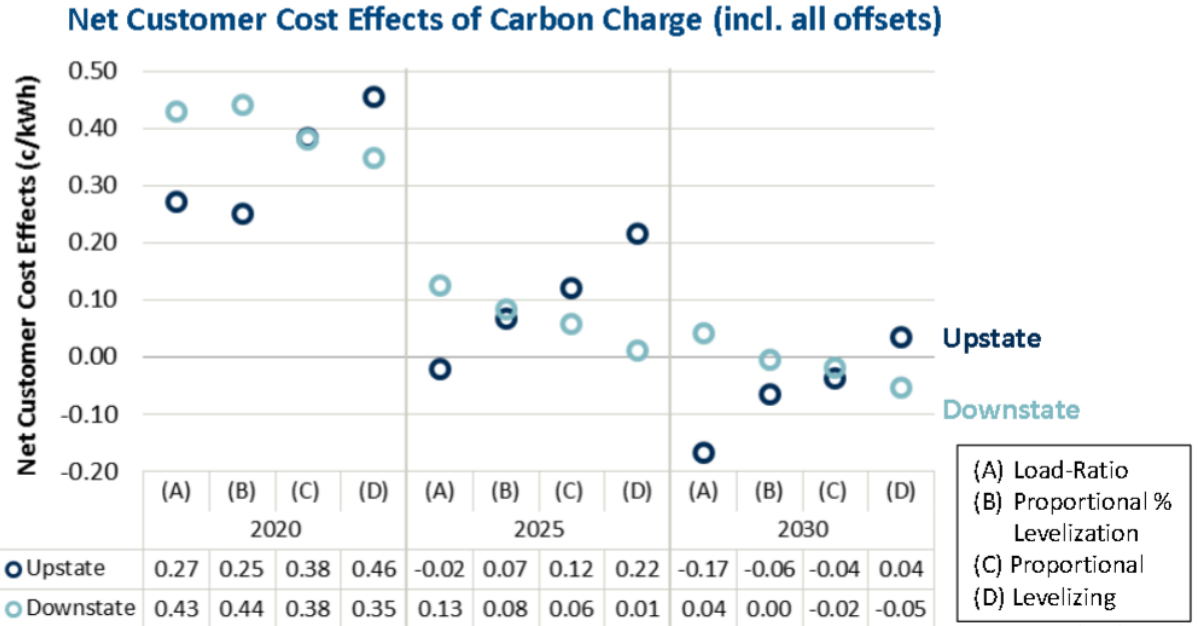


	2020				2025				2030			
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
Upstate	0.46	0.44	0.58	0.66	0.48	0.58	0.63	0.73	0.34	0.45	0.47	0.55
Downstate	0.76	0.77	0.70	0.66	0.86	0.81	0.78	0.73	0.66	0.60	0.59	0.55

Note: Proportional % levelization (B) can result in a wider range of costs than load-ratio share (A) if the % increase in gross energy payments due to carbon is greater Upstate than it is Downstate, such as in 2020.

Analysis of Carbon Charge Residual Allocation Methodologies

- The chart at right shows the results of allocating the carbon residual to load using consumer impact analysis data, after considering the impact to the LBMP from dynamic effects brought about by carbon pricing.
  - Considering dynamic effects, the proportional allocation methodology provides the most levelized allocation.



	2020 (A)	2020 (B)	2020 (C)	2020 (D)	2025 (A)	2025 (B)	2025 (C)	2025 (D)	2030 (A)	2030 (B)	2030 (C)	2030 (D)
Upstate	0.27	0.25	0.38	0.46	-0.02	0.07	0.12	0.22	-0.17	-0.06	-0.04	0.04
Downstate	0.43	0.44	0.38	0.35	0.13	0.08	0.06	0.01	0.04	0.00	-0.02	-0.05

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Allocation: Zonal Details, 2020

Customer Cost Impact of a $42/ton Carbon Charge, 2020
(cents/kWh)

