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Secretary

Three Empire State Plaza, Albany, NY 12223-1350  
www.dps.ny.gov

October 18, 2016

Ms. Kathleen Burgess, Secretary  
New York State Public Service Commission  
Three Empire State Plaza  
Albany, NY 12223-1350

Re: Matter 16-00561 – In the Matter of the Clean Energy Advisory Council

Dear Secretary Burgess:

Enclosed please find the meeting materials for the October 20, 2016, Clean Energy Advisory Council (CEAC) Steering Committee meeting, to be held from 1:00 to 3:00 pm via webinar and teleconference. The webinar and conference call information are provided below.

The attached meeting materials include an Agenda; the September 19, 2016 draft meeting minutes; a revised CEAC Work Plan; draft revised Working Group Scopes for the Clean Energy Implementation & Coordination Working Group, the Metrics, Tracking & Performance Assessment Working Group, the Voluntary Investment & Other Market Development Working Group, the Low & Moderate Income Clean Energy Initiatives Working Group, and the REV Energy Efficiency Best Practices Working Group; and the Energy Efficiency Procurement & Markets Working Group's draft Energy Efficiency Target & Metrics Recommendations Report and accompanying PowerPoint presentation.

**WebEx and Conference Call Information:**

WebEx Event Address for Attendees:

<https://nyserda-events.webex.com/nyserda-events/onstage/g.php?MTID=e6e638b3491b71c847d4ebb9aa0d5a218>

Event Number: 664 292 420

Event Password: CEAC123

Audio Conference: 1-415-655-0001

Access Code: 664 292 420

Sincerely,

/s/

Christina Palmero  
Deputy Director of Clean Energy  
Office of Markets & Innovation

Enc.

**October 20, 2016**  
**Clean Energy Advisory Council**  
**Steering Committee Meeting**  
**1:00pm – 3:00pm**

**In-Person/Webinar/Teleconference**

**AGENDA**

The **agenda** for the meeting is attached and provided below.

- |   |              |
|---|--------------|
| 1. Roll Call  | (5 minutes)  |
| 2. Old Business   | (10 minutes) |
| a. September Meeting Minutes  |              |
| 3. Revised CEAC Work Plan and Work Scopes                             | (15 minutes) |
| a. CEAC Steering Committee Work Plan                                  |              |
| b. Clean Energy Implementation & Coordination Scope                   |              |
| c. Metrics, Tracking & Performance Assessment Scope                   |              |
| d. Voluntary Investment & Other Market Development Scope              |              |
| e. Low & Moderate Income Clean Energy Initiatives Scope               |              |
| f. REV Energy Efficiency Best Practices Scope                         |              |
| 4. Energy Efficiency Procurement & Markets Working Group              | (75 minutes) |
| a. Draft Energy Efficiency Targets and Metrics Recommendations Report |              |
| 5. Comments from the Public   | (15 minutes) |

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**WebEx and Conference Call Information**

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<https://nyserda-events.webex.com/nyserda-events/onstage/g.php?MTID=e6e638b3491b71c847d4ebb9aa0d5a218>

Event Number: 664 292 420

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Audio Conference: 1-415-655-0001

Access Code: 664 292 420

## Clean Energy Advisory Council (CEAC) Meeting Minutes

**Held on  
September 19, 2016  
1:00pm-3:00 pm**

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### Roll Call

The following organizations were represented on the Steering Committee:

New York State Department of Public Service  
New York State Energy Research and Development Authority  
AVANGRID, Inc. / Iberdrola  
Central Hudson Gas and Electric Corporation  
Consolidated Edison Company of New York, Inc.  
Long Island Power Authority  
National Fuel Gas Distribution Corporation  
National Grid USA Service Company, Inc.  
New York Power Authority  
Orange and Rockland Utilities, Inc.  
PSEG Long Island

Chris Corcoran, NYSEDA, Clean Energy Implementation & Coordination Working Group  
Tricia Cioni, Cascade Energy, Designee, Metrics, Tracking & Performance Assessment Working Group  
Mark Lorentzen, TRC Solutions, Designee, Voluntary Investment & Other Market Development Working Group  
Adam Flint, Binghamton Regional Sustainability Coalition, Designee, Low & Moderate Income Clean Energy Initiatives Working Group  
Liz Weiner, CLEAResult, Energy Efficiency Procurement & Markets Working Group  
Frank Murray, NRDC, Designee, REV Energy Efficiency Best Practices Working Group

### Old Business

#### *August Meeting Minutes*

The meeting minutes of the August 17, 2016 meeting were approved by the Steering Committee, with one correction to attribution of a particular comment.

#### *Chair Update*

Colleen Gerwitz welcomed everyone to the meeting and thanked them for their attentiveness with regard to time extensions addressed since the previous Steering Committee meeting and for the development of the Working Group flow charts. With regard to the flow charts, she characterized these as “works-in-progress” as dates will change and phased approaches to work products will likely develop. Ms. Gerwitz also suggested that the overall approach for the completion of identified Working Group tasks should be to undertake and complete what is currently possible, to consider phased work products, and to develop new or more appropriate work products.

Mr. Margalit stressed the need to be aware of the interdependencies between Working Groups in the development of work products and to focus effort on activities where the resultant work products are truly value-added.

### **Clean Energy Implementation & Coordination Working Group**

Chris Corcoran, NYSERDA, reported that this Working Group had a very busy month appreciated the beneficial feedback on the Multiple Incentive Report and the Incentive Inventory. He reported that the Final Report was filed on September 13, 2016. With regard to the Utility/NYSERDA Coordination Report, Mr. Corcoran reported that he anticipates a draft outline to be completed in time for the next Steering Committee meeting, which will be offered for public comment. Mr. Corcoran further reported that changes to the Work Plan were minor and did not affect any deliverable final due dates.

In response to an inquiry by Ms. Cioni, Cascade Energy, about how the Working Group perceives evaluation issues, Mr. Corcoran agreed that this is a core question and acknowledged that the Working Group recognizes that evaluation issues will require additional coordination over the next several months.

Mr. Margalit stated that he finds the Working Group work products to be very solid and NYSERDA would be grateful for additional utility insight about how NYSERDA and the utilities can better complement each other in moving their respective work forward.

In response to inquiries from Mr. Campagiorni, Central Hudson, regarding whether there are designated utility point persons for each company and how programmatic collaboration between NYSERDA and the utilities will improve from the past, Mr. Margalit stressed that NYSERDA has no prescriptive approach that fits all utilities, but will fit its model to work best with utilities of different sizes, needs, and staff capacity. He identified Kevin Hale, NYSERDA, as the liaison from NYSERDA who will assist in these efforts, and also asked that anyone on the Steering Committee also reach out directly to himself when presented with opportunities or obstacles. Mr. Margalit further stated an interest in engaging at both the program development stage as well as at the point of program deployment. He stated that an overall goal is to engage and to avoid a recurrence of past barriers by tackling issues directly.

In response to an inquiry by Ms. Cioni regarding the status of a central database effort, Mr. Corcoran stated that the current plan is to maintain the designed spreadsheet and use it as a coordination tool. The Working Group has determined that a database effort does not make sense at this time. However, a set schedule to update and maintain the spreadsheet tool will be developed so that the tool remains useful.

### **Metrics, Tracking & Performance Assessment Working Group**

Tricia Cioni, Cascade Energy, reported that the Evaluation Guidelines Recommendation Report should be submitted to the Department of Public Service within the next month, as it was provided for Steering Committee review on September 9, 2016. She identified many areas of suggestion including advanced measurement and verification (M&V), capturing market transformation efforts, and the timeliness of evaluation reports. Ms. Cioni also stated that the Working Group is maintaining a log of areas where the input and suggestions disagree. In a companion effort, Ms. Cioni reported that the Working Group is also developing sections of draft text to be considered by the Department of Public Service Staff when updating the guidelines.

With regard to the specifics of the Evaluation Guidelines Recommendation Report, Ms. Cioni provided more details of the approach taken by the Working Group in the review of the old and the development of the new text. The Working Group has determined that much of the old language remains applicable but the new version, including the appendices, will be edited, summarized, and supplemented to capture differences in emphasis and new approaches. Ms. Cioni suggested that the topic of advanced M&V should be part of every Working Group's thought process as new programs are developed.

In response to agreement by the Steering Committee to a request by the Working Group to phase the work of the Evaluation, Measurement and Verification Coordination Plan and change the due date to accommodate feedback from the Clean Energy Implementation & Coordination Working Group, Mr. Sobolewski, National Grid, agreed that while the approach seems rational, Working Groups should ensure that there is a clear understanding of the content of any work product that a team is awaiting so that expectations are clearly aligned and no time is lost due to a misunderstanding.

In response to an inquiry by Mr. Beaudoin, AVANGRID, Peggie Neville, NYS Department of Public Service, clarified that the actual guidelines will be issued by NYS Department of Public Service Staff.

Mr. Margalit stressed that the goal is to measure what is possible now, while being receptive to the development of new tools in the future that would be designed to measure greater impacts.

Describing this as a massive effort, Ms. Gerwitz cautioned that the Working Group should remain focused on energy efficiency as a first priority, as there is plenty of scope in that area, while adjusting to new program designs and market transformation approaches. She also advised staying focused on outcome metrics rather than a megawatt, or "bottom up", approach.

Mr. Sobolewski stated that a tension still exists with some of the work streams with managing the "bottom up" versus "top down" approach; in that it may not be advisable to end up with both approaches as that situation would not be easily managed. He added that issues still surround the importance of the rapidly evolving area of customer data and what is required to get it right. Ms. Gerwitz added that it is recognized that the issue of customer data underlies many activities, even those beyond the scope of the Clean Energy Advisory Council, and an approach is needed that protects the parties' interests while encouraging progress.

Mr. Beaudoin, AVANGRID, added that the issue also comes up within the context of the Community Choice Aggregation efforts in attempting to distinguish a "value" service from "basic" service and that this issue is being addressed in separate proceedings, rather than generically. With that, Ms. Gerwitz agreed that this overall issue will likely be addressed in other forums. A similar exchange was had with regard to the issues of information technology and data issues.

With regard to the Performance Metrics outline, the Working Group recommendation is to phase the work so that the January 25, 2017 deliverable can be met and also as the work slated for phase two is more closely tied to the work products of other Working Groups which are in various stages of development. Mr. Margalit agreed that the staging approach makes sense. Ms. Gerwitz added that a date for the phase two work will need to be determined as other items progress.

### **Voluntary Investment & Other Market Development Working Group**

Mark Lorentzen, TRC Solutions, began the discussion by stating that the Working Group has been productive but that the suggested approach to a final work product has been reconsidered by the Group in an attempt to address the assigned issues in a more concrete and actionable way. The new approach would focus more heavily on an approach that could lead to the identification of demonstration projects.

John Williams, NYSEERDA, further explained that the point of the new approach is to allow for tangible activity, beyond research, in an effort to further support future approaches to program design through learned experience from demonstration efforts. He stated that encouraging voluntary investments involves identifying those activities that have the ability to stand on their own, have a viable rate of return, and make good business opportunities.

Overall, the Working Group is suggesting pivoting the work product to a platform that demonstrates viable voluntary investment outcomes. In doing so, the Working Group would submit the parameters for a successful approach to the Steering Committee. Design and launch of a program approach, with appropriate Steering Committee partners, could lead to a second phase of the program, with any necessary Commission direction. More specifically, Mr. Williams suggested that the approach would: (1) build demonstration or pilot project parameters that would identify project elements that would be more likely to elicit voluntary investment (or, “additionality”); (2) identify market segments toward program design that would build upon, or elicit additions to, investments beyond the public benefits program; (3) repurpose the Working Group report work product so that it builds on the early learning of some of the efforts underway (self-direct, NYGATS, NY Prize, etc. ) under an extended timeframe; and (4) by engaging with additional external expertise, focus specifically on output that addresses Community Choice Aggregation.

Mr. Campagiorni, Central Hudson, in stating that he understands the Working Group’s quandary in that many of the aforementioned activities are nascent, questioned the usefulness of undertaking the suggested approach so early on and the likelihood of results.

Using NY Prize as an example, Mr. Williams explained that if such an effort can show system-based attractiveness, a fuller understanding as to whether those types of efforts should focus on certain customer classes might result. Using Community Choice Aggregation as an example, Mr. Williams explained that there is an opportunity for better education across all sectors which could benefit from a demonstration approach with a goal of gaining a broader audience to test the market. He offered that the Working Group could continue to pull together a report as originally intended, but is instead suggesting a pilot plan document in the same timeframe with design and launch to follow a few months later.

Mr. Ketschke, Consolidated Edison, expressing concerns, stated that he found the new approach to be overly ambitious and a markedly different approach than what was originally intended. Mr. Sobolewski, National Grid, stated that he shares the same concerns. He added that it is unclear what the status of gap identification is, but he is hopeful that there will be learnings from other ongoing customer-oriented activities over the next few months.

In response to a discussion of issues regarding the identification of points of value, the monetization of value streams, driving market investments, and identifying gaps raised by Mr. Ketschke and Mr. Sobolewski, Mr. Williams stated that it would be difficult for the Working Group to step into that space and questioned the fruitfulness. He offered that the Working Group has found that many of the gaps have

been sufficiently identified, particularly through observing efforts in other jurisdictions. Rather, the Working Group was suggesting an approach that would attempt to determine some solid “proof points”.

Ms. Gerwitz inquired as to whether there would be value in testing a few of the theories posed by Mr. Ketschke in an attempt to make them actionable. Mr. Ketschke believes that there is too much involved to be successful in such an endeavor and stated that the Working Group should remain focused on the research that would provide insight into what types of activities would work and why.

Mr. Margalit suggested that, perhaps bridging the gap, by establishing criteria for what good programmatic outcomes and criteria for demonstrations might look like would be a reasonable first step approach. Mr. Ketschke felt this was a more reasonable approach. Ms. Gerwitz also suggested sharing a work scope prior to the next scheduled Steering Committee meeting.

### **Low & Moderate Income Clean Energy Initiatives Working Group**

Adam Flint, Binghamton Regional Sustainability Coalition, reported that the Working Group is compiling information with the goal of developing recommendations for alternative approaches for serving the low-to-moderate income sector. Mr. Flint reported that the Working Group has engaged in lengthy conversations regarding the special nature of that market segment, the possibility of market-based approaches, as well as other alternatives if market-based options do not materialize. The Working Group is also engaging focus groups to assist in these efforts.

Mr. Flint stated that there is an update on the Work Plan and the due date for providing the first draft of the Report on Alternative Approaches, slated to be completed by September 26, 2016 and now extended to October 5, 2016, to allow the subgroups additional time to develop their initial sets of recommendations. Members of the Working Group have also met with the Chairs of the Energy Efficiency Best Practices Working Group. As a result of that meeting, it was decided that the LMI Working Group will take on the best practices effort for this sector. The Working Group also plans to meet with other Working Group chairs to identify interdependencies and opportunities for coordinating other work.

In response to Mr. Beaudoin’s, AVANGRID, inquiry as to whether the information on the locations of the focus groups would be shared, Mr. Flint stated that, subject to check, he was confident that the information would be made available.

Ms. Gerwitz reinforced that ideas to be sought include changes that can be made to supplement efforts for this customer sector, as well as the identification of new efforts. Ms. Gerwitz suggested that the guiding questions be: what can better be brought to bear in this space, and what is worth investing in for this particular customer sector? Mr. Flint agreed, stating that is reflective of the plan for the work product.

### **Energy Efficiency Procurement & Markets Working Group**

Liz Weiner, CLEARResult, reported that with regard to the first Work Stream of an Energy Efficiency Targets and Metrics Recommendations Report, the Working Group continues to assess the issue of outcome-oriented and intensity-based metrics for use in scorecards. The issue is complex, partially due to definitional issues such as defining “good” load, back-casting, calculating net changes in electric usage across service territories or sectors over time, and the fact that this analysis spans program, policy, and

market activities. Ms. Weiner emphasized that the considered approach is markedly different from the traditional “program by program” or “measure by measure” approach of the past and the Working Group is mindful that utilities should not be penalized for new “good” load or the implementation of building code requirements. In order to more fully understand the implications and implementation consequence of this different approach, the Working Group has also requested additional analysis stemming from the 2014 *NYSERDA Energy Efficiency Potential Study* to more specifically address individual utility service territories.

With regard to the second Work Stream of an Energy Efficiency Market Procurement Recommendations Report, it was reported that the Working Group is investigating alternative approaches to procurement, as well as options for monetizing the value of energy efficiency, perhaps resulting in cash flows for securitization in a secondary market.

Reference was made to a recent filing by the Joint Utilities that addresses the treatment of energy efficiency in the short term and the challenge of rectifying a short-term approach with the longer-term aspirations of a market transformation approach. In this vein, Ms. Gerwitz inquired as to whether the Working Group has considered a two-tiered approach, keeping individual targets along with a broader, system-wide top down target. Ms. Weiner responded that this issue has in fact surfaced a few times in the Working Group discussions and the Working Group is of two minds – with some, but not unanimous, support for a hybrid approach. The Working Group is mindful that the NYS Public Service Commission issued a directive to develop an outcome-oriented metric and the Working Group’s charge is to characterize what the path might look like. The Working Group is hoping to encourage progress toward that charge while also recognizing the utilities’ concerns that it is not necessarily an end state that can be achieved in the very short term. Applauding the Working Group’s efforts, Ms. Gerwitz encouraged it to continue to focus on that ultimate outcome, identify the next steps, and bring back the best possible plan. She also suggested that at some point in the future, the merging of the efforts of the Metrics, Tracking & Performance Assessment with those of Energy Efficiency Procurement & Markets Working Group for this issue may prove beneficial.

Vanessa Ulmer, NYSERDA, offered additional clarity on the Working Group’s approach to addressing the energy efficiency metrics and targets and the implications on the level of confidence that a particular metric might capture. Ms. Ulmer added that positive-only incentives are being discussed and that the Working Group is mindful that the integrity of an outcome-oriented metric is very dependent upon the ultimate definition used (for example, posing the question about whether it is truly an outcome-based metric if the ultimate definition is just a little more than planned program results).

In response to an inquiry by Ms. Gerwitz about how best to move forward on these critical issues, it was suggested that a follow-up call be scheduled within the next two weeks between the team members and utility representatives, given the level of importance of these issues and the potential for unintended consequences.

### **REV Energy Efficiency Best Practices**

Frank Murray, NRDC, reported that there were no significant revisions to the Working Group work scope but that a meeting scheduled for September 30, 2016 will focus heavily on upcoming work products. He addressed progress on two work streams. The first Work Stream is related to the identification of potential energy efficiency best practices (programs and policies) and the Working Group should be able

to provide an initial screening of best practices and recommendations to go forward by the next Steering Committee meeting, if not sooner. He added that additional work may need to be done in the areas of workforce education and financing.

With regard to the second Work Stream which is to identify the appropriate platform or resource tools to maintain and disseminate information on best practices, Mr. Murray stated that the Working Group is soliciting input from the Steering Committee, other organizations, and particularly the utility representatives, as to what might make for richer and deeper participation. The goal of this effort is to make the information available to be most useful for the utilities and the distributed energy resource providers. To most effectively achieve that goal, the Working Group seeks more guidance on how to provide products of value. Mr. Murray identified three potential means of conveying the best practices information that are under consideration: 1) periodic reports; 2) White Papers; or 3) a formal web site, preferably maintained by a third party. Overall, the Working Group would like to ensure that the mechanism best responds to the needs of customers.

Ms. Gerwitz suggested that certain best practices may need different mechanisms for sharing, as one mechanism may not necessarily serve all in the best manner possible.

#### **Other Business**

Ms. Gerwitz reminded Steering Committee Members to be aware of forthcoming extensions and schedule changes that will be addressed. She also mentioned that upon the issuance of the 2017 schedule for New York State Public Service Commission schedules, Steering Committee Members would be polled in order to determine the 2017 CEAC Steering Committee meeting dates.

#### **Public Comments**

There being no other business to discuss and no comments from the public, the meeting was adjourned.

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*Clean Energy Advisory Council Work Plan*

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The following is the revised Clean Energy Advisory Council (CEAC or the Council) Work Plan, which sets forth the schedule for Council and Council Working Group deliverables.

**Background:**

By order issued January 21, 2016 (January CEF Order),<sup>1</sup> the New York Public Service Commission (the Commission) established the Clean Energy Advisory Council. The Commission stated that the Council’s “primary objective is to support innovation and collaboration for an effective transition from current program offerings to post-2015 clean energy activities and on-going delivery thereafter.” The Commission directed the Council to, on an annual basis, develop a work plan identifying key areas of focus, the priorities among and within each area of focus, as well as corresponding work products and associated timelines. Currently, this Work Plan reflects those areas of focus and work products identified by the Commission in the January CEF Order and the January 22, 2016 Utility Energy Efficiency Order.<sup>2</sup> In addition to Commission directed activities, future iterations of the Council’s Work Plan may include areas of examination raised by individual Council members or Working Groups and agreed to by the Council.