	NYCA Average	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F	Zone G	Zone H	Zone I	Zone J	Zone K
STATIC ANALYSIS												
I. Static Increase in LBMPs	1.644	1.442	1.427	1.486	1.378	1.488	1.730	1.698	1.709	1.713	1.746	1.789
II. Customer Credit from Emitting Resources - (A) Load-Ratio Allocation	-0.987	-0.987	-0.987	-0.987	-0.987	-0.987	-0.987	-0.987	-0.987	-0.987	-0.987	-0.987
II. Customer Credit from Emitting Resources - (B) Proportional % Levelization	-0.987	-1.043	-1.002	-1.029	-0.922	-0.984	-0.973	-0.953	-0.957	-0.958	-0.983	-0.977
II. Customer Credit from Emitting Resources - (C) Proportional Allocation	-0.987	-0.866	-0.857	-0.892	-0.828	-0.894	-1.039	-1.020	-1.027	-1.029	-1.049	-1.075
II. Customer Credit from Emitting Resources - (D) Levelizing Allocation	-0.987	-0.786	-0.771	-0.829	-0.722	-0.832	-1.074	-1.041	-1.053	-1.057	-1.090	-1.133
III. Lower ZEC Prices	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IV. Lower REC Prices	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096
V. Increased TCC Value	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062
Subtotal (A)	**0.498**	**0.296**	**0.282**	**0.340**	**0.232**	**0.342**	**0.584**	**0.552**	**0.563**	**0.567**	**0.600**	**0.643**
Subtotal (B)	**0.498**	**0.240**	**0.267**	**0.298**	**0.297**	**0.346**	**0.599**	**0.586**	**0.594**	**0.596**	**0.605**	**0.653**
Subtotal (C)	**0.498**	**0.417**	**0.411**	**0.435**	**0.392**	**0.436**	**0.532**	**0.519**	**0.524**	**0.526**	**0.539**	**0.556**
Subtotal (D)	**0.498**	**0.498**	**0.498**	**0.498**	**0.498**	**0.498**	**0.498**	**0.498**	**0.498**	**0.498**	**0.498**	**0.498**
DYNAMIC ANALYSIS												
VI. Market Adjustments to Static Analysis - (A)	-0.115	-0.031	-0.031	-0.030	-0.019	-0.032	-0.058	-0.082	-0.089	-0.092	-0.207	-0.193
VI. Market Adjustments to Static Analysis - (B)	-0.115	-0.031	-0.030	-0.029	-0.012	-0.030	-0.057	-0.084	-0.091	-0.095	-0.208	-0.195
VI. Market Adjustments to Static Analysis - (C)	-0.112	-0.038	-0.038	-0.037	-0.015	-0.039	-0.064	-0.084	-0.091	-0.094	-0.189	-0.172
VI. Market Adjustments to Static Analysis - (D)	-0.110	-0.042	-0.042	-0.041	-0.013	-0.044	-0.069	-0.086	-0.092	-0.095	-0.177	-0.158
VII. Carbon Price-Induced Abatement (Avoided RECs)	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
Total Net Change in Customer Costs (A)	**0.379**	**0.261**	**0.246**	**0.306**	**0.210**	**0.306**	**0.523**	**0.466**	**0.471**	**0.471**	**0.390**	**0.446**
Total Net Change in Customer Costs (B)	**0.379**	**0.206**	**0.233**	**0.265**	**0.281**	**0.312**	**0.538**	**0.498**	**0.499**	**0.498**	**0.393**	**0.454**
Total Net Change in Customer Costs (C)	**0.382**	**0.376**	**0.370**	**0.395**	**0.373**	**0.393**	**0.464**	**0.431**	**0.430**	**0.428**	**0.346**	**0.380**
Total Net Change in Customer Costs (D)	**0.384**	**0.452**	**0.452**	**0.453**	**0.481**	**0.450**	**0.426**	**0.408**	**0.402**	**0.400**	**0.317**	**0.336**

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Allocation: Zonal Details, 2025

Customer Cost Impact of a $49/ton Carbon Charge, 2025
(cents/kWh)