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<sup>1</sup> Case 14-M-0094 et al, Proceeding on Motion of the Commission to Consider a Clean Energy Fund, Order Authorizing the Clean Energy Fund Framework (issued January 21, 2016).

<sup>2</sup> Case 15-M-0252, In the Matter of Utility Energy Efficiency Programs, Order Authorizing Utility-Administered Energy Efficiency Portfolio Budgets and Targets for 2016 – 2018 (issued January 22, 2016).

Schedule:

TASK	RESPONSIBLE	Date	OCTOBER					NOVEMBER				DECEMBER				JANUARY				FEBRUARY				MARCH	Q2	Q3	Q4		
			3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27					
Steering Committee Meeting Dates					20		3					30		13					10				7			TBD	TBD	TBD	TBD
<b>CLEAN ENERGY IMPLEMENTATION &amp; COORDINATION WORKING GROUP (CEIC WG)</b>																													
Outline of Utility/NYSERDA Coordination Report Due	CEIC WG	10/27/16				27																							
Feedback on Utility/NYSERDA Coordination Report Outline	Steering Committee	10/20/16					X																						
Draft Utility/NYSERDA Coordination Report Due	CEIC WG	12/2/16									2																		
Feedback on Draft Utility/NYSERDA Coordination Report	Steering Committee	12/13/16											X																
<i>Final Utility/NYSERDA Coordination Report Filed</i>	CEIC WG	1/17/17																	17										
<b>METRICS, TRACKING, &amp; PERFORMANCE ASSESSMENT WORKING GROUP (MTPA WG)</b>																													
Outline of Evaluation Guidelines Recommendations Due	MTPA WG	8/10/16																											
Feedback on Evaluation Guidelines Recommendation Outline	Steering Committee	8/17/16																											
Draft Evaluation Guidelines Recommendations Report Due	MTPA WG	9/9/16																											
Feedback on Draft Evaluation Guidelines Recommendation Report	Steering Committee	9/19/16																											
<i>Final Evaluation Guidelines Recommendations Report Filed</i>	MTPA WG	10/3/16	3																										
<b>REVISED EVALUATION GUIDELINES FILED</b>	<b>DPS</b>	<b>11/1/16</b>					1																						
Outline of EM&V Coordination Plan Due	MTPA WG	Q2 2017																											
Feedback on EM&V Coordination Plan Outline	Steering Committee	Q2 2017																									TBD		
Draft EM&V Coordination Plan Due	MTPA WG	Q4 2017																											
Feedback on Draft EM&V Coordination Plan	Steering Committee	Q4 2017																											TBD
<i>Final EM&amp;V Coordination Plan Filed</i>	MTPA WG	Q4 2017																											
Outline of Performance Metrics Phase 1 Recommendations Report Due	MTPA WG	9/9/16																											
Feedback on Performance Metrics Phase 1 Recommendations Report Outline	Steering Committee	9/19/16																											
Draft Performance Metrics Phase 1 Recommendations Report Due	MTPA WG	12/23/16																											
Feedback on Draft Performance Metrics Phase 1 Recommendations Report	Steering Committee	1/10/17																		X									
<i>Final Performance Metrics Phase 1 Recommendations Report Filed</i>	MTPA WG	1/25/17																											
<b>Outline of Performance Metrics Phase 2 Report Due</b>	<b>MTPA WG</b>	<b>Q1 2017</b>																											
<b>Feedback on Performance Metrics Phase 2 Report Outline</b>	<b>Steering Committee</b>	<b>Q1 2017</b>																											TBD
<b>Draft Performance Metrics Phase 2 Report Due</b>	<b>MTPA WG</b>	<b>Q3 2017</b>																											
<b>Feedback on Draft Performance Metrics Phase 2 Report</b>	<b>Steering Committee</b>	<b>Q3 2017</b>																											TBD
<i>Final Performance Metrics Phase 2 Report Filed</i>	MTPA WG	Q3 2017																											
Outline of Online Dashboard Recommendations Report Due	MTPA WG	11/17/16																											
Feedback on Online Dashboard Recommendations Report Outline	Steering Committee	11/30/16																											
Draft Online Dashboard Recommendations Report Due	MTPA WG	1/26/17																											
Feedback on Draft Online Dashboard Recommendations Report	Steering Committee	2/7/17																											X
<i>Final Online Dashboard Recommendations Report Filed</i>	MTPA WG	2/23/17																											

Clean Energy Advisory Council

TASK	RESPONSIBLE	Date	OCTOBER					NOVEMBER				DECEMBER				JANUARY					FEBRUARY			MARCH	Q2	Q3	Q4
			3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27			
Steering Committee Meeting Dates					20		3					30		13			10				7			TBD	TBD	TBD	TBD
<b>VOLUNTARY INVESTMENT AND OTHER MARKET DEVELOPMENT WORKING GROUP (VI WG)</b>																											
Draft Voluntary Investment Demonstration Parameters Report Due	VI WG	11/23/16								23																	
Feedback on Draft Voluntary Investment Demonstration Parameters Report	Steering Committee	11/30/16								X																	
Final Voluntary Investment Demonstration Parameters Report Filed	VI WG	12/21/16											21														
<b>VOLUNTARY INVESTMENT PROPOSAL FILED</b>																											
Outline of Community Choice Aggregation Recommendations Report Due	VI WG	Q2 2017																									
Feedback on Community Choice Aggregation Recommendations Report Outline	Steering Committee	Q2 2017																							TBD		
Draft Community Choice Aggregation Recommendations Report Due	VI WG	Q3 2017																									
Feedback on Draft Community Choice Aggregation Recommendations Report	Steering Committee	Q3 2017																								TBD	
Final Voluntary Investment Recommendations Report Filed	VI WG	Q3 2017																									
Outline of Voluntary Investment Recommendations Report Due	VI WG	Q2 2017																									
Feedback on Voluntary Investment Recommendations Report Outline	Steering Committee	Q2 2017																							TBD		
Draft Voluntary Investment Recommendations Report Due	VI WG	Q3 2017																									
Feedback on Draft Voluntary Investment Recommendations Report	Steering Committee	Q3 2017																									TBD
Final Voluntary Investment Recommendations Report Filed	VI WG	Q3 2017																									
<b>LOW &amp; MODERATE INCOME CLEAN ENERGY INITIATIVES WORKING GROUP (LMI WG)</b>																											
Outline of Alternative Approaches to LMI EE Services Report Due	LMI WG	8/10/16																									
Feedback on Alternative Approaches to LMI EE Services Report Outline	Steering Committee	8/17/16																									
Draft Alternative Approaches to LMI EE Services Report Due	LMI WG	12/2/16								2																	
Feedback on Draft Alternative Approaches to LMI EE Services Report	Steering Committee	12/13/16											X														
Final Alternative Approaches to LMI EE Services Report Filed	LMI WG	1/17/17														17											
<b>ENERGY EFFICIENCY PROCUREMENT &amp; MARKETS WORKING GROUP (EPPM WG)</b>																											
Outline of EE Targets and Metrics Recommendations Report Due	EPPM WG	8/10/16																									
Feedback on EE Targets and Metrics Recommendations Report Outline	Steering Committee	8/17/16																									
Draft EE Targets and Metrics Recommendations Report Due	EPPM WG	10/11/16			11																						
Feedback on Draft EE Targets and Metrics Recommendations Report	Steering Committee	10/20/16			X																						
FINAL EE TARGETS AND METRICS RECOMMENDATIONS FILED	EPPM WG	11/4/16					4																				
Outline of EE Market Procurement Recommendations Report Due	EPPM WG	10/26/16				26																					
Feedback on EE Market Procurement Recommendations Report Outline	Steering Committee	11/3/16					X																				
Draft EE Market Procurement Recommendations Report Due	EPPM WG	12/22/16											22														
Feedback on Draft EE Market Procurement Recommendations Report	Steering Committee	1/10/17													X												
Final EE Market Procurement Recommendations Report Filed	EPPM WG	1/25/17														25											
<b>REV ENERGY EFFICIENCY BEST PRACTICES WORKING GROUP (REV/EE WG)</b>																											
Outline of REV EE Best Practices Guide Due	REV/EE WG	10/27/16				27																					
Feedback on REV EE Best Practices Guide Outline	Steering Committee	11/3/16					X																				
Draft REV EE Best Practices Guide Due	REV/EE WG	1/24/17														24											
Feedback on Draft REV EE Best Practices Guide	Steering Committee	2/7/17																			X						
Final REV EE Best Practices Guide Filed (For 5/2017 ETIP)	REV/EE WG	2/21/17																					21				
<b>KEY:</b>																											
Steering Committee Conference Call																											
In-Person Steering Committee Meeting																											
Filing in DMM (non-Ordered due dates)																											
ORDERED FILING																											
X = Item being discussed at Steering Committee Call/Meeting																											
Deliverable Due Date																											

## Clean Energy Advisory Council

### Revision/Addition Process:

At a minimum, the Council's Work Plan will be revised annually. In addition, in instances where a Working Group determines that it will be unable to meet the dates reflected in the Council's Work Plan, the Working Group, through its Steering Committee Designee, may submit a request, including a proposed revised timeline, to the Council's Steering Committee to extend the due date. Once approved by the Steering Committee, the revised timeline will be incorporated into the Work Plan. In addition, the Work Plan will be revised to reflect the timelines associated with new efforts required by the Commission, assigned by the Steering Committee, or proposed by a Working Group and agreed to by the Steering Committee.

The Work Plan and all subsequent revisions will be filed in Matter 16-00561, In the Matter of the Clean Energy Advisory Council.

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## *Clean Energy Implementation & Coordination Working Group Scope*

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### *Purpose:*

The purpose of the Clean Energy Implementation and Coordination Working Group is to coordinate planning and implementation among New York's clean energy program administrators, in consultation with DPS Staff to better support New York's clean energy policy objectives, provide clarity to the market, and serve ratepayers.

### *Guiding Principles & Clean Energy Advisory Council (CEAC) Protocols:*

Working Group activities in support of feasible and impactful findings are expected to include:

- Conducting and implementing Working Group activities with transparency and openness;
- Planning and implementing a work agenda and schedule of activities in support of the Working Group objectives;
- Compiling research;
- Directing analysis and studies;
- Soliciting expert advice;
- Developing options and proposals for consideration with particular focus and emphasis on implications and benefits to customers;
- Assessing options and proposals against objectives, and arriving at written feasible recommendations that provide the underlying rationale and, as needed, documents dissenting views along with associated rationale;
- Informing the development and implementation of programs among New York's clean energy program administrators;
- Providing regular written updates on the Working Group's activities and progress; and
- Sharing final work products and notable interim work products.

Protocols regarding CEAC Steering Committee and Working Group interactions include:

- Working Group scopes are authorized by the Steering Committee. Working Groups may at any time propose revisions and additions to the Working Group scopes for Steering Committee consideration but the initial objectives and deliverables of each group will focus on Commission assigned activities. The Steering Committee will guide and authorize Working Group scopes that lead to recommendations that help inform the future development of programs.
- Each Working Group will establish its own work plan and schedule and should incorporate opportunities for non-member input and feedback, as appropriate and feasible and shall provide routine updates to the Steering Committee on its progress. The Steering Committee will identify potential overlap and coordination between Working Group activities and will suggest opportunities for integration or sharing resources between and among Working Group activities.

- Working Group reports and other documents will typically be provided to the Steering Committee for review and comment two to three weeks prior to final deliverable due dates. The Steering Committee will review and assess Working Group products against the overall objectives and purpose of the Clean Energy Advisory Council and Working Groups. The Working Group shall consider Steering Committee comments and shall document whether it has incorporated or rejected each comment with associated rationale in a new section of the report or in an appendix to the report. The Working Group retains ownership of final work products and is under no obligation to revise its recommendations in response to Steering Committee feedback. The Working Group shall work with Staff to ensure all final work products are filed in DMM and posted to the DPS website.

### *Initial Objectives:*

The Clean Energy Implementation and Coordination Working Group is initially tasked with:

- (1) E<sup>2</sup> Working Group Transition – Conduct an orderly transition and completion of any outstanding tasks of the E<sup>2</sup> Working Group and ensure any relevant needs, previously met by the E<sup>2</sup> Working Group, are accounted for in the operation of the CEAC. Specifically, the Working Group shall inventory any remaining tasks and associated deliverables and identify timelines for completion or transition of select tasks to appropriate Clean Energy Advisory Council Working Groups, if appropriate.
- (2) Recommendations Regarding Multiple Incentives – Undertake a review designed to identify overlapping incentives and market development activities from various funding streams, to eliminate wasteful duplication and leverage complementary efforts. Specifically, the Working Group shall inventory or otherwise gather program, funding source and incentive information about the various program administrator clean energy programs and initiatives, including but not limited to utility, NYSERDA, NYPA and LIPA/PSEG clean energy programs and initiatives, demand response and load management programs, and REV demonstration and non-wires alternative projects to identify overlapping or duplicative programs or initiatives and current instances of multiple incentives from various funding streams. It shall develop recommendations for Staff guidance including the identification of tests to determine where layered incentives would be appropriate and where they should be forbidden as well as processes for sharing of information to determine when the tests should be applied.
- (3) Utility / NYSERDA Coordination – Provide recommendations for using the CEAC as a venue for planning and collaboration among program administrators that supports effective development and deployment of program offerings and initiatives.
- (4) Recommendation Regarding Continuation of Working Group Activities – Determination as to whether the Working Group has fulfilled its purpose upon the completion of the initial objectives or recommended additional objectives and tasks for the Working Group to pursue.

*Tasks/Deliverables:*

Task/Deliverable	Expected Completion Date
Final Clean Energy Implementation & Coordination Work Scope, including member list and member roles provided to Steering Committee <ul style="list-style-type: none"> <li>• Provide to DPS Staff</li> <li>• Final Filed in DMM</li> </ul>	5/25/16 6/17/16
Initial detailed Clean Energy Implementation & Coordination Work Plan <ul style="list-style-type: none"> <li>• Draft submitted to CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	6/9/16 8/1/16
E <sup>2</sup> Working Group Transition Recommendations Report, including an inventory of remaining E <sup>2</sup> Working Group tasks, recommendations and schedule submitted to CEAC Steering Committee <ul style="list-style-type: none"> <li>• Draft Submitted to CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	7/1/16 7/29/16
Multiple Incentives Report detailing recommendations for treatment of multiple incentives submitted to the CEAC Steering Committee <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul> <p><i>Note: The 1/21/2016 CEF Framework Order in Case 14-M-0094 directed Staff to file a guidance that identifies tests to determine where layered incentives would be appropriate, as well as processes for sharing information to determine when these tests should be run by October 3, 2016.</i></p>	7/6/16 8/8/16 9/6/16
Utility / NYSERDA Coordination Report providing recommendations and a plan for using the CEAC venue as means for facilitating greater collaboration and coordination regarding programs and initiatives. <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	10/ <del>4</del> 27/16 12/2/16 1/ <del>9</del> 17/17
Provide a Recommendation to the Steering Committee as to whether the Working Group has completed its purpose and should be folded or provide a revised Working Group Scope with additional objectives, tasks and deliverables.	At any time, but no later than 90 days following the completion of previously assigned deliverables

*Members<sup>1</sup>:*

<b>Name</b>	<b>Role</b>	<b>Company/Organization</b>	<b>Email</b>
Jesse Feinberg	Co-Chair <sup>2</sup>	Con Edison	<a href="mailto:feinbergj@coned.com">feinbergj@coned.com</a>
Chris Corcoran	Co-Chair <sup>2</sup>	NYSERDA	<a href="mailto:chris.corcoran@nyserda.ny.gov">chris.corcoran@nyserda.ny.gov</a>
Gayle Pensabene	Secretary	National Grid	<a href="mailto:gayle.pensabene@nationalgrid.com">gayle.pensabene@nationalgrid.com</a>
Amanda Sucato	Member	Central Hudson	<a href="mailto:asucato@cenhud.com">asucato@cenhud.com</a>
Katie Mammen	Member	DPS	<a href="mailto:kathryn.mammen@dps.ny.gov">kathryn.mammen@dps.ny.gov</a>
Michael Deering	Member	LIPA	<a href="mailto:mdeering@lipower.org">mdeering@lipower.org</a>
Erik Solomon	Member	NFG	<a href="mailto:solomone@natfuel.com">solomone@natfuel.com</a>
Amber Sisson	Member	NYPA	<a href="mailto:amber.sisson@nypa.gov">amber.sisson@nypa.gov</a>
Dave Gridley	Member	NYSEG/RG&E	<a href="mailto:dgridley@nyseg.com">dgridley@nyseg.com</a>
Charmaine Cigliano	Member	O&R	<a href="mailto:ciglianoc@oru.com">ciglianoc@oru.com</a>
Dan Zaweski	Member	PSEG LI	<a href="mailto:daniel.zaweski@pseg.com">daniel.zaweski@pseg.com</a>

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<sup>1</sup> Due to the nature of the work of this Working Group, membership is limited to DPS, NYSERDA, the Utilities, NYPA, LIPA and PSEG. However, the Working Group will reach out to stakeholders and topical experts on an as needed basis to inform discussions

<sup>2</sup> This Working Group will not include a Steering Committee Designee, instead one of the Co-Chairs will attend Steering Committee Meetings and provide monthly progress reports to the Steering Committee on behalf of the Working Group.

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## *Metrics, Tracking & Performance Assessment Working Group Scope*

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### *Purpose:*

The overall purpose of the Metrics, Tracking & Performance Assessment Working Group is to develop recommendations for a consistent approach to metrics, data tracking, and performance assessment, inclusive of evaluation, measurement & verification (EM&V) that looks to advances in technology and approaches to reduce and limit the dollars needed for these functions while maintaining needed reliability, thereby increasing the dollars available for program delivery. The Working Group will also identify and recommend metrics and approaches for evaluating market development and transformation.

### *Guiding Principles & Clean Energy Advisory Council (CEAC) Protocols:*

Working Group activities in support of feasible and impactful findings are expected to include:

- Conducting and implementing Working Group activities with transparency and openness;
- Planning and implementing a work agenda and schedule of activities in support of the Working Group objectives;
- Compiling research;
- Directing analysis and studies;
- Soliciting expert advice;
- Developing options and proposals for consideration with particular focus and emphasis on implications and benefits to customers;
- Assessing options and proposals against objectives, and arriving at written feasible recommendations that provide the underlying rationale and, as needed, documents dissenting views along with associated rationale;
- Informing the development and implementation of programs among New York's clean energy program administrators;
- Providing regular written updates on the Working Group's activities and progress; and
- Sharing final work products and notable interim work products.

Protocols regarding CEAC Steering Committee and Working Group interactions include:

- Working Group scopes are authorized by the Steering Committee. Working Groups may at any time propose revisions and additions to the Working Group scopes for Steering Committee consideration but the initial objectives and deliverables of each group will focus on Commission assigned activities. The Steering Committee will guide and authorize Working Group scopes that lead to recommendations that help inform the future development of programs.
- Each Working Group will establish its own work plan and schedule and should incorporate opportunities for non-member input and feedback, as appropriate and feasible and shall provide routine updates to the Steering Committee on its progress. The Steering Committee will identify potential overlap and coordination between Working Group activities and will suggest opportunities for integration or sharing resources between and among Working Group activities.

- Working Group reports and other documents will typically be provided to the Steering Committee for review and comment two to three weeks prior to final deliverable due dates. The Steering Committee will review and assess Working Group products against the overall objectives and purpose of the Clean Energy Advisory Council and Working Groups. The Working Group shall consider Steering Committee comments and shall document whether it has incorporated or rejected each comment with associated rationale in a new section of the report or in an appendix to the report. The Working Group retains ownership of final work products and is under no obligation to revise its recommendations in response to Steering Committee feedback. The Working Group shall work with Staff to ensure all final work products are filed in DMM and posted to the DPS website.

### *Initial Objectives:*

The Working Group will conduct a number of activities that are closely linked and therefore is encouraged to structure itself and its work plan to meet the discrete needs of each initial objective outlined below while ensuring that objectives are informed by one another.

- (1) ~~Evaluation Guidelines~~ – Conduct a review of the “New York Evaluation Plan Guidance for EEPS Program Administrators” to determine what changes are necessary to meet the current and future needs of New York’s clean energy programs. Recommendations should balance the need for objective analysis with producing more expedient and actionable information to inform policy decisions and improve individual efforts, including the accuracy and reliability of foundational tools, such as the Technical Resource Manual. Scope to be considered in (5) Recommendation Regarding Continuation of Working Group Activities: Integrate learning from REV demonstration projects and other REV activities in the conduct of this task. Integrate new approaches to evaluation of market transformation programs.
- ~~(2)(1) Coordination of EM&V Activities – Serve as a venue for NYSERDA and Utilities to ensure EM&V activities are properly informed and complementary rather than duplicative and that results are effectively shared with one another and other stakeholders.~~
- ~~(3)(2) Performance Metrics – Phase 1:~~ Develop common definitions and methods for tracking and reporting various performance metrics, ~~including metrics applicable to market transformation strategies.~~ This work shall be informed from the review of current data tracking requirements to be completed by the E<sup>2</sup> Working Group that preceded the CEAC. The work shall identify program/initiative specific metrics needed to effectively gauge progress. ~~Phase 2: Develop common definitions and methods for tracking and reporting performance metrics applicable to market transformation strategies. This work shall be informed by, as well as~~ information gathering on best practices in market transformation measurement. The work shall identify ~~both program/initiative specific and~~ broad market-level metrics needed to effectively gauge progress.
- (3) On-line Dashboard – Provide input to NYSERDA for use in developing and implementing an online dashboard that will allow for tracking of key performance metrics of all ratepayer funded clean energy activities. The online dashboard should provide an effective way to provide transparency to stakeholders, while minimizing the administrative burden of compiling more traditional quarterly reporting.

- (4) Coordination of EM&V Activities – Serve as a venue for NYSERDA and Utilities to ensure EM&V activities are properly informed and complementary rather than duplicative and that results are effectively shared with one another and other stakeholders.
- (5) Recommendation Regarding Continuation of Working Group Activities - Determination as to whether the Working Group has fulfilled its purpose upon the completion of the initial objectives or recommended additional objectives and tasks for the Working Group to pursue.

*Tasks/Deliverables:*

Task/Deliverable	Expected Completion Date
Final Metrics, Tracking & Performance Assessment Working Group Scope, including member list and member roles provided to Steering Committee <ul style="list-style-type: none"> <li>• Provide to DPS Staff</li> <li>• Final Filed in DMM</li> </ul>	6/10/16 6/17/16
Initial detailed Metrics, Tracking & Performance Assessment Work Plan <ul style="list-style-type: none"> <li>• Draft submitted to CEAC Steering Committee for Comment</li> <li>• Final filed in DMM</li> </ul>	7/1/16 8/1/16
Evaluation Guidelines Recommendations Report <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to <del>Council</del>CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul> <p><i>*Note: The 1/21/2016 CEF Framework Order in Case 14-M-0094 directed Staff to issue revised Evaluation Guidelines by November 1, 2016.</i></p>	8/10/16 9/9/16 10/3/16
Performance Metrics Recommendations Report: <u>Phase 1</u> <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to <del>Council</del>CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	9/9/16 12/23/16 1/25/17
<u>Performance Metrics Recommendations Report: Phase 2</u> <ul style="list-style-type: none"> <li>• <u>Outline Submitted to CEAC Steering Committee for Comment</u></li> <li>• <u>Draft Submitted to <del>Council</del>CEAC Steering Committee for Comment</u></li> <li>• <u>Final Filed in DMM</u></li> </ul>	<u>Q1 2017</u> <u>Q3 2017</u> <u>Q3 2017</u>
Online Dashboard Recommendations Report	

Task/Deliverable	Expected Completion Date
<ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to <del>Council</del> <u>CEAC</u> Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	<p>11/17/16</p> <p>1/26/17</p> <p>2/23/17</p>
<p>EM&amp;V Coordination Plan providing recommendations and a plan for using the Council as a means for coordination of activities and information sharing.</p> <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to <del>Council</del> <u>CEAC</u> Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	<p><del>10/7/16</del> <u>Q2 2017</u></p> <p><del>12/1/16</del> <u>Q4 2017</u></p> <p><del>1/9/17</del> <u>Q4 2017</u></p>
<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> </ul>	
<p>Provide a Recommendation to the Steering Committee as to whether the Working Group has completed its purpose and should be folded or provide a revised Working Group Scope with additional objectives, tasks and deliverables.</p>	<p>At any time, but no later than 90 days following the completion of previously assigned deliverables</p>

*Members:*

<b>Name</b>	<b>Role</b>	<b>Company/Organization</b>	<b>Email</b>
<del>Steven Mysholowsky</del>	<del>Co-Chair</del>	<del>Con Edison</del>	<del><a href="mailto:mysholowskys@coned.com">mysholowskys@coned.com</a></del>
Jennifer Meissner	Co-Chair*	NYSERDA	<a href="mailto:Jennifer.Meissner@nyserda.ny.gov">Jennifer.Meissner@nyserda.ny.gov</a>
Tricia Cioni	Designee	Cascade Energy	<a href="mailto:tricia.cioni@energysmartindustrial.com">tricia.cioni@energysmartindustrial.com</a>
Jon Maxwell	Alternate Designee	ERS	<a href="mailto:jmaxwell@ers-inc.com">jmaxwell@ers-inc.com</a>
Darren Suarez	Member	Business Council	<a href="mailto:darren.suarez@bcnys.org">darren.suarez@bcnys.org</a>
Michael Lauchaire	Member	Central Hudson	<a href="mailto:mlauchaire@cenhud.com">mlauchaire@cenhud.com</a>
Mitch Rosenberg	Member	DNV GL	<a href="mailto:mitch.rosenberg@dnvgl.com">mitch.rosenberg@dnvgl.com</a>
Peggie Neville	Member	DPS	<a href="mailto:Peggie.Neville@dps.ny.gov">Peggie.Neville@dps.ny.gov</a>
Jake Oster	Member	EnergySavvy	<a href="mailto:jake@energysavvy.com">jake@energysavvy.com</a>
Steve Bonanno	Member	National Grid	<a href="mailto:Stephen.Bonanno@nationalgrid.com">Stephen.Bonanno@nationalgrid.com</a>
Evan Crahen	Member	NFG	<a href="mailto:CrahenE@natfuel.com">CrahenE@natfuel.com</a>
Lynn Hoefgen	Member	NMR	<a href="mailto:lhoefgen@nmrgroupinc.com">lhoefgen@nmrgroupinc.com</a>
Arvind Jaggi	Member	NYISO	<a href="mailto:AJaggi@nyiso.com">AJaggi@nyiso.com</a>
Christine Keta	Member	NYPA	<a href="mailto:christine.keta@nypa.gov">christine.keta@nypa.gov</a>
John Zabliski	Member	NYSEG/RG&E	<a href="mailto:John_Zabliski@RGE.com">John_Zabliski@RGE.com</a>
Sandra Eason-Perez	Member	O&R	<a href="mailto:easonperezs@oru.com">easonperezs@oru.com</a>
<b><u>Rosanna Jimenez</u></b>	<b><u>Member</u></b>	<b><u>Con Edison</u></b>	<b><u><a href="mailto:jimenezr@coned.com">jimenezr@coned.com</a></u></b>
Sam Swanson	Member	Pace Energy and Climate Center	<a href="mailto:sswanson@law.pace.edu">sswanson@law.pace.edu</a>
Karla Loeb	Member	PosiGen	<a href="mailto:kloeb@posigen.com">kloeb@posigen.com</a>
Dimple Gandhi	Member	PSEG LI	<a href="mailto:dimple.gandhi@pseg.com">dimple.gandhi@pseg.com</a>

\*Another co-chair will be selected in the coming weeks.

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## *Voluntary Investment & Other Market Development Working Group Scope*

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### *Purpose:*

The overall purpose of the Voluntary Investment & Other Market Development Working Group is to develop strategies to maximize energy efficiency, renewable energy and distributed energy resources (DER) deployment, identifying approaches for adoption in the non-residential sectors, which may also include approaches that encourage and recognize voluntary investments in clean energy technology and solutions that help accelerate and increase achievement of the Clean Energy Standard and State Energy Plan (SEP) goals more broadly.

### *Guiding Principles & Clean Energy Advisory Council (CEAC) Protocols:*

Working Group activities in support of feasible and impactful findings are expected to include:

- Conducting and implementing Working Group activities with transparency and openness;
- Planning and implementing a work agenda and schedule of activities in support of the Working Group objectives;
- Compiling research;
- Directing analysis and studies;
- Soliciting expert advice;
- Developing options and proposals for consideration with particular focus and emphasis on implications and benefits to customers;
- Assessing options and proposals against objectives, and arriving at written feasible recommendations that provide the underlying rationale and, as needed, documents dissenting views along with associated rationale;
- Informing the development and implementation of programs among New York's clean energy program administrators;
- Providing regular written updates on the Working Group's activities and progress; and
- Sharing final work products and notable interim work products.

Protocols regarding CEAC Steering Committee and Working Group interactions include:

- Working Group scopes are authorized by the Steering Committee. Working Groups may at any time propose revisions and additions to the Working Group scopes for Steering Committee consideration but the initial objectives and deliverables of each group will focus on Commission assigned activities. The Steering Committee will guide and authorize Working Group scopes that lead to recommendations that help inform the future development of programs.
- Each Working Group will establish its own work plan and schedule and should incorporate opportunities for non-member input and feedback, as appropriate and feasible and shall provide routine updates to the Steering Committee on its progress. The Steering Committee will identify potential overlap and coordination between Working Group activities and will suggest opportunities for integration or sharing resources between and among Working Group activities.

- Working Group reports and other documents will typically be provided to the Steering Committee for review and comment two to three weeks prior to final deliverable due dates. The Steering Committee will review and assess Working Group products against the overall objectives and purpose of the Clean Energy Advisory Council and Working Groups. The Working Group shall consider Steering Committee comments and shall document whether it has incorporated or rejected each comment with associated rationale in a new section of the report or in an appendix to the report. The Working Group retains ownership of final work products and is under no obligation to revise its recommendations in response to Steering Committee feedback. The Working Group shall work with Staff to ensure all final work products are filed in DMM and posted to the DPS website.

### *Initial Objectives:*

The Voluntary Investment & Other Market Development Working Group is initially tasked with:

(1) Voluntary Investment Pilot Parameters – Develop parameters to guide potential Voluntary Investment Pilots, which at a minimum must identify a known barrier(s) that the pilot must be designed to address, elicit outcomes that demonstrate ‘additionality,’ ‘replicability,’ and ‘scalability,’ as supported through voluntary investment, identify possible ‘sectors,’ ‘categories,’ or ‘activities’ that will be considered appropriate for pilot projects and measurement and verification for how each pilot will prove its effectiveness in eliciting private, third-party investment.

~~(2)~~ Voluntary Investment Research and Recommendations Report – Develop recommendations for incentives and/or other approaches that foster voluntary investments in energy efficiency, renewable energy and DER. The Working Group shall explore opportunities that maximize energy efficiency and DER deployment in the commercial and industrial sectors, potentially identifying new mechanisms and accounting protocols that both facilitate voluntary investments in clean energy technologies, and can help accelerate and increase achievement of the Clean Energy Standard and SEP goals. The Working Group shall consider early learnings from utility Self-Direct programs, NY-Prize initiative, REV demonstrations, development of the NYGATS/REC markets, and any other initiatives that can provide useful, “real-world” examples to inform approaches to voluntary market activity. ~~the utilities’ experiences with the Self Direct Programs and other proposals for self-directed activities, such as Community Choice Aggregation.~~ To the extent that the proposal includes recommendations regarding collection and allocation of ratepayer funding, the proposal should analyze the impact of such changes on all customer classes. ~~The Working Group’s Voluntary Investment Recommendation Report will be considered by Staff in the development of a Voluntary Investment Proposal that the Commission directed Staff to file by December 1, 2016. Staff’s proposal will be issued for public comment.~~

~~(2)~~ (3) Community Choice Aggregation Recommendations Report - In completion of the direction from the Commission to look at Community Choice Aggregation (See Order in Case 14-M-0224) regarding how CCA can accelerate the adoption of energy efficiency, renewable energy and distributed energy resources, a subgroup of the larger working group will develop a report to examine the working group will examine such issues in a second report that will look at CCA models, the degree to which the model enables voluntary investment, and as well as policy and program considerations that will advance effective CCA activity, which also advance the State’s clean energy goals.

~~(3)(4)~~ Recommendation Regarding Continuation of Working Group Activities - Determination as to whether the Working Group has fulfilled its purpose upon the completion of the initial objectives or recommended additional objectives and tasks for the Working Group to pursue.

*Tasks/Deliverables:*

Task/Deliverable	Expected Completion Date
Provide final Voluntary Investment and other Market Development Work Scope, including member list and member roles provided to Steering Committee <ul style="list-style-type: none"> <li>• Provide to DPS Staff</li> <li>• Final Filed in DMM</li> </ul>	6/10/16 6/17/16
Initial detailed Voluntary Investment and other Market Development Work Plan <ul style="list-style-type: none"> <li>• Draft submitted to CEAC Steering Committee</li> <li>• Final filed in DMM</li> </ul>	7/1/16 8/1/16
<u>Voluntary Investment Pilot Parameters Report:</u> <ul style="list-style-type: none"> <li>• <u>Draft Submitted to CEAC Steering Committee for Comment</u></li> <li>• <u>Final Filed in DMM</u></li> </ul>	<u>11/23/16</u> <u>12/21/16</u>
Voluntary Investment <u>Research and</u> Recommendations Report: <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul> <p><i>Note: The 1/21/2016 CEF Framework Order in Case 14-M-0094 directed Staff to file a proposal that maximizes energy efficiency and DER deployment in the C&amp;I sectors through incentives for voluntary investments in clean energy technology that help accelerate and increase achievement of the CES and SEP goals by December 1, 2016.</i></p>	<u>Q2 2017</u> <del>8/10/16</del> <u>Q3 2017</u> <del>10/5/16</del> <u>Q3 2017</u> <del>11/2/16</del>
Community Choice Aggregation Recommendations Report: <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	<u>Q2 2017</u> <del>TBD</del> <u>Q3 2017</u> <del>TBD</del> <u>Q3 2017</u> <del>TBD</del>
Provide a Recommendation to the Steering Committee as to whether the Working Group has completed its purpose and should be folded or provide a revised Working Group Scope with additional objectives, tasks and deliverables.	At any time, but no later than 90 days following the completion of previously assigned deliverables

*Members:*

<b>Name</b>	<b>Role</b>	<b>Company/Organization</b>	<b>Email</b>
Tom Rienzo	Co-Chair	DPS	<a href="mailto:Thomas.Rienzo@dps.ny.gov">Thomas.Rienzo@dps.ny.gov</a>
John Williams	Co-Chair	NYSERDA	<a href="mailto:John.Williams@nyserda.ny.gov">John.Williams@nyserda.ny.gov</a>
Mark Lorentzen	Designee	TRC	<a href="mailto:mlorentzen@trcsolutions.com">mlorentzen@trcsolutions.com</a>
William Acker	Alternate Designee	NY-BEST Consortium	<a href="mailto:acker@ny-best.org">acker@ny-best.org</a>
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*Low & Moderate Income Clean Energy Initiatives  
Working Group Scope*

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*Purpose:*

The Low & Moderate Income (LMI) Clean Energy Initiatives Working Group will provide the venue for NYSERDA, the Utilities, and other interested stakeholders to actively evaluate alternative approaches for the delivery of services to LMI customers that can improve consumer value, for the customers served as well as for the rate-payer funding invested.

*Guiding Principles & Clean Energy Advisory Council (CEAC) Protocols:*

Working Group activities in support of feasible and impactful findings are expected to include:

- Conducting and implementing Working Group activities with transparency and openness;
- Planning and implementing a work agenda and schedule of activities in support of the Working Group objectives;
- Compiling research;
- Directing analysis and studies;
- Soliciting expert advice;
- Developing options and proposals for consideration with particular focus and emphasis on implications and benefits to customers;
- Assessing options and proposals against objectives, and arriving at written feasible recommendations that provide the underlying rationale and, as needed, documents dissenting views along with associated rationale;
- Informing the development and implementation of programs among New York's clean energy program administrators;
- Providing regular written updates on the Working Group's activities and progress; and
- Sharing final work products and notable interim work products.

Protocols regarding CEAC Steering Committee and Working Group interactions include:

- Working Group scopes are authorized by the Steering Committee. Working Groups may at any time propose revisions and additions to the Working Group scopes for Steering Committee consideration but the initial objectives and deliverables of each group will focus on Commission assigned activities. The Steering Committee will guide and authorize Working Group scopes that lead to recommendations that help inform the future development of programs.
- Each Working Group will establish its own work plan and schedule and should incorporate opportunities for non-member input and feedback, as appropriate and feasible and shall provide routine updates to the Steering Committee on its progress. The Steering Committee will identify potential overlap and coordination between Working Group activities and will suggest opportunities for integration or sharing resources between and among Working Group activities.
- Working Group reports and other documents will typically be provided to the Steering Committee for review and comment two to three weeks prior to final deliverable due dates. The Steering Committee will review and assess Working Group products against the overall

objectives and purpose of the Clean Energy Advisory Council and Working Groups. The Working Group shall consider Steering Committee comments and shall document whether it has incorporated or rejected each comment with associated rationale in a new section of the report or in an appendix to the report. The Working Group retains ownership of final work products and is under no obligation to revise its recommendations in response to Steering Committee feedback. The Working Group shall work with Staff to ensure all final work products are filed in DMM and posted to the DPS website.

### *Initial Objectives:*

The Low-Moderate Income (LMI) Clean Energy Initiatives Working Group is initially tasked with:

- (1) Report on Alternative Approaches to Providing Low-Moderate Income (LMI) Clean Energy Services – Investigate and evaluate alternatives to the current delivery of services to LMI customers that can improve consumer value. These services include, among other things, bill reduction, energy efficiency services and renewable generation. Tasks include an assessment of the strengths and weaknesses of current approaches to delivery of the aforementioned services to LMI customers in New York; identification and documentation of alternative approaches deployed in other jurisdictions including the strengths and weaknesses of each; and a summary of findings regarding opportunities for improved delivery of services, including the potential for coordinating the delivery of energy efficiency and renewable generation to the LMI population. The Working Group will develop a report documenting its findings. The report will outline well-defined good practice approaches and specific transitional considerations. The Working Group's report will inform the LMI Chapter of NYSERDA's Investment Plan and Utilities' future Energy Efficiency Transition Implementation Plans and Budgets and Metrics Filings, as well as other clean energy activities.
- (2) Recommendation Regarding Continuation of Working Group Activities - Determination as to whether the Working Group has fulfilled its purpose upon the completion of the initial objectives or recommended additional objectives and tasks for the Working Group to pursue.

*Tasks/Deliverables:*

Task/Deliverable	Expected Completion Date
Final Low & Moderate Income (LMI) Clean Energy Initiatives Working Scope, including member list and member roles provided to Steering Committee <ul style="list-style-type: none"> <li>• Provide to DPS Staff</li> <li>• Final Filed in DMM</li> </ul>	6/10/16 6/17/16
Initial detailed Low & Moderate Income (LMI) Clean Energy Initiatives Work Plan <ul style="list-style-type: none"> <li>• Draft submitted to CEAC Steering Committee for Comment</li> <li>• Final filed in DMM</li> </ul>	7/1/16 8/1/16
Report on Alternative Approaches to Providing Low & Moderate Income Clean Energy Services, including the components described in the objective above. <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	8/10/16 <del>10/24/16</del> 12/2/16 <del>11/21/16</del> 1/17/17
Provide a Recommendation to the Steering Committee as to whether the Working Group has completed its purpose and should be folded or provide a revised Working Group Scope with additional objectives, tasks and deliverables.	At any time, but no later than 90 days following the completion of previously assigned deliverables

*Members:*

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## *REV Energy Efficiency Best Practices Working Group Scope*

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### *Purpose:*

The overall purpose of the REV Energy Efficiency Best Practices Working Group is to share the most promising practices for learning, replication, and impact across service territories as the REV framework is implemented. The Working Group will also consider successful approaches employed in other states and countries.

### *Guiding Principles & Clean Energy Advisory Council (CEAC) Protocols:*

Working Group activities in support of feasible and impactful findings are expected to include:

- Conducting and implementing Working Group activities with transparency and openness;
- Planning and implementing a work agenda and schedule of activities in support of the Working Group objectives;
- Compiling research;
- Directing analysis and studies;
- Soliciting expert advice;
- Developing options and proposals for consideration with particular focus and emphasis on implications and benefits to customers;
- Assessing options and proposals against objectives, and arriving at written feasible recommendations that provide the underlying rationale and, as needed, documents dissenting views along with associated rationale;
- Informing the development and implementation of programs among New York's clean energy program administrators;
- Providing regular written updates on the Working Group's activities and progress; and
- Sharing final work products and notable interim work products.