	NYCA Average	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F	Zone G	Zone H	Zone I	Zone J	Zone K
STATIC ANALYSIS												
I. Static Increase in LBMPs	1.794	1.477	1.515	1.562	1.521	1.591	1.836	1.876	1.896	1.901	1.958	1.961
II. Customer Credit from Emitting Resources - (A) Load-Ratio Allocation	-1.061	-1.061	-1.061	-1.061	-1.061	-1.061	-1.061	-1.061	-1.061	-1.061	-1.061	-1.061
II. Customer Credit from Emitting Resources - (B) Proportional % Levelization	-1.061	-0.945	-0.963	-0.985	-0.958	-0.999	-1.038	-1.075	-1.087	-1.091	-1.137	-1.102
II. Customer Credit from Emitting Resources - (C) Proportional Allocation	-1.061	-0.885	-0.907	-0.934	-0.909	-0.957	-1.076	-1.100	-1.114	-1.117	-1.153	-1.156
II. Customer Credit from Emitting Resources - (D) Levelizing Allocation	-1.061	-0.764	-0.801	-0.847	-0.806	-0.885	-1.087	-1.127	-1.150	-1.156	-1.216	-1.221
III. Lower ZEC Prices	-0.243	-0.243	-0.243	-0.243	-0.243	-0.243	-0.243	-0.243	-0.243	-0.243	-0.243	-0.243
IV. Lower REC Prices	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250
V. Increased TCC Value	-0.058	-0.058	-0.058	-0.058	-0.058	-0.058	-0.058	-0.058	-0.058	-0.058	-0.058	-0.058
Subtotal (A)	**0.182**	**-0.134**	**-0.096**	**-0.049**	**-0.090**	**-0.020**	**0.225**	**0.265**	**0.285**	**0.290**	**0.347**	**0.349**
Subtotal (B)	**0.182**	**-0.019**	**0.002**	**0.026**	**0.012**	**0.041**	**0.248**	**0.251**	**0.258**	**0.260**	**0.271**	**0.308**
Subtotal (C)	**0.182**	**0.042**	**0.058**	**0.078**	**0.061**	**0.084**	**0.209**	**0.226**	**0.232**	**0.234**	**0.255**	**0.254**
Subtotal (D)	**0.182**	**0.162**	**0.164**	**0.165**	**0.164**	**0.155**	**0.198**	**0.199**	**0.195**	**0.195**	**0.192**	**0.189**
DYNAMIC ANALYSIS												
VI. Market Adjustments to Static Analysis - (A)	-0.103	0.064	0.060	0.057	0.057	0.090	-0.066	-0.263	-0.239	-0.239	-0.245	-0.079
VI. Market Adjustments to Static Analysis - (B)	-0.102	0.061	0.057	0.054	0.056	0.086	-0.070	-0.264	-0.240	-0.240	-0.234	-0.074
VI. Market Adjustments to Static Analysis - (C)	-0.101	0.060	0.055	0.052	0.056	0.085	-0.071	-0.264	-0.240	-0.240	-0.232	-0.066
VI. Market Adjustments to Static Analysis - (D)	-0.099	0.057	0.052	0.049	0.056	0.082	-0.075	-0.266	-0.241	-0.241	-0.223	-0.058
VII. Carbon Price-Induced Abatement (Avoided RECs)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Total Net Change in Customer Costs (A)	**0.077**	**-0.072**	**-0.038**	**0.005**	**-0.036**	**0.067**	**0.157**	**0.000**	**0.043**	**0.049**	**0.100**	**0.268**
Total Net Change in Customer Costs (B)	**0.079**	**0.040**	**0.056**	**0.078**	**0.066**	**0.126**	**0.176**	**-0.016**	**0.015**	**0.018**	**0.034**	**0.231**
Total Net Change in Customer Costs (C)	**0.079**	**0.099**	**0.111**	**0.128**	**0.115**	**0.167**	**0.136**	**-0.041**	**-0.011**	**-0.009**	**0.020**	**0.186**
Total Net Change in Customer Costs (D)	**0.081**	**0.217**	**0.214**	**0.212**	**0.218**	**0.235**	**0.121**	**-0.069**	**-0.048**	**-0.048**	**-0.034**	**0.129**

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Allocation: Zonal Details, 2030