Protocols regarding CEAC Steering Committee and Working Group interactions include:

- Working Group scopes are authorized by the Steering Committee. Working Groups may at any time propose revisions and additions to the Working Group scopes for Steering Committee consideration but the initial objectives and deliverables of each group will focus on Commission assigned activities. The Steering Committee will guide and authorize Working Group scopes that lead to recommendations that help inform the future development of programs.
- Each Working Group will establish its own work plan and schedule and should incorporate opportunities for non-member input and feedback, as appropriate and feasible and shall provide routine updates to the Steering Committee on its progress. The Steering Committee will identify potential overlap and coordination between Working Group activities and will suggest opportunities for integration or sharing resources between and among Working Group activities.
- Working Group reports and other documents will typically be provided to the Steering Committee for review and comment two to three weeks prior to final deliverable due dates. The Steering Committee will review and assess Working Group products against the overall

objectives and purpose of the Clean Energy Advisory Council and Working Groups. The Working Group shall consider Steering Committee comments and shall document whether it has incorporated or rejected each comment with associated rationale in a new section of the report or in an appendix to the report. The Working Group retains ownership of final work products and is under no obligation to revise its recommendations in response to Steering Committee feedback. The Working Group shall work with Staff to ensure all final work products are filed in DMM and posted to the DPS website.

### *Initial Objectives:*

The REV Energy Efficiency Best Practices Working Group is initially tasked with:

- (1) Best Practices Guide – Develop a REV Energy Efficiency Best Practices Guide, to be filed with the Secretary, outlining energy efficiency program best practices under a REV framework, and including a process for future revisions and updates. To inform development of the Guide, the Working Group shall conduct research and analysis of program data and shared performance assessments across New York State program administrators. It also will investigate relevant best practices from outside the state to identify replicable, high impact activities and promising innovative strategies, including pilots or demonstrations of new approaches. The Group is expected to update and revise the Guide such that the information in the Guide changes with the pace of technology and Commission directives.
- (2) Recommendation Regarding Continuation of Working Group Activities - Determination as to whether the Working Group has fulfilled its purpose upon the completion of the initial objectives or recommended additional objectives and tasks for the Working Group to pursue.

*Tasks/Deliverables:*

Task/Deliverable	Expected Completion Date
Provide final REV Energy Efficiency Best Practices Work Scope, specifically including member list and member roles provided to Steering Committee <ul style="list-style-type: none"> <li>• Provide to DPS Staff</li> <li>• Final Filed in DMM</li> </ul>	6/10/16 6/17/16
Initial detailed REV Energy Efficiency Best Practices Work Plan <ul style="list-style-type: none"> <li>• Draft submitted to CEAC Steering Committee for Comment</li> <li>• Final filed in DMM</li> </ul>	7/1/16 8/1/16
REV Energy Efficiency Best Practices Guide: <ul style="list-style-type: none"> <li>• Outline Submitted to CEAC Steering Committee for Comment</li> <li>• Draft Submitted to CEAC Steering Committee for Comment</li> <li>• Final Filed in DMM</li> </ul>	10/ <del>13</del> <u>27</u> /16 1/24/17 2/21/17
Provide a Recommendation to the Steering Committee as to whether the Working Group has completed its purpose and should be folded or provide a revised Working Group Scope with additional objectives, tasks and deliverables.	At any time, but no later than 90 days following the completion of previously assigned deliverables

*Members:*

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**DRAFT FOR REVIEW**  
**EXECUTIVE SUMMARY**

The Energy Efficiency Procurement & Markets Working Group was tasked with developing recommendations on: (1) energy efficiency targets that go beyond the State's existing Energy Efficiency Transition Implementation Plan (ETIP) and Clean Energy Fund (CEF) targets and (2) outcome-oriented energy efficiency metrics to support utility performance incentives. It was further directed to analyze the potential impacts of energy efficiency measures on peak load reduction and load factor metrics. These initial tasks are elements of the Working Group's overall work to develop strategies to create vibrant markets for energy efficiency as an attractive business opportunity, resulting in greater market-wide levels of energy efficiency with less need for direct ratepayer support.

An overarching finding of this Working Group report is that significantly more analytical work is needed in order to determine the most appropriate energy efficiency metrics and targets to support an outcome-oriented, performance-based incentive for utilities. In multiple instances, this report therefore presents options for initial implementation of such targets and metrics, preliminary recommendations from stakeholders (some as Working Group recommendations, others from defined group of stakeholders), or topics for consideration to inform additional analysis.

The Working Group was guided by a number of recent Commission orders, which direct the Clean Energy Advisory Council to develop outcome-oriented metrics and targets that facilitate the cost-effective achievement of the State's energy policy goals and policies, including the Clean Energy Standard (CES). Recent Commission orders reflect a policy preference to use market transformation strategies where possible so as to leverage customer investment and outside capital to accomplish greater energy savings. The Commission has indicated a preference for increasing energy efficiency investments beyond existing programs so as to achieve the State's energy policy goals in a cost effective manner. The Commission also has articulated its concerns regarding the fulfillment of State energy policy objectives using primarily surcharge-funded energy efficiency "resource acquisition" programs and the extant shareholder incentives framework, and has underscored the limitations of tying shareholder incentives narrowly to activity directly administered by the utility.

The Working Group defines an outcome-oriented metric to be a metric that measures net changes in normalized electricity consumption across the utility service territory over time, or net changes in normalized electric usage intensity across a sector over time, that is attributable to aggregate energy efficiency activities across that territory or sector, spanning programmatic and policy interventions and market-initiated activity that operates without utility or government direct incentives. Outcome-oriented metrics generally fall into two categories: energy consumption metrics and energy intensity metrics. Consumption metrics measure the change in overall energy use over time, for example, wholesale or retail electricity sales. Intensity metrics measure the energy use on a per unit level, for example, usage per capita or per square feet of building floor area.

In both cases, the measurement of energy usage would be normalized (or adjusted) for weather and certain other factors that drive load. The Working Group is unable to recommend a precise method for normalization and underscores the need for further analysis by specialists. The Working Group

recommends that mechanisms to account and adjust for fuel-switching be developed and phased in incrementally, with initial focus on “good load” from electric vehicles and heat pumps.

The Working Group identifies that one practical means to implement an outcome-oriented approach may be to further define a consumption metric that measures the reduction in normalized MWh sales for the service territory as a whole, so as to provide the utility with flexibility in achieving the corresponding target. The Working Group also finds that sector-specific intensity metrics could be tracked: electricity usage per capita in the residential sector and electricity usage per employee in the commercial sector appear most promising. For the industrial sector, more study is required on the availability of sufficiently granular data to construct an electric usage intensity metric.

The Working Group also notes that a possible approach would be the use of a complementary “hybrid” policy that combines both an outcome-based approach and a program-based approach. This approach recognizes the solid framework of utility incentives and funding tied directly to energy efficiency program-based achievements in New York and other states, and combines it with the potential for greater savings using an outcome-oriented approach that is still under development. This transitional approach will provide some means of assuring greater efficiency achievements in the near term without jeopardizing existing levels of savings and potentially a feasible, near-term ramp up in energy efficiency investment to facilitate the State’s energy policy goals.

With respect to setting electric efficiency targets, the Working Group found it premature to propose utility-specific performance incentive targets in this report since additional work is required to specify the outcome-based metric or metrics which would be used to measure progress toward the target level of performance. This report describes options for target setting rather than a consensus recommendation. One approach considered would develop minimum statewide energy efficiency achievement levels that cumulatively sum to the total efficiency assumed in the CES Order by 2030, while allowing for a non-linear trajectory over the 2016-2030 period with greater energy savings in the later years. A second approach would “ramp up” near-term 100% targets such that annual incremental energy efficiency savings as a percentage of sales increases by 0.4% per year. Under this strategy, long-term targets to 2030 would be set based on a new energy efficiency potential study that would be divided by utility service territory.

The Working Group conducted a “stack up” comparison between (1) compiled estimates of existing energy efficiency commitments across program administrators and expected savings from codes and standards and (2) illustrative electric efficiency targets. Analysis of this data varied among Working Group members. The majority of Working Group members concluded from this “stack up” comparison that in the near-term, the Commission should advance new opportunities for directing funds to mechanisms to facilitate greater investments in energy efficiency, including established utility programs and, to the extent feasible, new REV market mechanisms. In this view, a reduction in ratepayer support for energy efficiency is not realistic in the near-term, and risks backsliding on existing levels of achievement and jeopardizing cost-effective achievement of the State Energy Plan and Clean Energy Standard goals. Some Working Group members emphasized the need for further analysis to consider the cost-effectiveness of alternative approaches to achieving targets, and to quantify the higher level(s) of ratepayer collections that would be required to support achievement of higher energy efficiency targets in

the near-term as compared to the benefits realized from higher savings, including an anticipated reduction in CES compliance costs.

The Working group analyzed the potential impacts of energy efficiency measures on peak load reduction and load factor metrics. Our report discusses the complexity of this task, and finds that to accurately measure how energy efficiency installations affect “system efficiency” metrics it is necessary to (i) develop representative hourly load impact profiles for an energy efficiency measure being installed for a specific end use in a specific customer segment (for example, a LED light bulb installation in the living room of an apartment in northeastern Brooklyn) on a peak day, and (ii) develop an ability to aggregate such representative curves of all energy efficiency measures in a given area in order to accurately predict the overall impact of all those measures collectively at various levels of the electrical system on a peak day.

# DRAFT FOR REVIEW – Energy Efficiency Metrics and Targets Options Report

## 1. Introduction

The Clean Energy Fund (CEF) Order, issued by the New York State Public Service Commission (Commission) on January 21, 2016,<sup>1</sup> established the Clean Energy Advisory Council (CEAC or Council) in pursuit of consistent, effective, and transparent New York State Energy Research and Development Authority (NYSERDA) and utility clean energy programs. The CEAC functions in conjunction with and in support of New York’s Reforming the Energy Vision (REV)<sup>2</sup> and Clean Energy Standard (CES)<sup>3</sup> proceedings. The Council was chartered to support innovation through effective transition from current program offerings in order to “enable an effective and coordinated portfolio of programs and initiatives in pursuit of New York State energy objectives, with a focus on energy efficiency, other distributed energy resources (DER), and non-wire alternatives.”<sup>4</sup>

The Council is structured to establish a venue for embracing input from market participants and as a transparent means to create vibrant clean energy programs, consistent with REV initiatives. The Council consists of a steering committee and six working groups, with the steering committee co-chaired by the Department of Public Service (DPS) and NYSERDA. Other members include all New York utilities, including LIPA and NYPA. The Council furthermore consists of six working groups that report directly to the steering committee. The working groups include representatives from technology providers, environmental groups, the business community, and customer and low income advocates, as well as members from the organizations represented on the steering committee.

The Energy Efficiency Procurement & Markets Working Group (hereafter, the Working Group) was initially tasked with developing recommendations on: (1) energy efficiency targets that go beyond the State’s existing Energy Efficiency Transition Implementation Plan (ETIP) and Clean Energy Fund (CEF) targets; (2) outcome-oriented energy efficiency metrics to support utility performance incentives; and (3) strategies for creating markets for energy efficiency that provide attractive business opportunities and result in greater market-wide levels of energy efficiency with less need for direct ratepayer support.<sup>5</sup> This report discusses the Working Group’s research and analysis to date on energy efficiency targets and metrics, with the ultimate goal of constructing an outcome-oriented, performance-based incentive for utilities. In multiple areas, the Working Group finds that significant additional work is needed prior to making definitive recommendations.

Section 2 of this report discusses the existing policy and regulatory framework that informed this Working Group’s efforts, including the REV proceedings, the CEF Order, ETIPs, and the CES.

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<sup>1</sup> Case 14-M-0094 et al, Proceeding on Motion of the Commission to Consider a Clean Energy Fund, Order Authorizing the Clean Energy Fund Framework (CEF Order) (Issued and Effective January 21, 2016).

<sup>2</sup> Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision.

<sup>3</sup> Case 15-E-0302 Proceeding on Motion of the Clean Energy Standard (CES Order) (Issued and Effective August 1, 2016).

<sup>4</sup> Matter 16-00561 – In the Matter of the Clean Energy Advisory Council, CEAC Charter (Issued and Effective April 27, 2016).

<sup>5</sup> Matter 16-00561 – In the Matter of the Clean Energy Advisory Council, CEAC Energy Efficiency Procurement and Markets Working Group Scope (Issued and Effective September 2, 2016).

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Section 3 discusses options for transitioning from a traditional utility program-oriented metric to an outcome-oriented metric (i.e., electric usage intensity) by which energy efficiency achievement will be measured. The metrics considered by the Working Group are “outcome-oriented” in the sense that they measure energy efficiency activities and energy savings across a utility service territory, regardless of the source of those savings. In this manner, the metrics count progress achieved through policy and market interventions in addition to that achieved through utility and NYSERDA programs. Section 3 explores opportunities and the potential benefits and risks of different types of outcome-oriented metrics.

Section 4 of the report discusses normalization mechanisms and methodologies (i.e., weather adjustments and econometric modeling) in order to account for the largest sources of exogenous effects on outcome-orientated metrics. Section 5 of the report explores a performance incentive that “links increasing performance to increasing reward”<sup>6</sup> so as to provide a financially meaningful incentive for enterprise-wide attention by the utility.

In the context of the New York State Energy Plan and the CES, the Working Group further analyzed options and methodologies for developing a trajectory of statewide MWh reduction targets that would ramp up energy efficiency (corresponding to increasing energy efficiency over time) to achieve the long-term savings goals outlined in these policies. Section 6 describes proposals for setting a trajectory of energy efficiency targets through 2030, including both near- and long-term approaches, while recognizing that the path to realize these goals is not straightforward and requires mechanisms to support achievement.

Finally, in Section 7 of the report the Working Group discusses a framework for analyzing the potential impacts of energy efficiency measures on peak demand reduction and load factor, as outlined in the Commission’s Track 2 Order.<sup>7</sup>

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<sup>6</sup> Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Adopting A Ratemaking And Utility Revenue Model Policy Framework (REV Track 2 Order) (Issued And Effective May 19, 2016), at p.70.

<sup>7</sup> Id., at p.74.

## 2. Policy Goals and Direction under the REV Initiative

The Working Group supports the priority the Commission has placed on establishing energy efficiency performance incentives for New York utilities that are consistent with the State’s REV initiative and energy policy goals, including the achievement of a 40% reduction in greenhouse gas emissions from 1990 levels by 2030, and the cost-effective achievement of a 50% renewables goal by 2030.

### 2.1 Policy Background

In the REV Track 2 Order, the Commission used the term Earnings Adjustment Mechanism (EAM) to describe a specific performance-based incentive that uses financial rewards or penalties to align the financial interests of a utility’s shareholders with desirable system-wide outcomes, as conveyed through specific performance targets.<sup>8</sup> The Commission stated that “...creating new earning adjustment opportunities are both a fair and a necessary means of promoting change.”<sup>9</sup> The Commission instructed the CEAC to develop recommendations regarding metrics and targets to inform an EAM for energy efficiency, specifying that these energy savings targets should go beyond those included in the existing utility ETIPs and CEF programs.<sup>10</sup> The Commission further directed the CEAC to generically analyze the potential impacts of energy efficiency measures on peak reduction and load factor.

In developing these options and recommendations, the Working Group is guided and informed by a number of recent Commission orders, including those in the REV proceeding, ETIP, CEF, and the assumed contributions of energy efficiency in the CES. Past Commission experience with energy efficiency shareholder incentives is also instructive. Commission orders in these proceedings reflect the Commission’s clear policy preference to use market transformation strategies where possible so as to leverage customer investment and outside capital to accomplish greater energy savings than is currently feasible under existing programs.

The Commission has also indicated a preference for increasing energy efficiency investments beyond existing programs so as to achieve the State’s energy policy goals in a more cost effective manner. For example, in the REV Track 2 Order, the Commission explains that the CEAC “will recommend a target or set of targets” designed to “reduc[e] the cost of achieving” the State Energy Plan and CES goals.<sup>11</sup> Moreover, the CES Order states that “[e]nergy efficiency is a crucial and cost effective means to achieve clean energy objectives. Study after study has shown that when deployed well, energy efficiency is the cheapest and most effective manner to reduce carbon emissions in the energy sector.”<sup>12</sup> The Clean Energy Standard Order sets clean energy procurement targets using a methodology that, according to the Commission, assumes current energy efficiency targets will be extended. But in setting

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<sup>8</sup> Id., at p.59.

<sup>9</sup> Id.

<sup>10</sup> Id., at p.82.

<sup>11</sup> Id., at pp. 81-82.

<sup>12</sup> CES Order, at pp.81-82.

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those clean energy procurement targets, the Commission made clear that it anticipates the CEAC to recommend more ambitious levels of energy efficiency in accordance with its cost effectiveness:

The achievement of higher levels than the current energy efficiency targets can clearly benefit individual consumers and create system-wide value through the cost effective achievement of the [CES renewable goals] and carbon reduction goals. Higher levels of energy efficiency and its timing will positively impact both the total target and the trajectory proposed to achieve it. However, for the purpose of the initial calculation of the 2030 target, it is premature for the Commission to presume any level more than the current objectives. Rather, this determination will be revisited after the work of the Clean Energy Advisory Council is concluded.<sup>13</sup>

The Commission has had a number of opportunities in recent years to articulate its concerns regarding the fulfillment of State energy policy objectives using primarily surcharge-funded energy efficiency “resource acquisition” programs and the extant shareholder incentives framework. These existing programs are generally oriented toward using rebates and other incentives to overcome market barriers in order to procure energy efficiency savings in a cost-effective manner. Utility shareholder incentives were based on such efforts. The Commission has contrasted this approach to efficiency with a “market transformation” approach in which wide-scale penetration and market acceptance of efficiency measures is encouraged.

In the 2015 REV Framework Order (the “Track 1 Order”), the Commission noted that while existing surcharge-funded programs have been successful in achieving considerable kilowatt-hour (kWh) reductions, “achieving the carbon reduction goals proposed in the Draft State Energy Plan through existing [surcharge] approaches would require large increases in the surcharge which already represents a substantial portion of some customers’ bills.”<sup>14</sup> It noted the large potential for further efficiency gains that are not being effectively captured by current approaches and the risk that subsidy programs can displace market development, and it recommended implementing new approaches that create a more lasting market structure to catalyze investment in clean energy and energy efficiency. The Commission also emphasized the imperative that “the regulatory system must begin to properly value the attributes that the [System Benefit Charge] has been used to promote.” It further explained that “[a]chieving greater efficiency gains will require more private capital, not only in the form of sharing contributions under efficiency programs, but in the form of unsubsidized market activity.”<sup>15</sup>

The Commission provided further guidance in the REV Track 2 Order, noting that energy efficiency will remain a priority area in which utilities may earn performance-based incentives for energy efficiency, and reaffirming the principle set forth in the ETIP Order<sup>16</sup> that previously established electric and gas efficiency targets and budgets will serve as a baseline for future efforts. New targets to which

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<sup>13</sup> Id., at p.82.

<sup>14</sup> Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Adopting Regulatory Policy Framework and Implementation Plan (REV Framework Order) (Issued and Effective February 26, 2015).

<sup>15</sup> Id. at 77.

<sup>16</sup> Case 15-M-0252, In the Matter of Utility Energy Efficiency Programs, Order Authorizing Utility-Administered Energy Efficiency Portfolio Budgets and Targets for 2016 – 2018 (Issued and Effective January 22, 2016).

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EAMs will be tied, the Commission explained in the REV Track 2 Order, should exceed those existing targets. The Commission emphasizes the critical role that energy efficiency must play in achieving the CES and other state energy policy goals.<sup>17</sup>

The Commission also underscored the limitations of tying shareholder incentives narrowly to energy efficiency program activity that is directly administered by the utility, or specified in plans directed by regulators: “Outcome-based incentives will allow utilities to determine the most effective strategy to achieve policy objectives,” including cooperation with Distributed Energy Resource (DER) providers and development of new business concepts that would not be considered under narrow, program-based incentives.<sup>18</sup> It also noted that these incentives may be oriented toward outcomes that utilities can influence but not necessarily directly control.

The Commission has also had the opportunity to opine on the weaknesses it considers in the current approach, where complicated verification processes and debatable baseline assumptions cause controversy. The Commission further elaborated these concerns in the REV Track 2 Order, noting that incentives that depend on proving of a counterfactual can lead to contentious *ex post* review processes and burdensome administrative efforts. Instead, the Commission recommended that metrics should, where appropriate, establish fixed performance targets on a predetermined basis that avoid *ex ante* and/or *ex post* analytic exercises that rely on contestable calculations and input assumptions.<sup>19</sup>

In its discussion of energy efficiency EAMs, the Commission in the REV Track 2 Order makes clear that achievement under an outcome-oriented metric should be measured by system-wide energy savings that can be brought about by a combination of utility programs, third party initiated efforts, improvements in codes and standards, and market transformation. It also specifies: “one of the metrics for earning opportunity should be electric usage intensity across the utility’s territory...A number of energy intensity metrics can be considered, including kWh per capita, kWh per customer, and kWh per GDP.”<sup>20</sup>

The Commission provided insight into the methodology to be used for the metric, requiring that in implementing such a target, “[n]ormalization for weather, economic development, increases in electric vehicles and heat pumps, and possibly other factors will also be required,” with “[a] precise method to be recommended by the CEAC process.”<sup>21</sup> The Commission Order also allowed for utility proposals of additional energy efficiency earning opportunities based on program-specific savings, in instances where the utility exceeds minimum program targets, adopts new approaches to save ratepayer costs, or supports low-income affordability goals.<sup>22</sup>

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<sup>17</sup> REV Track 2 Order, at 79.

<sup>18</sup> Id., at p.62. [ADD definition of DER per REV Orders.]

<sup>19</sup> REV Track 2 Order at p.65

<sup>20</sup> Id., at p. 82.

<sup>21</sup> REV Track 2 Order, at p.82, fn.96.

<sup>22</sup> REV Track 2 Order, at 82-83.

### 3. Outcome-Oriented Metrics for Energy Efficiency

Utility performance incentives tied to energy efficiency are common nationwide and have been in use in New York State since 2008.<sup>23</sup> They are intended to encourage utility management support for energy efficiency initiatives and the delivery of effective programs, and to help align utility incentives with state policy goals by ensuring the utility is rewarded for greater amounts of energy efficiency.<sup>24</sup>

There are four central components of developing any EAM, including one for energy efficiency:<sup>25</sup>

1. *Policy goals* that specify performance areas of interest and desired outcomes;
2. *Metrics* that provide a standard of measurement for assessing how well a utility is performing in the specified areas of interest;
3. *Targets* that define the level of performance that a utility is expected to achieve during a particular time period, as measured by the metrics; and
4. *Financial incentives* that are based on the utility’s performance relative to the target.

In this report, the Working Group focuses specifically upon options for an outcome-oriented metric or metrics which are structured to encourage utility performance toward increasing system-wide energy efficiency, consistent with State policy goals. We adopt this focus in recognition of the Commission’s direction that under REV, utility earning opportunities for energy efficiency will “continue this direction away from utility-specific resource acquisition and toward more outcome-oriented metrics that encourage market participation and collaboration across efforts, and which support the State’s efficiency and carbon reduction goals.” The Working Group further appreciates that this anticipated shift in the basis for assessing and rewarding energy efficiency is both significant and unfamiliar. This report, while providing the Working Group’s synthesis of research related to outcome-oriented metrics and an interim recommendation for the Commission’s consideration, acknowledges that additional analytical study is necessary to determine adoption of an appropriate and specific outcome-oriented metric applicable to utilities.

As noted in Section 2, the Commission has acknowledged that there will be a phasing down of programmatic approaches to energy efficiency over time, as market transformation efforts take hold. Although the Working Group is focused on outcome-orientated metrics in this report, we understand that these outcomes will be produced by programmatic, policy, and market activities with programs continuing as long as necessary to achieve statewide efficiency targets and to address any market

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<sup>23</sup> In 2008, the Commission adopted shareholder incentives in the EEPS proceeding, geared toward approved energy efficiency targets. Case 07-M-0548, Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Concerning Utility Financial Incentives (Issued and Effective August 22, 2008).

<sup>24</sup> Lowry, M., Woolf, T., (January 2016), Performance-Based Regulation in a High Distributed Energy Resources Future, Future Electric Utility Regulation, retrieved from: [https://emp.lbl.gov/sites/all/files/lbnl-1004130\\_0.pdf](https://emp.lbl.gov/sites/all/files/lbnl-1004130_0.pdf), page 23.

<sup>25</sup> Whited, M., Woolf, T., (March 9, 2015), Utility Performance Incentive Mechanisms, A Handbook for Regulators, Western Interstate Energy Board, Synapse, retrieved from: [http://www.synapse-energy.com/sites/default/files/Utility%20Performance%20Incentive%20Mechanisms%2014-098\\_0.pdf](http://www.synapse-energy.com/sites/default/files/Utility%20Performance%20Incentive%20Mechanisms%2014-098_0.pdf).

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segments that are not adequately served by other mechanisms. As a result, a broad outcome-orientated EAM may need to be supplemented by more program-specific EAMs that are directed to achievement of complementary goals. This report further includes the recommendation from multiple Working Group members that successful energy efficiency investments, such as those made by utilities that enable energy efficiency providers to facilitate customer adoption of energy efficiency, should be increased and adequate funding should be made available to put that State on a trajectory to meet its 2030 energy policy goals.

This report does not extend to utility earning opportunities that may be built into a specific non-wires-alternative project (i.e., following the incentive model of Con Edison’s Brooklyn-Queens Demand Management program), or that may evolve to reflect broad system value creation through energy efficiency. The Working Group is at the initial stages of investigating how to identify and monetize the total value in a unit of energy efficiency, and in a subsequent report we anticipate addressing “shared savings” approaches which allow the utility to share some portion of the net benefits associated with energy efficiency.

### 3.1 Overview of Outcome-Oriented Metrics for Energy Efficiency

In the context of this report, the Working Group defines an “outcome-oriented” metric for electric energy efficiency to be **a metric that measures net changes in normalized electricity consumption across the utility service territory over time, or net changes in normalized electric usage intensity across a sector over time, that is attributable to aggregate energy efficiency activities<sup>26</sup> across that territory or sector, spanning programmatic and policy interventions and market-initiated activity that operates without utility or government direct incentives.** In contrast, the traditional program-oriented approach (as used under the State’s EEPS framework) measures energy efficiency achievement by estimating and summing up the measure-by-measure savings “acquired” through energy efficiency programs directly administered by the utility’s program administrator.

If an outcome-oriented metric and performance target are adopted to define an energy efficiency EAM, the utility’s performance with respect to that EAM will not be assessed based on an “attribution” determination of what proportion of energy savings are due to the utility’s direct intervention. Rather, all energy savings achievement in the utility service territory will “count” toward the performance target, as measured by a consumption metric that is normalized to the extent necessary for exogenous factors such as weather, for relevant fuel switching (including increases in “good load” such as that from electric vehicles) and for certain economic and/or demographic factors that also impact energy usage. In setting targets, it is important to identify economic and demographic factors and their impact on broader energy use patterns, as historic energy use appears to be distinctly impacted by such factors during different

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<sup>26</sup> This definition is the result of the specific direction from the Commission in the Track 2 Order to establish an energy efficiency outcome-oriented metric, although the Working Group acknowledges that there may be some merit in considering outcome-oriented metrics that do not attempt to disaggregate energy efficiency from other load modifiers such as distributed generation.

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historical periods. An outcome-oriented metric can be expected to capture savings not measured by traditional program-oriented evaluation approaches, including savings driven by market transformation, from more aggressive codes and standards, and insofar as interventions have cumulative effects on efficiency.

### 3.1.1 Opportunities to Align Utility Incentives with Policy Goals

A thoughtful shift toward outcome-oriented metrics for an energy efficiency EAM has the potential to align utility incentives with central policy goals under REV, as the Commission has emphasized. Notably:

- An outcome-oriented metric which measures energy efficiency achievement over the utility service territory can be more directly tied to state policy goals such as greenhouse gas emissions reductions or cost-effective implementation of the CES.
- Under REV, utilities are called upon to enable markets and to pursue innovation to drive outcomes. The Commission underscores that: “Outcome-based incentives will allow utilities to determine the most effective strategy to achieve policy objectives,” including cooperation with DER providers and development of new business concepts that would not be considered under narrow, program-based incentives.
- Rewarding territory-wide saving is intended to encourage utilities to collaborate with NYSERDA, the New York Power Authority (NYPA), local governments, and Community Choice Aggregation (CCA) localities toward achieving mutual local and statewide objectives, while reducing competition among program administrators to “lay claim” to energy savings.
- At present, a barrier to increased investment in market transformation is that efficiency program administrators are rarely given credit for such efforts; indeed, once an efficiency program accelerates the adoption of an efficient technology to become the new market standard, it is no longer able to claim credit for the resulting savings. An outcome-oriented metric will capture and give credit for longer-term market transformation savings.
- Relatedly, an outcome-oriented metric will encourage and reward improvements in building energy codes that translate to real energy reductions, such as those that will have an impact on existing buildings during retrofits and renovations at the end of capital cycles. These are often the most cost-effective improvements that can be made. Utilities will have an additional incentive to support code development and enforcement,<sup>27</sup> where the energy savings are significant and should count.
- Administrative burden may be reduced by relying on an outcome-oriented metric rather than requiring detailed measure-by-measure analysis to determine utility performance. The Working Group recognizes, however, that utilities and other entities undertaking energy efficiency will

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<sup>27</sup> Stellberg, Sarah, *Role for Utilities in Enhancing Building Energy Code Compliance*, ACEEE, Retrieved 7/27/2016 from: <http://aceee.org/files/proceedings/2012/data/papers/0193-000174.pdf>.  
*Utilities and Building Energy Codes: Air Quality and Energy Savings Opportunities*, The Institute for Electric Efficiency [http://www.imt.org/uploads/resources/files/IEE-IMT-UtilitiesAndBuildingEnergyCodes\\_FactSheet.pdf](http://www.imt.org/uploads/resources/files/IEE-IMT-UtilitiesAndBuildingEnergyCodes_FactSheet.pdf)

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continue to track and report a variety of metrics to support effective program delivery, planning, and oversight.

### 3.1.2 Methodological Complexities and Implementation Risks Require a Thoughtful Approach

The Working Group recognizes that the shift to an outcome-oriented metric for energy efficiency as described in this report also brings significant challenges and risks, requiring a thoughtful approach to development and implementation. These include:

- Methodological and empirical issues related to the measurement of energy efficiency achievement are complex, whether a conventional “measure-by-measure” approach or an “outcome-oriented” metric is adopted.
- In contrast to metered electricity generation, energy efficiency cannot be directly measured. The observed change in energy consumption must be compared to a counterfactual of what would have occurred in the absence of energy efficiency resources. The Working Group anticipates that significant work will be required to reach agreement upfront on an analytic approach to disentangle the change in energy use over time that is attributed to energy efficiency from other “structural” factors that also impact energy usage, such as weather and changing aspects of demographics and the economy. Section 3.2 discusses potential options in greater detail.
- With shareholder incentives at stake, the analytic approach and assumptions used are likely to be contested by parties. The choice of the energy consumption and/or energy intensity metric adopted, the baseline year or model adopted, and the normalization approach used to adjust actual results will directly impact the measured energy efficiency performance. The lack of a robust analysis on these matters and informed decisions about assumptions used upfront may signal a larger risk for an ex-post dispute.
- In contrast to the goal of encouraging cooperation, there is a risk of acrimony and finger-pointing if utilities determine that NYSERDA or NYPA are not delivering upon energy efficiency commitments, or are not allocating their resources equitably across utility service territories, and are thus hindering a utility in meeting its EAM targets. This risk is exacerbated when substantial contributions of energy efficiency are expected from still unproven and evolving efforts such as market animation and market transformation activities undertaken by NYSERDA and expectations from improved codes and standards without an agreed upon analytical basis to determine those expectations.
- If a utility perceives that it has limited control over whether or not an outcome-oriented EAM target is met or exceeded, it may have limited motivation to focus attention on energy efficiency (beyond meeting regulatory requirements). In general, higher levels of uncertainty with regard to achievement of an EAM will lower the expected value of the available shareholder incentive to the utility and potentially “dull” the incentive mechanism with consequent reduction in utility motivation.
- In the Working Group’s experience thus far, stakeholders hold markedly different views around what level of territory-wide energy efficiency savings constitutes a “realistically achievable” EAM target for an outcome-oriented metric. Particularly in the near-term, we recognize the risk

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of setting targets that are either (1) higher than the utility believes can be achieved with reasonable certainty, thus dampening utility motivation or (2) lower than what can be expected to be achieved by energy efficiency through efforts undertaken by various parties as well as through improved codes and standards, and market transformation activities, which further could allow the utility to earn shareholder incentives for providing average energy efficiency programs and unintentional “free riding” on activities initiated by other market actors.

- These concerns highlight the need for a transitional period, including potentially a period with a complementary hybrid approach, to allow adequate time for analyses to determine appropriate outcome oriented metrics and targets.

### 3.1.3 Lack of Comparable Implementation Experience in U.S. States

The Working Group is not aware of any U.S. states that currently tie utility performance incentives to an “outcome-oriented” energy efficiency metric that is intended to capture savings from aggregate program and policy interventions and market-initiated activity.<sup>28</sup> We do note prior experience adopting an electricity usage intensity metric in Maryland, as well as pilot studies in California and Massachusetts that utilized “top-down” econometric models to measure the impact of energy efficiency efforts on overall electricity and natural gas consumption.<sup>29</sup>

Under the 2008 EmPOWER Maryland Energy Efficiency Act, utilities were responsible for a 10% reduction in per capita energy consumption (with the Maryland Energy Administration expected to provide additional savings) and 15% per capita peak demand reductions by 2015, based on a 2007 use per capita baseline. Since the Act did not permit electricity sales to be weather normalized or otherwise adjusted for economic variables, Maryland’s Public Service Commission observed a disconnect between EmPOWER program achievement and the EmPOWER per capita goal achievement.<sup>30</sup> This experience underscores the importance of incorporating appropriate normalization adjustments into basing an outcome-oriented energy consumption or intensity metric as well as avoiding single “point-in-time” comparisons on weather-normalized energy data, as well as carefully considering adjustments for other structural factors.

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<sup>28</sup> Robbie Orvis and colleagues have published several policy briefs promoting outcome-oriented metrics for assessing and compensating utility performance on energy efficiency. Mr. Orvis indicated that he was not aware of any U.S. states that have adopted such metrics. See Orvis, Aggarwal & O’Boyle (April 2016), Metrics for Energy Efficiency: Options for Adjustment Mechanisms, America’s Power Plan, retrieved from <http://americaspowerplan.com/wp-content/uploads/2016/04/EEMetricDesign-white-paper.pdf>. Orvis (April 2016), Avoiding Counterfactuals in Performance Incentive Mechanisms: California as a Case Study, America’s Power Plan, retrieved: <http://americaspowerplan.com/wp-content/uploads/2016/04/AvoidingCounterfactuals-white-paper.pdf>.

<sup>29</sup> The pilot studies conducted in California and Massachusetts are discussed in Section 4.

<sup>30</sup> Public Service Commission of Maryland (March 2014), The EmPOWER Maryland Energy Efficiency Act Standard Report of 2014.

### 3.2 Options for Outcome-Oriented Metrics

In the assessment of the Working Group at this time, significant additional work is needed prior to making a definitive recommendation for an outcome-oriented metric and normalization method for an electric energy efficiency EAM. We therefore present a synthesis of our research and analysis to date, including a variety of options. Given time and capacity constraints, the Working Group decided to limit its initial investigation to metrics for electric efficiency, although we stress and acknowledge the importance of increasing efficiency savings across all fuels.

As discussed in this report, outcome-oriented metrics generally fall into two categories: energy consumption metrics and energy intensity metrics. Consumption metrics measure the change in overall energy use over time, for example, wholesale or retail electricity sales. Intensity metrics measure the energy use on a per unit level, for example, usage per capita or per square feet of building floor area. In both cases, the measurement of energy usage would be normalized (or adjusted) for weather and certain other factors that drive load.

While at first glance energy intensity metrics and energy consumption metrics appear to be conceptually distinct from one another, through normalization the line between these two types of techniques blurs. In a sense, an energy intensity metric is essentially the same as a consumption metric that is normalized according to the denominator of the intensity metric, with an assumption of an elasticity of one for the activity measure chosen as the denominator. Accordingly, using a consumption metric while normalizing for the factors to be captured in proposed intensity metrics may provide for the greatest degree of flexibility, while incenting the desired outcomes.

#### 3.2.1 Electric Energy Consumption Metrics

In the case of an outcome-oriented consumption metric, a utility would report the reduction in normalized megawatt-hours (MWh) electricity sales below a Commission-projected baseline level or target level throughout its service territory. Following the definition introduced previously, this metric would measure net changes in normalized electricity consumption across the utility service territory over a specific time period that is attributable to aggregate energy efficiency activities, spanning programmatic and policy interventions and market-initiated activity. (Methodological approaches to construct the baseline level and to normalize savings are discussed in section 4 below.) This consumption metric and corresponding target could be established either for the service territory as a whole or separately for each major customer (or end-use) sector: residential, commercial, and industrial. The Working Group evaluated this design feature.

The Working Group proposes that a consumption metric that measures the reduction in normalized MWh sales for the service territory as a whole is an appropriate starting point for an outcome-oriented EAM, given the newness of this approach and in order to provide the utility with flexibility in achieving the corresponding target. Depending upon the methodology used to construct the metric, in practice sector-specific econometric models may be developed to set baselines. Further, the methodology may vary by utility territory given the significant diversity in the types and relative significance of

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customer sectors across different utility territories in New York. Even so, the utility’s performance could be assessed relative to an aggregate MWh consumption target across all customers in its service territory.

The Working Group recognizes the risk that a consumption metric established for the overall service territory risks “leaving behind” some customers as efficiency efforts advance in New York. If the EAM metric does not track savings by customer segment, it may not effectively incentivize the utilities to facilitate efficiency that targets all significant customer segments. For instance, a utility could try to satisfy the majority of its energy efficiency target by focusing mainly on enabling energy efficiency services for commercial and/or industrial customers.<sup>31</sup> In order to address this parity issue, the Working Group suggests that utilities could report normalized MWh reductions or intensity metrics by customer segment as part of a scorecard that tracks energy efficiency progress but is not tied to EAM incentives. Based on utility sales data, it appears possible to do this kind of reporting for the residential, commercial, and industrial segments. Accurate reporting on a more granular level of customer segmentation, such as for multifamily buildings or low-income customers, might not be possible with currently available data. Bringing transparency to savings levels by customer type might help inform and improve the efficiency planning decisions of the utilities, as well as related regulatory decisions.

An outcome-oriented consumption metric could also measure performance with respect to either (1) the change in retail electricity sales at the customer meter or the (2) change in wholesale electricity sales at the point of generation or power purchase. To date, the Working Group has devoted limited attention to this distinction. Section 6 of this report discusses options for state-level and service territory-level energy efficiency targets in terms of wholesale load reductions, which provides consistency with the NYISO statewide electric energy econometric forecast, the energy efficiency assumptions included in the CES Order, and the energy efficiency potential findings of the 2014 Energy Efficiency and Renewable Energy Potential Study of New York State.<sup>32</sup> A metric based on changes in wholesale electricity sales also would encompass savings from reduced distribution-level electric line losses that can be achieved with utility deployment of Volt-Var Optimization (VVO) technologies.

### 3.2.2 Electric Usage Intensity Metrics

In the assessment of the Working Group, energy-intensity metrics and targets would need to be developed separately for the residential sector, the commercial sector, and the industrial sector to provide for forward-looking targets and meaningful interpretation. The U.S. Department of Energy (DOE)

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<sup>31</sup> To some extent, this issue of customer parity in efficiency services is a fundamental challenge for all energy efficiency procurement approaches. It reflects the basic economic realities and characteristics of the different customer segments. Some customer segments, particularly commercial and industrial customers, offer more cost-efficient procurement opportunities than other customer segments, especially residential and low-income customers. A single C&I project, for example, will produce a significant absolute quantity of energy savings while only requiring the transaction and customer acquisition costs of one project. Yet it may take acquiring many residential customers to achieve the same quantity of savings, but with the disadvantage of higher overall transaction and customer acquisition costs.

<sup>32</sup> Energy Efficiency and Renewable Energy Potential Study of New York State. Prepared by Mosenthal, Bower, Trombley, Hill, and Lange for the New York Energy Research and Development Authority (NYSERDA), April, 2014.

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observes that: “declines in energy intensity are a proxy for efficiency improvements, provided a) energy intensity is represented at an appropriate level of disaggregation to provide meaningful interpretation, and b) other explanatory and behavioral factors are isolated and accounted for.”<sup>33</sup>

The DOE Office of Energy Efficiency and Renewable Energy has developed a system of energy intensity indicators for major end-use sectors of the U.S. economy (residential, commercial, industrial, and transportation), which are ultimately aggregated to an overall energy intensity index for the economy as a whole.<sup>34</sup> DOE uses the Log Mean Division index (LMDI) method to decompose aggregate energy intensity into energy-intensity indexes and “structural” indexes that adjust for weather, electrification, electrical generation efficiency, and compositional shifts across industrial subsectors; these indicators do not adjust for economic growth or income trends. The Working Group notes the DOE system of indicators and adjustment method as useful reference points, which may be applicable if New York State elects to develop and publish state-level indicators to track trends over time. But, as explained further below, we do not view the DOE’s multi-step methodology to develop energy intensity indexes as feasible for the purpose of setting an electric usage intensity EAM metric and prospective targets in the near term.