Customer Cost Impact of a $45/ton Carbon Charge, 2030
(cents/kWh)

	NYCA Average	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F	Zone G	Zone H	Zone I	Zone J	Zone K
STATIC ANALYSIS												
I. Static Increase in LBMPs	1.575	1.301	1.379	1.412	1.359	1.418	1.608	1.641	1.660	1.665	1.709	1.677
II. Customer Credit from Emitting Resources - (A) Load-Ratio Allocation	-0.995	-0.995	-0.995	-0.995	-0.995	-0.995	-0.995	-0.995	-0.995	-0.995	-0.995	-0.995
II. Customer Credit from Emitting Resources - (B) Proportional % Levelization	-0.995	-0.846	-0.895	-0.912	-0.887	-0.918	-0.976	-1.017	-1.033	-1.037	-1.080	-1.033
II. Customer Credit from Emitting Resources - (C) Proportional Allocation	-0.995	-0.819	-0.865	-0.884	-0.852	-0.890	-1.012	-1.032	-1.047	-1.050	-1.084	-1.065
II. Customer Credit from Emitting Resources - (D) Levelizing Allocation	-0.995	-0.722	-0.794	-0.824	-0.773	-0.833	-1.021	-1.052	-1.075	-1.080	-1.133	-1.104
III. Lower ZEC Prices	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IV. Lower REC Prices	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347
V. Increased TCC Value	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033
Subtotal (A)	**0.200**	**-0.074**	**0.005**	**0.038**	**-0.016**	**0.044**	**0.234**	**0.266**	**0.285**	**0.290**	**0.334**	**0.302**
Subtotal (B)	**0.200**	**0.075**	**0.104**	**0.120**	**0.091**	**0.120**	**0.252**	**0.243**	**0.247**	**0.248**	**0.249**	**0.264**
Subtotal (C)	**0.200**	**0.102**	**0.134**	**0.148**	**0.127**	**0.148**	**0.216**	**0.229**	**0.233**	**0.235**	**0.245**	**0.232**
Subtotal (D)	**0.200**	**0.199**	**0.205**	**0.209**	**0.205**	**0.205**	**0.207**	**0.209**	**0.204**	**0.204**	**0.196**	**0.193**
DYNAMIC ANALYSIS												
VI. Market Adjustments to Static Analysis - (A)	-0.210	-0.121	-0.149	-0.162	-0.150	-0.147	-0.170	-0.347	-0.308	-0.307	-0.280	-0.123
VI. Market Adjustments to Static Analysis - (B)	-0.207	-0.125	-0.152	-0.166	-0.151	-0.151	-0.175	-0.349	-0.309	-0.308	-0.267	-0.119
VI. Market Adjustments to Static Analysis - (C)	-0.207	-0.125	-0.153	-0.167	-0.151	-0.152	-0.175	-0.349	-0.309	-0.307	-0.266	-0.114
VI. Market Adjustments to Static Analysis - (D)	-0.206	-0.128	-0.155	-0.169	-0.152	-0.155	-0.178	-0.350	-0.310	-0.308	-0.259	-0.108
VII. Carbon Price-Induced Abatement (Avoided RECs)	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018
Total Net Change in Customer Costs (A)	**-0.027**	**-0.213**	**-0.162**	**-0.142**	**-0.183**	**-0.122**	**0.045**	**-0.099**	**-0.041**	**-0.035**	**0.036**	**0.161**
Total Net Change in Customer Costs (B)	**-0.025**	**-0.068**	**-0.066**	**-0.064**	**-0.078**	**-0.050**	**0.059**	**-0.123**	**-0.080**	**-0.078**	**-0.036**	**0.127**
Total Net Change in Customer Costs (C)	**-0.025**	**-0.041**	**-0.037**	**-0.037**	**-0.042**	**-0.022**	**0.023**	**-0.138**	**-0.094**	**-0.091**	**-0.039**	**0.100**
Total Net Change in Customer Costs (D)	**-0.023**	**0.053**	**0.032**	**0.022**	**0.036**	**0.033**	**0.011**	**-0.159**	**-0.123**	**-0.122**	**-0.081**	**0.067**

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