Rather, the Working Group expects that the “numerator” (MWh/kWh) of any electric usage EAM would be normalized for weather and other factors, comparable to the methodology that would need to be developed for a consumption metric. The interpretation of energy intensity metrics as indicators of changes in energy efficiency further depends upon the choice of the activity measure “denominator.”

Figure 1 below provides a resource for the potential future work needed to develop sector-specific energy intensity metrics that are amenable to both interpretation and target setting. It summarizes potential electric usage intensity metrics, provides an assessment of the availability of relevant data at the level of NYS utility service territories, and highlights notable strengths or concerns for each metric. Further detail on data sources by metric is provided as Appendix A.

The Working Group’s discussion and analysis of electric usage intensity metrics highlighted several salient, cross-cutting themes. With respect to the choice of activity measure (i.e., the denominator) for the metric:

- Analysis prepared for the DOE recommends that in setting energy intensity metrics, physical-based measures of activity are generally preferred, such as floor area in buildings (which is directly related to space conditioning and lighting).<sup>35</sup> Unfortunately, there are no publicly available annual time series estimates of either residential building floor area or commercial building floor space in the U.S., although data for certain jurisdictions may be available from local tax assessors’ offices, such as the NYC PLUTO database. Across the state’s utilities, it is unlikely that floor space data will be available or accurate enough to enable reliable calculation of intensity metrics based on floor area.

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<sup>33</sup> <http://www.energy.gov/eere/analysis/energy-intensity-indicators-efficiency-vs-intensity>

<sup>34</sup> The DOE system of energy intensity indicators is available at: <http://www.energy.gov/eere/analysis/energy-intensity-indicators>. Also see: Belzer, DB. (August 2014), *A Comprehensive System of Energy Intensity Indicators for the U.S.: Methods, Data, and Key Trends*, U.S. Department of Energy, Retrieved from: [http://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-22267.pdf](http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-22267.pdf).

<sup>35</sup> Belzer, DB.

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- The Working Group noted concerns about adopting a kWh/customer meter metric, which might otherwise be attractive given the ready availability of data. This is because a single meter may not accurately represent the customer premises being served; i.e., a meter can serve an individual building, part of a building, or a whole campus, making the metric less meaningful in heterogeneous sectors. While a kWh/customer meter metric is likely most meaningful for the residential sector, but population data for that sector population data also is readily available and is likely to be preferred. Additionally, the Working Group hypothesized that the number of utility meters serving buildings in the commercial, institutional, and multifamily sectors could increase to a meaningful extent with new market opportunities anticipated under REV (e.g., a shift from “master meters” to direct meters to enable customer participation in new rate structures, or meters for electric vehicle charging stations), or potentially due to utility “gaming” of the metric. In this event, a kWh/customer meter metric could decrease based on increasing the number of meters serving a given amount of space rather than due to decreasing the associated kWh consumption.
- Different views exist in the literature with regard to the appropriateness of adopting an energy-to-Gross Domestic Product (GDP) intensity metric outside of the industrial sector, or for the economy as a whole. Work prepared for the DOE emphasizes the limitations of the energy-GDP approach, including the fact that GDP is influenced by a variety of structural factors that affect energy consumption independent of underlying changes in energy efficiency.<sup>36</sup> At present, data limitations also exist with respect to historic data and forecasts of GDP at the state or service-territory level.

On the other hand, the Working Group recommends that further consideration and analysis of energy intensity metrics that measure total energy intensity, across electricity and fuel use be conducted. Two commonly used definitions of total energy are: 1) *delivered*, the sum of fuels and electricity use, and 2) *primary or source*, where electricity losses from electricity generation and transmission are assigned to the end user and added to delivered energy. Tracking a total energy usage intensity metric, and potentially developing a corresponding EAM, could be a means of recognizing and incenting utilities to facilitate actions that decrease energy usage across all fuels or accelerate environmentally beneficial fuel switching (see Section 4.4.2). Moreover, national energy intensity indicators reported in the United States and in Europe generally measure total energy usage. The Working Group emphasizes that it has not had the opportunity to conduct any substantial analysis of the potential for a utility EAM based on a total energy intensity metric.

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<sup>36</sup> Belzer, DB., at pp. 51-53.

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**Figure 1: Analysis of Potential Electric Usage Intensity Metrics by Customer Sector**

Metric	Description	Data Availability (Denominator)	Notable Strengths / Concerns
<b>Residential Sector</b>			
kWh per customer meter	<i>Weather-normalized residential sales divided by a count of residential meters in a utility's territory</i>	Counts of customer meters are readily available.	-Likely not applicable for commercial, industrial, and sub-metered facilities. -While more meaningful for the residential sector than for the C&I sectors, population data is likely preferred.
kWh per capita	<i>Weather-normalized residential sales divided by estimates of a utility territory's population.</i>	Population estimates at the county level are available annually from the U.S. Census Bureau. Population forecasts available.  Straightforward to aggregate to utility service territory.	+ Intuitive to interpret for residential sector. + Data is readily available and easy to map to utility territories. + Simple to create benchmark with other State performances. - Challenges when handling multifamily sub-metered energy sales.
kWh per household	<i>Weather-normalized residential sales divided by an estimate of the number of households in the utility territory.</i>	The American Community Survey (ACS) publishes the number of occupied housing units at the county level annually.	+ Intuitive to interpret for residential sector. + Data is readily available and easy to map to utility territories. + Simple to create benchmark with other State performances. - Challenges when handling multifamily energy sales.
kWh per square feet of occupied housing units	<i>Weather-normalized residential sales divided by an estimate of the floor area of occupied housing in the utility territory.</i>	No publicly available time series data on residential floor space. Very limited data available only in limited metropolitan areas.	- Serious data limitations. * Home sizes and use don't change often.

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<b>Commercial and Institutional</b>			
kWh per customer meter	<i>Weather-normalized commercial sales divided by a count of commercial meters in a utility's territory.</i>	Counts of customer meters are readily available.	<ul style="list-style-type: none"> <li>- Less meaningful in heterogeneous C&amp;I sectors: the meter can serve a building, partial building, or campus.</li> <li>- Potential that the number of meters serving a constant amount of space could increase significantly.</li> </ul>
kWh per square feet of commercial building space	<i>Weather-normalized commercial sales divided by an estimate of the floor area of commercial buildings in the utility territory.</i>	No publically available time series estimates of commercial floor space. CBECs data is insufficiently granular and infrequent. Private companies provide data, but their update frequency is unclear.	<ul style="list-style-type: none"> <li>- Serious data limitations; unlikely to be accurate enough to be reliable.</li> <li>- Direct data collection may be an unreasonable burden.</li> <li>- Only useful if data is available and Commercial vs. Industrial sales data could be accurately separated.</li> </ul>
kWh per employee	<i>Weather-normalized commercial sales divided by an estimate of the number of employees in the commercial/services sectors in the utility service territory.</i>	Monthly employment data by industry is available from the NYS Department of Labor. Data is reported statewide, by metropolitan area, and by minor county.	<ul style="list-style-type: none"> <li>+ Electric usage highly correlated with the number of employees.</li> <li>? May be difficult to map jobs data to utility territories.</li> <li>* Commercial and Industrial jobs will need to be separated based on industry codes.</li> </ul>
kWh per Gross State Product (GSP)	<i>Weather-normalized commercial sales divided by an estimate of the commercial-sector GSP in the utility service territory.</i>	Bureau of Economic Analysis (BEA) publishes gross domestic product (GDP) statistics for the nation, states, and metropolitan areas, but does not currently publish GDP by county. State GDP data is published quarterly, metropolitan data is published annually. No forecasts of GSP.	<ul style="list-style-type: none"> <li>- Mapping GSP data to utility territory is a challenge.</li> <li>- Isolating the load and GSP for the commercial sector could be problematic.</li> <li>- Major structural changes to the NY economy over time could result in misleading data.</li> <li>* DOE does not recommend commercial kWh/GDP given wide variability of commercial activity, however European nations use this metric for the services sector.</li> </ul>
<b>Industrial</b>			
kWh per GSP	<i>Weather-normalized industrial sales divided by an estimate of industrial-sector GSP (manufacturing and non-manufacturing) in the utility service territory</i>	More research is necessary to identify potential data sources.	<ul style="list-style-type: none"> <li>+ Useful measurement...</li> <li>- ...if it can be granularly broken down and separated from the commercial sector, which at this time may be difficult/impracticable.</li> <li>* Structural changes to industrial sector over time should be adjusted for in metric construction.</li> </ul>
<b>Commercial and Industrial (C&amp;I), if impractical to disaggregate data</b>			
kWh per GSP	<i>Weather-normalized commercial and industrial sales divided by an estimate</i>	Bureau of Economic Analysis (BEA) publishes gross domestic product	<ul style="list-style-type: none"> <li>+ Useful for broader statewide metric, but...</li> <li>- GSP will be difficult to calculate accurately when divided by utility</li> </ul>

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	<i>of the GSP in the utility service territory</i>	(GDP) statistics for the nation, states, and metropolitan areas, but does not currently publish GDP by county State GDP data is published quarterly, metropolitan data is published annually.	service territory.  -Less informative of actual energy performance when Commercial and Industrial cannot be parsed out.
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3.2.3 A Proposed Implementation Strategy

The Working Group acknowledges that additional analytical study is necessary to determine adoption of an appropriate and specific outcome-oriented metric applicable to utilities. In preparing this report, the Working Group focused upon advancing understanding of the outcome-oriented electricity consumption and electric usage intensity metrics described above. Based on our initial assessment, we suggest that a practical means to implement this outcome-oriented approach may be to start by further defining a consumption metric that measures reduction in normalized MWh consumption for the service territory as a whole, with corresponding targets for each utility. Sector-specific intensity metrics could be tracked to understand program effectiveness and inform program performance: electricity usage per capita in the residential sector and electricity usage per employee in the commercial sector appear most promising. For the industrial sector, more study is required on the level of granularity of data available to construct a metric such as electricity usage per industrial-sector Gross State Product, or alternatively a metric tracking program penetration (e.g. the number of customers that participated in a specific program over a given time period).

The Working Group also notes that a possible approach would be the use of a complementary “hybrid” policy that combines both an outcome-based approach and a program-based approach in order to effectively incentivize the utility to both collaborate with market participants, government, and communities, and to achieve or exceed its program goals. This approach recognizes the solid framework of utility incentives and funding tied directly to energy efficiency program-based achievements in New York and other states, and combines it with the potential for greater savings using an outcome-oriented approach that is still under development. This transitional approach will provide some means of assuring greater efficiency achievements in the near term without jeopardizing existing levels of savings and potentially a feasible, near-term ramp up in energy efficiency investment to facilitate the State’s energy policy goals.

## 4. Normalization Mechanisms and Methodologies to Measure Savings Attributable to Energy Efficiency

[SUBSTANTIAL REVISIONS TO SECTION 4 WERE MADE DURING THE REVIEW PERIOD]

In the Track 2 Order, the Commission recognized that an outcome-oriented metric for energy efficiency will require normalization of electricity sales for weather, economic development, increases in electric vehicles and heat pumps, and possibly other factors, and it instructed the CEAC to recommend a precise method in this regard. The Working Group underscores the need for further analysis prior to recommending a specific normalization method and outcome-oriented metric. In the section that follows, we propose a potential approach to normalize for weather, discuss possible econometric approaches to address economic and other factors that impact electricity consumption, and support the need to develop adjustments for fuel switching in a gradual manner.

### 4.1 Normalization Concepts in Traditional Utility Practice

The concept of “normalization” is commonly used in utility planning and ratemaking as a means to take variations in weather patterns out of the equation, which allows delivery volume and revenue forecasting for normal weather conditions. Because a major factor in determining load is weather, which is difficult to predict, utilities estimate the peak load under design weather conditions first and then determine a potential range of unusual volumes around that peak load. The process of estimating the design load is generally termed “weather adjusting.” In addition, a process called “weather normalization” adjusts energy usage so it can be compared to “normal” energy usage in other years. These comparisons allow for more accurate load and revenue forecasts for utility planning purposes.<sup>37</sup>

Load volume and revenue forecasts also are used in utility rate cases for purposes of determining customer volumetric charges and utility revenue requirements. Since a portion of the utility’s revenue requirement will typically be collected from customers through volumetric charges on a per kWh or per kW basis, the delivery volume is forecasted using econometric models that include weather normalized data and economic variables such as personal income, employment, and the cost of energy. These forecasted delivery volumes are further used for revenue decoupling purposes, where a utility’s expected normalized revenue is compared to actual revenue received, and any over or under recovery is recovered through a distribution-based surcharge. By separating – or “decoupling” – rate revenue from usage, utility revenues are less dependent on selling energy, thereby enabling the utility’s incentives to be better aligned with supporting energy efficiency efforts. In rate cases, both the utility and DPS file testimony propounding their respective forecasted delivery volume. Absent a settlement, an administrative law judge will determine what forecast should be utilized and make recommendations to the Commission for final dispensation.

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<sup>37</sup> Separately, a different type of weather adjustment is used for peak demand forecasting. Electric utilities conduct comprehensive planning processes to ensure the reliability of the grid. In order to ensure the reliability of their systems, utilities forecast peak demand for a peak-day design weather condition.

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In deriving its delivery volume forecast, the utilities and DPS use annual, quarterly, or monthly data to develop an econometric (regression) model that consists of a structural component and a time series component. The structural component of the model relates a dependent variable to a group of independent variables. The dependent variable can be the number of customers or electricity delivery volumes. The independent variables typically are weather and economic variables such as personal income and employment. Generally, weather variables are heating degree days (HDD) and cooling degree days (CDD). HDD measure how much (in degrees), and for how long (in days), the outside temperature was below a base temperature (generally 65°F). CDD provide a measure of how much, and for how long, the outside temperature was above that base temperature.

The weather normalization process uses the estimated relevant relationships (or parameters) and the departure of actual degree days from the normal degree days to remove the above- or below- normal impact on energy usage. For example, if the outside temperature was 4 degrees above the base temperature for 4 days, there would be a total of 16 cooling degree days over that period (4 degrees \* 4 days = 16 degree days). Normally, National Weather Service provided CDD and HDD information is used in this computation. However, because the National Weather Service does not provide a humidity modifier to CDD data, the CDD measure must be adjusted to reflect humidity conditions.

In addition to weather, demand for electric energy is directly related to demographics and economic activity. As population increases or the economy expands, demand for goods and services grow, and the businesses that provide goods and services increase, resulting in increases in energy use. In general, economic growth by itself not only leads to customer additions, but also results in increases in energy use by existing customers. When the economy grows, household income increases, resulting in home ownership and appliance purchases increases. These factors all lead to an increase in energy usage. Counteracting some of the drivers of increased energy usage is the total cost of electricity itself. Higher total energy costs in general place downward pressure on energy usage, and vice versa.

### **4.2 Applicability to Outcome-Oriented Metrics**

Correcting for weather-related effects is usually the only form of normalization used in rate cases. With additional appropriate normalization methods, the econometric models that utilities and DPS use to estimate delivery volumes may be extended to formulate outcome-oriented metrics for energy efficiency. As explained above, an outcome-oriented energy efficiency metric may focus on total energy usage (kWh) or energy intensity (e.g., kWh per customer), thus incenting utilities to facilitate actions that generally decrease electricity usage or its intensity.

Normalizing an outcome-oriented metric in order to control for exogenous factors entirely outside a utility's control (e.g., weather, economic activity, changes in the number of customers) is intended to ensure that the observed change in the metric is due to the true causal effects of the utilities' efforts to increase adoption of energy efficiency. Because disagreements between adversarial parties can occur with normalization and other forms of adjustment, transparent methodologies and data sources should be agreed upon upfront, at the time the metric is created. Similarly, outcome-oriented metrics should strive to minimize the need for ex-post adjustments to the maximum extent possible; however, ex-post adjustments

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may be necessary to account for certain factors such as observed fuel switching, as discussed in Section 4.4.

Approaches to evaluate and isolate exogenous effects include: (1) use of an econometric model that includes independent exogenous variables in order to determine the contribution of those variables to changes in energy use, distinct from the effects of energy efficiency measures on energy use and (2) use of an intensity metric that accounts for the effect of a single exogenous variable that is included as the “denominator” in the metric itself, albeit with an implied assumption of unitary elasticity for that variable.

In the case of an intensity metric, such as kWh per customer or kWh per unit of GDP, unitary elasticity implies that a 1% change in the denominator results in a 1% change in the numerator. Preliminary analysis by Con Edison suggests that this assumption does not hold true for any of the various variables it has analyzed.

By contrast, using an econometric model allows the model to predict how a unit change in each independent variable impacts energy use. For economic and other normalizations, the difference between forecasted and actual values of a variable could be applied to the relevant parameters to remove the economic forecasting errors on actual energy use. Section 4.3.2 discusses econometric modeling approaches considered by the Working Group to date, none of which are considered ready to implement for the purposes of an outcome-oriented metric as discussed in this report.

Under either general approach, electricity consumption should be normalized for weather variation by using a methodology agreed upon in advance and National Weather Service data. Although the Working Group expects weather normalization to be relatively straightforward, we note that there is variation in the precise weather normalization procedures adopted by NYS utilities in sales forecasts for rates cases; for example, the base temperature for calculating degree days varies. We propose for consideration that an objective weather normalization procedure could be to develop a regression model using daily sendout<sup>38</sup> data and weather data over a short period of time, likely seven days to one month. Within this time interval, electricity consumption and weather would be cleanly matched and the impact of changes in structural factors like the economy would be minimal. The weather normalized sendout data could then be aggregated for the year, and subsequently used either to construct an intensity metric or to develop an econometric model that adjusts for economic variables.

Normalizing for factors other than weather is likely to be more challenging where data is not readily available. In turn, adversarial disagreements may arise if data estimates are pieced together from available sources. For example, normalizing for GDP accounts for changes in the economy, but also requires a GDP estimate particular to a specific utility service territory. An initial assessment of data availability is addressed in Section 3.3.2 (see Figure 1), in our discussion of electric usage intensity metrics. In the near term, it may be desirable to set up processes for tracking these metrics using an agreed upon methodology so that data on which to base normalization factors is available in the future.

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<sup>38</sup> Sendout is the quantity measured at the output of the generators, effectively in “real time.” Sales data is obtained from meters at the customer’s site; in the case of sales data, the billing cycle must also be accounted for or there is a mismatch of degree days with sales.

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We further note the possibility of embedding running averages within an outcome-oriented metric (e.g., using 3-to 5-year weather averages) or excluding outliers from the metric (e.g., eliminating the hottest and coldest days).<sup>39</sup> This option requires further analysis. Smoothing data in this manner may result in the illusion of precision, while in fact removing data that is important for accurate analysis.

### 4.3 Options for Econometric Methodologies

The Working Group emphasizes that for the purposes of specifying a utility performance (EAM) metric, significantly more work is needed to develop an appropriate econometric methodology that can be used to measure the net change in electricity usage over time that is attributable to energy efficiency impact, disentangled from other drivers of system load to the extent possible. We also note that as penetration of DERs increases, it may prove challenging to isolate the impacts of energy efficiency from other DERs that provide similar energy use reductions, and thus challenging to develop appropriate outcome-oriented metrics and targets for a single type of resource. The necessary work going forward includes developing an appropriate econometric model or models; testing promising methods by back-fitting with historical NYS utility data; and iterating toward a metric that is acceptable to the Commission, utilities, and interested parties.

#### 4.3.1 Back-fit and Iterate to Refine Methodologies and Metrics

For any outcome-oriented metric under consideration, it is necessary to verify that the metric is appropriate for the purposes of measuring progress in the outcome being sought. This can be accomplished by “testing” the metric against historic data. The forecast for electricity consumption and load modification from DERs might be based on an econometric model that relates load to economic variables, demographics, weather, billing days, and penetration of DERs including energy efficiency. Such a model could then be used to derive an outcome-oriented metric measuring, for instance, growth in adoption of energy efficiency. Future targets for the metric measuring the energy efficiency outcome also could be set using the model.

To verify that the outcome-oriented metric selected is appropriate, the model parameters could be developed from historical relationships among variables (using historical data), with the future projections for the outcome-oriented metric determined by forecasts of the independent model variables and solving for the outcome-oriented metric; a description of an error inherent to the model is described in the following paragraph. Subsequently, the outcome-oriented metric that is developed could be calculated for historical periods and compared with known actual outcomes in those periods to verify that it was in fact an adequate measure of the outcome being sought.

A simple representation of the overall accuracy for any econometric model is the “error,” defined here as difference between the ex-post actual value of the dependent variable and the value that was

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<sup>39</sup> Such smoothing is suggested by Orvis and coauthors in “Metrics for Energy Efficiency: Options and Adjustment Mechanisms, America’s Power Plan,” April 2016.

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previously projected as the forecast for that variable. To understand the sources of such error, it is necessary to “back-fit” the true values of the independent variables into the model to determine how much of the error was simply due to changes in the actual inputs versus model-related forecast errors. For example, if the actual weather was less severe than assumed and the DER installations were greater than projected, these would help to explain the sources of some of the variance between the forecast and the actual, in a situation where electricity consumption is lower than what was forecasted. Any remaining difference between the actual and the forecast after this “back-fitting” could then be considered an error inherent in the model. The magnitude of this error can be a useful indicator of the model’s appropriateness for use in developing the outcome-oriented metric.

Additionally, adequate and reliable data related to projected variables becomes very important in analyzing the accuracy of the model used to assess the metric. For example, the outcome-oriented metric may have as one of its inputs an estimate of future electricity consumption reductions from solar photovoltaic (PV) installations, based on a projected number of installations and their expected energy savings per installation. However, if such assumptions were not accurate given divergent operational characteristics of the actual PV installations, and thus not representative of the true grid energy consumption reductions, it would be difficult to accurately back-fit the model. In such instances where there is a high level of uncertainty and lack of actual measured data to justify assumptions, it would be extremely difficult to disaggregate variances as a result of inappropriate assumptions from other variances such as, say, an increase or decrease in energy efficiency from what was forecasted.

With an increase in the number of types and magnitudes of the various DERs, it may become more difficult to appropriately determine the accuracy of the models used to assess an outcome-oriented metric – especially if targeted to one resource type, such as energy efficiency. For example, as the proliferation of other DERs increase, and as there are increases in multiple resource types with similar operational profiles, it may prove challenging to isolate the impacts of, say, energy efficiency from other DERs that provide similar energy use reductions, and thus challenging to develop appropriate outcome-oriented metrics and targets related to a single type of resource.

Further, any model(s) found appropriate and thereby adopted for the purpose of setting the baseline energy consumption against which energy savings are to be measured should be benchmarked annually against historical data to verify continued model accuracy. Benchmarking could be done in the form of a “back-cast,” where model results are compared to actual data for the most recent historical year. During benchmarking, model parameters can be adjusted (within the confines of the model’s theoretical and conceptual foundations) to achieve better agreement against actual historical data. Adjustments made to the model through such a benchmarking process would thus improve its forecasting accuracy. During such benchmarking exercises, both the model and the outcome-oriented metric should be evaluated for appropriateness of continued use.

### 4.3.2 Specific Econometric Modeling Approaches Investigated to Date

Below we briefly describe several options for econometric methodologies explored by the Working Group to date, with valued input from external experts. At this writing, none of the approaches that follow are recommended to establish an outcome-oriented metric and target for an energy efficiency

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EAM due to the challenges associated with developing an econometric model which is able to produce reasonably precise estimates of electricity sales forecasts and/or historical sales.

### *4.3.2.1 Setting a Target in Advance based on a Uniform Sales Forecast Model*

The first option considered would use econometric sales forecast models – i.e., developing one model for each major end-use customer sector – to project an aggregate weather-normalized MWh volume “baseline forecast” for a given target year without adjustments for energy efficiency or other DERs. For an outcome-oriented consumption metric, this approach would then set an overall load target in advance such that for the target year 20XX, the utility’s total weather-normalized MWh sales volume is expected to be [Target Normalized Load] or lower. Forecasted load reductions from on-site distributed generation would be included in setting the target; i.e., the target would be calculated as the unadjusted baseline forecast minus forecasted MWh reduction from distributed generation minus the target MWh reduction from aggregate energy efficiency activities. In contrast, it is recommended that fuel switching be addressed through an ex-post adjustment, as discussed in Section 4.4.

Under this option, if the utility’s actual weather-normalized MWh load reported in target year 20XX (adjusted to be net of fuel switching) fall at or below the MWh load target that was set in advance for that year, then the utility has met or exceeded the energy efficiency performance target.

Here, the sales forecasting approach is comparable to that used in utility rate cases. However, we expect that there is significant variation among NYS utilities with respect to their rate case forecast models. To minimize the opportunity for gaming, a uniform set of baseline forecast models – i.e., using a consistent set of variables for each customer sector and the same number of years of historical data across utilities – could be used. We also note that some amount of naturally occurring energy efficiency would be built into the forecast based on historical usage trends. Furthermore, there is some uncertainty in the magnitudes and timing of historical energy efficiency used to reconstitute the baseline.

Overall, precision is a significant challenge with respect to utilizing a “top-down” econometric sales forecast in setting a performance target for energy efficiency in this manner. DPS and National Grid analysts cited a confidence interval of +/- 3% as being typical for load forecasts even one or two years out, suggesting that a (for example) 2% load reduction from energy efficiency activities may fall within the margin of error. This approach also would not make ex-post adjustments for economic variables that may in fact diverge from those used in the forecast model.

National Grid analysts questioned whether top-down econometric models could in fact disentangle, with a sufficient degree of accuracy, the aggregate MWh reduction attributable to energy efficiency in light of the multiple factors driving electricity load. They suggested that for the National Grid service territory, doing so is likely to become more feasible within the next five years as National Grid develops more sophisticated hierarchical forecasting models and data analytic capabilities in order to integrate increasing levels of DER penetration into its system planning.

### *4.3.2.2 Comparing Actual Normalized Sales to a Pooled Baseline Prediction Model.*

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The second option considered would use pooled econometric prediction models, agreed upon upfront, to estimate MWh delivery volume “baseline predictions” over time without energy efficiency adjustments. For an outcome-oriented consumption metric for target year 20XX, the agreed upon model would then be re-estimated using actual year 20XX data for the independent variables that are included in the model. The difference between the baseline prediction MWh and the actual model-normalized MWh volumes in year 20XX – i.e., normalized using parameters from the agreed upon prediction model – would provide the measurement of the aggregate MWh attributed to energy efficiency savings.

Under this approach, a single model for each major customer sector would be estimated using data on electricity consumption and consumption trends (potentially including penetration trends for DERs other than energy efficiency), customers, and economic data, with data gathered from publically available sources and directly from utilities. Again, some amount of naturally occurring energy efficiency may be built into the model based on historical usage trends. The pooled, cross sectional (i.e., using data from all six utilities), time series (i.e., data spanning from the early 1990s to the present) model would be used to predict MWh delivery volumes for each utility. Since weather and economic variables specific to each utility’s service area would be included as independent variables in the pooled model, the comparison between predicted and actual MWh in the target year 20XX for that utility would reflect normalization for weather and economic variables that otherwise may have diverged if a forecast model approach was used instead of an explanatory model.

This pooled econometric modelling approach also would directly calculate the confidence intervals for predicted utility electricity sales, allowing for assessment of whether the magnitude of load reduction that is expected to result from energy efficiency falls within the margin of error. However, as was the case for the sales forecasts noted above, initial prediction models developed by DPS Staff economists suggest that such models may produce similarly imprecise estimates of sales.

### *4.3.3 “Top-Down” Macroeconomic Modeling Evaluation*

The Working Group additionally considered the applicability of top-down macroeconomic modeling methodologies that comprise a relatively new approach in the energy efficiency evaluation literature. These models aim to measure net changes in energy consumption over time across an entire customer sector that are attributable to aggregate energy efficiency activity in that sector. To date, pilot analyses have been conducted in California and in Massachusetts.<sup>40</sup> Overall, these methodologies are

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<sup>40</sup> GL and NMR, (March 31, 2015), Massachusetts Electric and Gas Program Administrators, Tetra Tech, NMR Group, Inc., and DNV GL, retrieved from <http://ma-eeac.org/wordpress/wp-content/uploads/Top-down-Modeling-Methods-Study-Final-Report.pdf>. Russel, C., Ucar, F., et. al, (2015), The View from the Top: Top-Down Estimation of Program Savings Using Utility-Level Data in Massachusetts, NMR Group, retrieved from [http://www.nmrgroupinc.com/wp-content/uploads/2015/07/Russell\\_et\\_al\\_The\\_View\\_from\\_the\\_Top.pdf](http://www.nmrgroupinc.com/wp-content/uploads/2015/07/Russell_et_al_The_View_from_the_Top.pdf). Stewart, J., Haeri, H., (October 2012), CPUC Macro Consumption Metric Pilot Study, The Cadmus Group, Inc., retrieved from [http://www.calmac.org/publications/Cadmus\\_Macro\\_Consumption\\_Metric\\_Pilot\\_Study\\_Final\\_Report\\_19OCT2012.pdf](http://www.calmac.org/publications/Cadmus_Macro_Consumption_Metric_Pilot_Study_Final_Report_19OCT2012.pdf). Horowitz, M., (November 2012), Macro Consumption Metrics Pilot Study Final Report, Demand Research LLC, California Public Utilities Commission Energy Division, retrieved from [https://www.researchgate.net/publication/271502126\\_Macro\\_Consumption\\_Metrics\\_Pilot\\_Study\\_Final\\_Report\\_to\\_the\\_CPUC](https://www.researchgate.net/publication/271502126_Macro_Consumption_Metrics_Pilot_Study_Final_Report_to_the_CPUC).

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viewed as promising but still experimental. The Working Group does not consider this macroeconomic modeling approach to be appropriate for establishing an EAM metric and target because it uses ex-post analysis with fairly intensive data requirements, including a long time series of data (ideally 10+ years) on energy efficiency spending (or other variable for activity) at a geographically granular level. Further, the analyses examined typically have sought to verify energy efficiency achievements through programmatic activity (measured by programmatic spending) and not to develop an outcome-oriented metric that effectively captures all energy efficiency activity, including programmatic and market-initiated activity consistent with the State’s policy direction. Net MWh reduction estimates moreover have tended to have wide error bands, or have failed to find statistically significant results in any sector, especially in the commercial and industrial sector.

### 4.3.4 Further Analysis is Needed

Further analysis is clearly needed with respect to appropriate econometric methodologies. Subsequent analysis should include investigation of whether coefficient estimates derived from an econometric model could be used in setting an outcome-oriented energy efficiency target, a procedure which is expected to result in a tighter confidence interval.<sup>41</sup> [THE WORKING GROUP HAS NOT YET HAD TIME TO DISCUSS THE FOLLOWING, BUT EXPECTS TO DO SO PRIOR TO FINALIZING THE REPORT: Additionally, the focus of our Working Group’s investigation to date has been an outcome-oriented metric and target for energy efficiency, consistent with our Working Group Scope. There may be merit in considering outcome-oriented metrics and load reduction targets that do not attempt to disaggregate energy efficiency from other behind-the-meter load modifiers, including distributed generation.]

### 4.4 Adjustments to Account for Fuel Switching

The Working Group further recommends that the Commission design and implement a mechanism to account for fuel switching, which encompasses “good load.” Because fully accounting for fuel switching is a complex endeavor, we recommend that mechanisms to account for fuel switching be phased in incrementally. Initially, the most impactful forms of fuel switching can be tracked and an adjustment to the outcome-oriented energy efficiency metric can be applied (ex-post) to ensure that utilities are not discouraged from taking actions to facilitate the electrification of end-uses that have traditionally been powered by fossil fuels. This “environmentally beneficial electrification”<sup>42</sup> or “good load” should be incentivized, not discouraged.

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<sup>41</sup> For example, further analysis could explore an approach that would set outcome targets based upon the improvement in a trend coefficient estimated on weather normalized per-customer residential kWh. The further analysis would involve (1) developing a consistent method of weather normalizing residential kWh for all utilities, (2) determining the appropriate confidence level of the trend coefficient estimated on those weather normalized kWh, and (3) setting incentive targets based upon increasing levels of confidence that an improvement in the trend coefficient occurred in each year.

<sup>42</sup> See Dennis et al., *Environmentally Beneficial Electrification: The Dawn of ‘Emissions Efficiency’*, The Electricity Journal 29 (2016), at 52.

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Additional analysis is needed to assess whether or not an outcome-oriented metric is likely to meaningfully incentivize fuel switches away from electricity that may increase total carbon emissions or other forms of pollution. If so, further attention to fuel switching away from electrified end uses is warranted.<sup>43</sup> In the longer-term, moving to a fuel-neutral metric that tracks total energy or emissions changes within a utility service territory also merits consideration.

[THE WORKING GROUP HAS NOT YET HAD TIME TO DISCUSS THE FOLLOWING, BUT EXPECTS TO DO SO PRIOR TO FINALIZING THE REPORT: Some Working Group members observed that, without adjustment for fuel switching away from electrified end-uses, a consumption-based outcome-oriented metric would credit such fuel switching in the exact same manner as load reductions caused by energy efficiency, despite the fact that the non-electrified end use could still create emissions. Working Group members are not sure the degree to which this poses a significant problem, and are still discussing whether and how the potential for such fuel switching might be addressed. The Working Group is currently considering whether and how a procedural framework might be set up to identify such load switching, and how targets might be adjusted to account for the potential of such fuel switching.]

### 4.4.1 The “Exemption” Approach

The simplest way to prevent discouragement of beneficial electrification is to exclude load changes arising from fuel switching from the outcome-oriented targets. Implementing such an exemption requires (1) developing criteria regarding what forms of fuel switching will be exempted in this manner (2) tracking load arising from such fuel switching, and (3) accounting for that load in the target setting and performance assessment process.

In theory, a comprehensive exemption to eliminate all inappropriate incentives and disincentives that would otherwise arise from the establishment of the outcome-oriented metric would track all fuel switching away from electricity, and would track any form of new “good load,” defined as any new load for which the carbon emissions from the electrified end use are lower overall than the carbon emissions would be if the end-use were not electrified. This calculation would involve three key components: (1) the fuel source and efficiency of the end-use being switched away from; (2) the efficiency of the electrified end use; and (3) the generation mix supplying power to the electrified end use.

But because any load changes from fuel switching need to be tracked and accounted for, it is only prudent to track and exempt load where the benefits of aligning incentives more than outweigh the administrative costs of establishing and administering the tracking mechanism. Relevant factors for determining whether any given type of fuel switching should be tracked in this manner include: (1) the degree to which the type of fuel switching is currently taking place and is expected to take place in the future; (2)(a) the degree to which the electrification of a given end use is beneficial (i.e. reduces total emissions) or (b) the degree to which a fuel switch away from an electric end use causes new emissions; (3) the ease with which a tracking mechanism can be established; and (4) the accuracy of such a tracking

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<sup>43</sup> Even where switching fuels away from electricity reduces total emissions, it may not be viewed as equivalent to an emissions *eliminating* activity such as energy efficiency. The Working Group did not have the opportunity to discuss switching fuels away from electricity at any length.

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mechanism. We recommend that exemptions be developed through holistic assessment and rough calculation of these factors rather than getting bogged down in the details of each one. The Commission’s BCA Order, which outlines specific steps for applying the Societal Cost Test to various DER technologies, is a starting point for assessment of the impact of fuel-switching technologies.

In the near term, a significant advantage of an exemption approach is that because it does not create any affirmative incentives associated with fuel switching and instead merely ensures that outcome-oriented efficiency targets will not themselves incent the exempted types of fuel switching, it should work seamlessly with any separate incentive programs that may be adopted with regard to such technologies. For instance, if the Commission were to establish a “TREC” requirement applicable to geothermal heat pumps,<sup>44</sup> or a separate EAM associated with electric vehicles, either would be able to operate seamlessly with an exemption from the outcome-oriented energy efficiency metrics.

### *4.4.1.1 Identifying Types of Fuel Switching to be Exempt from the Efficiency Targets*

The primary sources of “good load” were identified by the Commission in its Order adopting the Clean Energy Standard: electric vehicles and heat pumps. We believe it is appropriate to initially focus on these technologies. In the CES Order, the Commission ordered the development of a “mechanism for monitoring . . . penetration” of those technologies.<sup>45</sup> For each technology, parameters will need to be developed to determine what exact uses qualify. Defining electric vehicles is a relatively straightforward exercise. The category should include any vehicle that runs at least partially on electricity, including “plug-in hybrids.” [ADDITIONAL DEFINITION FOR HEAT PUMPS IS UNDER CONSIDERATION. POTENTIAL STEPS TO IDENTIFY FOCAL TYPES OF FUEL SWITCHING AWAY FROM ELECTRICITY IS UNDER CONSIDERATION.]

### *4.4.1.2 Tracking Fuel Switching and Accounting for it in the Target Setting Process*

For “good load,” we recommend that outcome-oriented energy efficiency targets be set in a manner that assumes no load from electric vehicles or beneficial heat pumps.<sup>46</sup> In the near term, this should not present a problem because as found in the Clean Energy Standard Order, these sources do not yet constitute a significant fraction of the state’s load. Setting the targets without reference to these sources of load in the long-term will give the utilities a natural incentive to ensure that processes for tracking and accounting for this load are established as soon as possible, before they begin to significantly impact utility achievement of outcome-based energy efficiency targets. Excluding “good load” further removes a source of uncertainty in the target setting process, since it may be difficult to accurately predict how quickly EVs and heat pumps will be adopted.

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<sup>44</sup> To be investigated pursuant to the Clean Energy Standard Order, *see* Case 15-E-0302, Order Adopting a Clean Energy Standard, at 83 (Aug. 1., 2016).

<sup>45</sup> Case 15-E-0302, Order Adopting a Clean Energy Standard, Appendix F at 3 (Aug. 1., 2016).

<sup>46</sup> If no exemption for good load is implemented, then targets must be set in a manner that accounts for the anticipated good load from these sources. The Clean Energy Standard White Paper, which assumes 8,615 GWhs of EV and thermal heat pump load, is a useful data point.

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Assuming that actual (normalized) load is used for purposes of measuring achievement of the outcome-oriented targets, an ex-post adjustment will need to be made to subtract load from EVs and heat pumps for purposes of assessing achievement towards those targets. Absent meter data that specifically tracks load from these technologies, this adjustment process will require estimating the load from those sources.

Currently, at least two processes have been set in motion to develop methodologies for tracking load from EVs and heat pumps. First, as discussed above, the Clean Energy Standard orders the development of a mechanism for monitoring EV and heat pump penetration. In addition, through the electric vehicles Distributed System Implementation Plan engagement group, stakeholders are examining mechanisms to forecast and monitor EV penetration. We recommend that the Commission take steps to ensure that these processes inform one another and are not duplicative, and to ensure that these tracking mechanisms are designed in a manner that facilitates the operation of an exemption to outcome-oriented efficiency metrics. [WORKING GROUP MAY FURTHER CONSIDER WHETHER TO RECOMMEND A PROCEDURAL FRAMEWORK FOR SUCH TRACKING MECHANISMS.]

A decision must be made as to whether to track and account for only those load shifts that arise from utility and NYSERDA programs that incent “good load” and fuel switching away from electrified end uses, or whether to track the total amount of changes in load arising from these activities. It is sensible to consider making this determination on a technology-by-technology basis, considering both the feasibility of tracking and the potential for utility actions other than programs to incent such fuel switching. We anticipate that for electric vehicles, it will be possible and desirable to estimate market-wide penetration. For other technologies, including heat pumps and load switching away from electrified end-uses, it may be most feasible to track and account only for load shifts arising from utility and NYSERDA programs.

### 4.4.2 Tracking Total Energy Usage or Total Emissions

In time, the Commission may wish to consider moving from a metric that assesses electric load only to a unified metric that applies equally to other forms of fuel. Unlike the exemption approach, such a unified metric would credit different types of fuel switching differently, according to the outcomes they produce. Following a preliminary discussion of how such a unified metric might be established, the Working Group recognized that this is a complex topic that requires much further thought and analysis; it is not feasible to offer recommendations at this time.

Several considerations may complicate the development of an outcome-oriented metric that measures total energy use or energy intensity, or relatedly, carbon emissions intensity. First, there is no direct overlap between utility electric, gas and steam service territories; moreover, fuels such as heating oil are not delivered by regulated utilities. Thus, challenges may arise in collecting and attributing the relevant energy consumption data by utility service territory. Relatedly, it is necessary to identify the energy usage or emissions that will not be tracked for a utility-specific metric; for instance, most emissions from agriculture might be excluded. Finally, creating a unified metric requires additional methodological decisions. As noted in section 3.3.2, total energy can be defined in terms of *delivered*

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energy or *primary or source* energy. For a metric based on carbon emissions, meanwhile, one must decide upon the most appropriate emission conversion factors.

The Working Group has not yet investigated the adoption of gas efficiency targets on an outcome-oriented basis. We may revisit the possibility of establishing a unified metric, which would apply across electricity and fuel use, in recommending next steps to analyze and develop energy efficiency metrics and targets that apply to fuel savings.

## 5. EAM Structure and Terminology

As set forth in the REV Track II Order, the Commission noted that most EAMs “can be constructed as some variation on a line or other geometric function that links increasing performance to increasing reward.”<sup>47</sup>, but the Commission notes that “a linear slope for performance awards, with ceilings and floors reflecting a reasonable range of desired outcomes [...] is the preferred approach.”<sup>48</sup> We agree that the EAMs linked to energy efficiency outcomes should be designed in this manner, rather than using simple pass/fail incentive mechanisms with abrupt cutoffs. We also agree that the EAMs should be designed with “ceilings and floors reflecting a reasonable range of desired outcomes.”<sup>49</sup>

### 5.1 Definitions

We envision an approach that establishes performance incentives that are linked to a range of outcomes. Such an approach, raises questions regarding the meaning of the term “target” in the context of setting goals to inform the establishment of efficiency EAMs. The term could conceivably mean (i) the base level at which utility shareholders begin to earn incentives, (ii) the maximum level, above which no additional incentives are awarded, (iii) the midpoint between these two outcomes, or (iv) a pre-designated “100% target” which may or may not lie at the midpoint of the minimum and maximum outcomes at which rewards are accrued.

To avoid confusion, we recommend that the Commission adopt a consistent set of terms to describe its performance targets and their associated EAMs. We have used the following terms in our report to describe various outcomes to be linked to the EAMs:

- “Minimum achievement level”: the point at which EAMs begin to be accrued;<sup>50</sup>
- “Maximum earnings threshold”: the point above which no further rewards can be earned, if applicable;
- “100% target” or “target”: a pre-designated point between the minimum achievement level and maximum earnings threshold that may or may not lie at the midpoint between these two points.<sup>51</sup> When formulating a positive-only EAM, establishing a “target” is not strictly necessary. Nevertheless, doing so is useful so as to establish expectations of the utility and to avoid

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<sup>47</sup> At 69.

<sup>48</sup> At 70.

<sup>49</sup> Id. at 70.

<sup>50</sup> In its Track II Order, the Commission specified that new EAMs should be positive-only. If, in the future, EAMs are adjusted to be symmetrical, the “minimum achievement level” should continue to describe the level at which the EAM applies in a positive or negative fashion.

<sup>51</sup> Should fully symmetric EAM be adopted, the 100% target would be at the inflection point where the incentive switches from negative possible. It is possible, however, to set an EAM that includes negative performance levels for which the 100% target does not lie at this inflection point (e.g. if the Commission determines that a utility should earn rewards even if it falls somewhat short of the 100% goal, but should be penalized if it misses the target by a wide margin).

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ambiguity that would otherwise be created surrounding whether the “target” is the minimum achievement level, the maximum earnings threshold, or the midpoint between the two.<sup>52</sup>

In recommending this terminology, with the exception of the 100% target, we have consciously avoided framing these lines in terms of utility goals. This is because it may be desirable to set the maximum earnings threshold at a level beyond even any reasonable “stretch goal” for utilities, so as to avoid a situation where a utility no longer receives incentives for better performance in the unlikely event that it exceeds all expectations. Conversely, a minimum achievement levels may be set lower than expectations in order to ensure that a utility retains an incentive to perform even if results are different than anticipated. We identify this possibility so as to make clear that the minimum and maximum levels for the EAM may be distinct from goals.

### 5.2 Slope of the Line

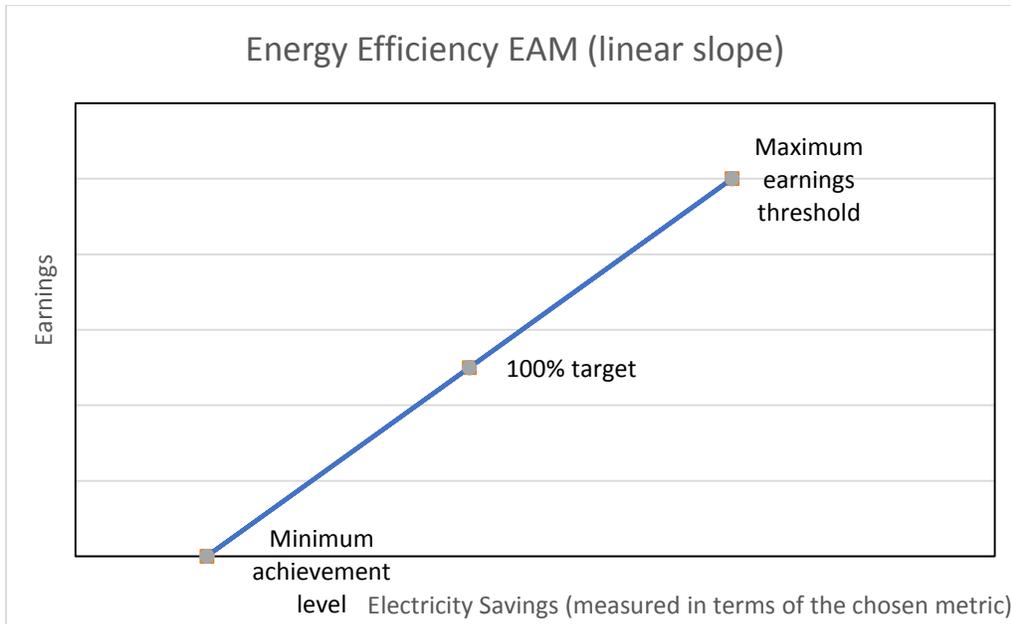
Assuming that the EAM is set in this manner, a decision needs to be made regarding how performance incentives will be awarded between the minimum achievement level and maximum earnings threshold. While there are myriad possible ways to structure the incentive, we discuss three particularly likely options here: (i) a linear slope; (ii) a two-tiered EAM with a steeper slope after 100% achievement; and (iii) a quadratic function.

#### 5.2.1. Linear Sloped EAM

The simplest way of structuring an EAM is to award incentives according to a straight line slope between these two points:

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<sup>52</sup> The term “target” should not be used to describe the minimum achievement level and maximum earnings threshold, as this will inevitably cause confusion.



Perhaps the most appealing feature of the linear sloped EAM is its simplicity. Under this structure, a utility would earn the same amount of incentive for any amount of energy savings between the minimum achievement level and maximum earnings threshold, regardless of where along the line the results in the utility’s service territory fall. This ensures that the utility will receive a consistent incentive to save electricity across a range of potential outcomes.

This simple linear structure easily facilitates annual earnings accrual, should the Commission choose to allow recovery on that basis.<sup>53</sup> Under such a structure, the Commission could set annual “100% targets” for a utility, paying the utility each year based on achievement against that annual target.

So long as the utility is on track to fall within the minimum achievement level and maximum earnings threshold for each annual period and the slope of the line is held constant from year to year, utility shareholders would receive the same monetary incentive for savings achieved in any year. The Commission could, for example, set a constant slope for a utility’s EAM for a given multi-year rate case period, and then allow recovery on an annual basis. Assuming that some of the savings were driven by a utility’s ETIP or through a portfolio of utility energy efficiency programs funded in the rate case context, the constant nature of the incentive would allow for the Commission to be flexible in providing the utility a given pool of funds to be spent in any year. Should an unforeseen delay arise in administration of a given energy efficiency program, the utility could carry out the same program the following year using the funds allocated in year 1, in addition to whatever set of funds were earmarked for year 2 programs. A utility thereby could be afforded the opportunity to “catch up” should it miss savings in a given year.

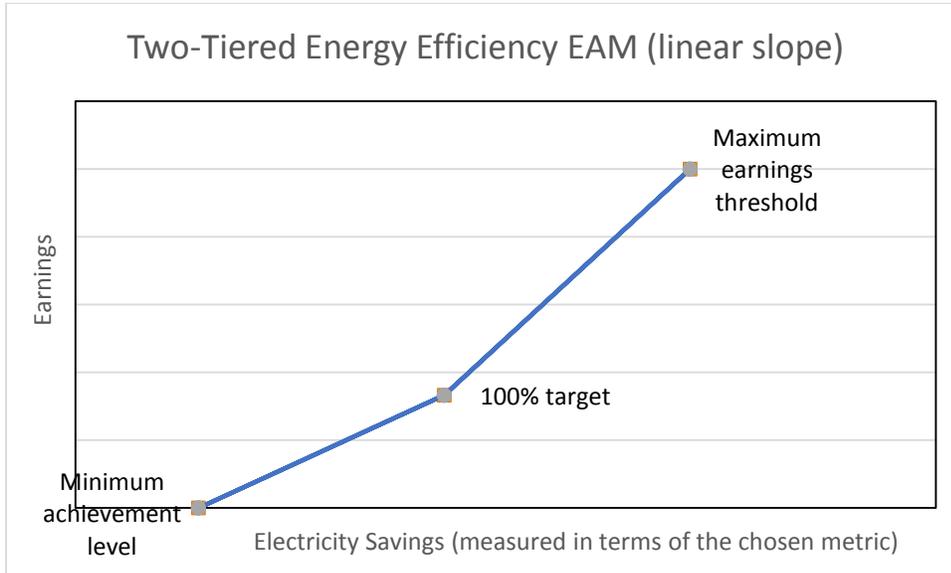
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<sup>53</sup> [provide note that we don’t necessarily endorse annual earnings accrual; discussion of that concept provided in section x (if we end up discussing it)]

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## 5.2.2 Two-tiered EAM

Under a two-tiered EAM structure, utility shareholders would earn incentives at a higher rate once the 100% target is surpassed:



As shown in the above graph, a two-tiered structure rewards utility shareholders more for achievements above the 100% target. This structure may be appropriate if (i) a significant amount of the savings being achieved are driven through a utility’s ETIP, or through energy efficiency programs administered by the utility and/or NYSERDA; and (ii) a fixed amount of funding is available for those programs. The 100% target for a two-tiered EAM should be set at a level reflecting anticipated savings to be achieved through 100% program spending.

Under these conditions, a utility will not yet have achieved the 100% target under two conditions: (i) the program budgets are not yet fully spent (in which case additional savings should be relatively easy to achieve by spending the remaining allocated funds, or in the case of NSYERDA, a utility facilitating expenditure of those funds); or (ii) all program funds have been spent (in which case the utility will have performed below expectations either in administering/facilitating programs, or will have achieved fewer savings through non-program related activities than expected. In this second case, lower shareholder returns are justified because electricity savings will not have been achieved in as cost effective a manner as expected. By contrast, savings above the 100% level are harder to come by. These savings reflect particularly cost-effective administration of programs, or other activities that have achieved savings without any additional program funding. In these cases, higher awards are justified.

This two-tiered structure may be less well-suited to being divided into annual targets or annual earnings accrual. This is because the elbow-like nature of the earnings could provide an incentive for the utility to concentrate savings into specific years so as to beat the 100% target in a given year and earn incentives at a higher rate. At the same time, this should not be a large problem so long as targets for later years are set in a manner that builds upon the target from the earlier year. In other words, so long as the

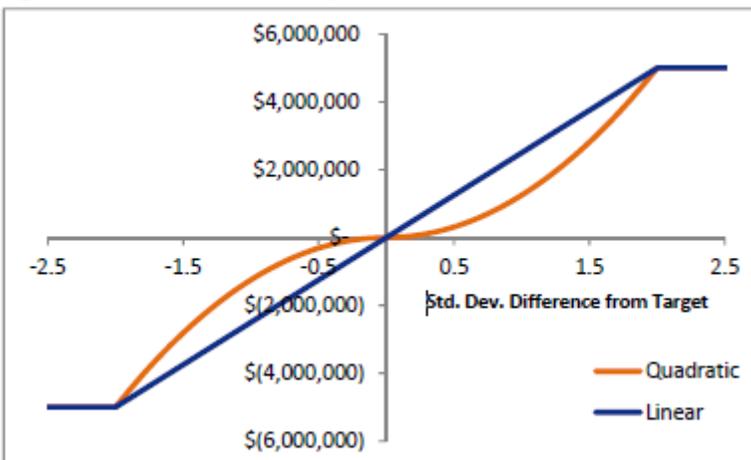
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Commission frames the target for each year in terms of total load or an energy intensity metric that does not account for savings achieved in that particular year, withholding spending in year 1 will have little benefit in year 2, because savings from year 1 actions will be reflected in year 2's load just as savings from year 2 actions would be. While, in using an elbow-shaped EAM, it would be inadvisable to make a pool of funds available to a utility to be spent in any year of a multi-year period because the utility could then spend all of the funds in year 1 in an attempt to receive the greater incentives above the 100% target for that year, the Commission could still allow for funds to be carried over from year 1 to year 2 for the utility to "catch up," because the lower savings in year 1 will have handicapped the utility and it will need to administer those programs simply to get to where it would have been had it administered the programs in year 1.

### 5.2.3 Quadratic Function EAM

Quadratic function EAMs are discussed in *Utility Performance Incentives: A Handbook for Regulators*.<sup>54</sup> Quadratic (also called 'parabolic') functions provide increasing rewards or penalties as achievement deviates from the 100% target. The quadratic function recognizes that as results deviate more from this target, savings achievements are correspondingly more impressive (or underwhelming, in the case of underachievement). Massachusetts grants performance incentives according to a quadratic function.<sup>55</sup> Synapse's illustration of a quadratic function is provided below<sup>56</sup>:

Figure 6. Quadratic Function Compared to a Linear Function



<sup>54</sup> Synapse Energy Economics Inc. (March 9, 2015), at 43.

<sup>55</sup> Id.

<sup>56</sup> Id. at 44.

## 6. Proposals for Setting and Achieving Energy Efficiency Targets

[SUBSTANTIAL ADDITIONS TO SECTION 6 WERE MADE DURING THE REVIEW PERIOD AND REMAIN UNDER ACTIVE REVIEW BY WORKING GROUP MEMBERS.]

Members of the Working Group agreed on the value of recommending a trajectory of system-wide electric energy efficiency targets for 2017 to 2030. Members diverged, however, as to the appropriate approach for setting energy efficiency targets at the state level and for each of the state's utilities. In this section, we therefore describe options for target setting rather than a consensus recommendation.

We recognize upfront that in order to develop an outcome-oriented EAM for energy efficiency, the specified EAM target needs to define the level of utility performance as measured by the EAM metric. Yet in this instance additional work is required to specify the metric itself. It is thus premature to propose specific EAM targets in this report. The discussion of target setting that follows is focused on statewide energy efficiency achievement.

This section further discusses factors that could enable, or could put at risk, the increase in system-wide energy achievement needed to reach state policy goals. Working Group members acknowledge the opportunity of having both resource acquisition programs and market animation and market transformation activity as complementary tools. The majority of Working Group members find that in the near-term, the Commission should advance new opportunities for directing funds to mechanisms to facilitate greater investments in energy efficiency, including established utility programs and, to the extent feasible, new REV market mechanisms.

### 6.1 Options for Developing a Trajectory of Energy Efficiency Targets

In general, in this section statewide energy efficiency achievement is discussed in terms of weather-normalized electric load reduction, in gigawatt hours (GWhs), relative to the NYISO statewide electric energy econometric forecast (which is unadjusted for new DER). Consistent with this report's focus on an outcome-oriented approach, we anticipate that programmatic and policy interventions and market-initiated activity all would factor into the establishment and measurement of electric efficiency savings targets and achievement.

We further emphasize that the long-term trajectory of targets discussed in this section should be considered indicative levels of achievement toward the state's clean energy goals. The Working Group supports a process to periodically re-evaluate energy efficiency targets, consistent with the approach that will be used in setting CES targets for renewables.

One approach considered by the Working Group is to set a minimum statewide achievement level that is benchmarked against the levels of energy efficiency assumed in the Clean Energy Standard Order, such that between 2016 and 2030 the state reaches or exceeds the 35,627 GWh of additional energy efficiency that is assumed in that Order. Whereas the 2016 Staff White Paper on Clean Energy Standard assumed a constant level of energy efficiency savings annually to 2030, in discussions to date Working

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Group members have allowed for a non-linear trajectory of minimum energy efficiency achievement over the 2016-2030 period that reflects greater energy savings in the later years. This modest “backloading” of achievement is intended to reflect NYSERDA’s recent shift to focus on longer-term market animation and transformation strategies, and the related potential to increase market-initiated energy efficiency to the extent that existing market barriers are mitigated. Some Working Group members also believe that the backloading is appropriate considering that it helps to reduce, although not eliminate, the potential gap between energy efficiency savings outlined in the non-linear trajectory and the likely savings expected from all sources in the short-run based on current energy efficiency program funding levels and market expectations (see Section 6.2).

A second approach is recommended by Working Group members including Acadia Center, Alliance for Clean Energy New York, Association for Energy Affordability, Inc., CLEAResult, Lime Energy, Natural Resources Defense Council, Pace Energy & Climate Center, Sealed, and TRC Solutions – collectively, the “Efficiency Ramp Up Advocates.”<sup>57</sup> Referred to herein as the “Efficiency Ramp Up Strategy,” this approach is to set near-term targets by ramping up annual incremental energy efficiency at a reasonable rate to match levels achieved in other leading states. This approach accounts for the fact that other states do not use the outcome-based approach recommended herein, and accordingly translates similar target levels into the context of outcome-based targets. Long-term targets (out to 2030) would be set based on an energy efficiency potential study that would be divided by utility service territory and would incorporate market initiatives developed over time under New York’s REV policy framework. A new energy efficiency potential study would be commissioned once every three years and used as a means to adjust these long-term targets. For the purposes of utility EAMs, minimum achievement levels and maximum earnings thresholds would be set based on a realistic range of outcomes on either side of the 100% targets established, to provide for reasonable assurance that utility shareholders would be incented to achieve better energy efficiency outcomes.

The Joint Utilities also generally support the ramp up of energy efficiency although they do not endorse the specific ramp up rate as described in this report. The Efficiency Ramp Up Advocates and the Joint Utilities view the targets as achievable through ramping up of successful of energy efficiency investments and adequately funded programs.

### [6.1.1 Benchmarking Statewide Minimum Energy Efficiency Achievement against CES Assumptions and State Energy Plan Efficiency Goals](#)

Consistent with the most recent New York State Energy Plan, in August 2016 the Commission adopted a Clean Energy Standard (CES) which mandates the State Energy Plan goal that 50% of New York’s electricity is to be generated by renewable sources by 2030, as part of a strategy to achieve a 40% reduction in greenhouse gas emissions from 1990 levels by 2030.<sup>58</sup> The load forecasts used to set CES renewable procurement targets (initially for the years 2017 through 2021) account for incremental electric

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<sup>57</sup> NTD: Due to the tight time frame under which this draft was developed, not all working group members have yet had a chance to evaluate the proposals put forth herein by the Efficiency Ramp Up Advocates and accordingly more working group members may join this group prior to finalization of this report.

<sup>58</sup> Cite CES Order

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energy efficiency savings that sum to 35,627 GWhs by 2030, a level of achievement that also is consistent with the State Energy Plan energy efficiency goal.

To develop a trajectory of energy efficiency targets in alignment with State energy policy goals, the Working Group therefore considered the approach of setting minimum statewide energy efficiency achievement levels, on an annual or a multi-year basis, that cumulatively summed to at least 35,627 GWhs by 2030. The Working Group did not reach agreement (using this approach or any alternative method) on a level of energy efficiency that would represent a “100% target” for statewide achievement.

Specific steps taken to calculate an illustrative trajectory of statewide minimum energy efficiency achievement levels follow:

1. The CES energy efficiency assumption subtracts 2,227 GWhs annually over the 2015-2030 period from the 2015 NYISO Econometric forecast (unadjusted for DER).<sup>59</sup> Since the State’s EEPS 2 energy efficiency programs were administered through 2015, we re-scaled the linear CES benchmark assumption to be approximately 2,375 GWhs of energy efficiency savings annually over the 2016-2030 period.
2. Rather than propose a trajectory of cumulative GWh savings based on linear year-over-year savings, we allowed for modest “backloading” of energy efficiency achievement. This decision is intended to reflect NYSERDA’s recent shift to focus on market animation and transformation, which emphasizes longer-term strategies to address barriers to market adoption of energy efficiency (rather than near-term procurement of efficiency savings). In this scenario, efficiency gains from unsubsidized market activity are expected to make up an increasingly significant portion of the total energy efficiency achievement over time.
3. The resulting minimum statewide energy efficiency achievement levels correspond to the cumulative GWh reduction in wholesale sales shown in Figure X below, relative to the 2015 NYISO Econometric forecast for the 2016-2030 period (extrapolated as in the CES Order). Following this trajectory, the annual incremental electric efficiency savings would meet or exceed approximately 1.0% of the unadjusted forecasted sales, on average, over the 2016-2020 period;<sup>60</sup> 1.5% of the unadjusted forecasted sales in each year from 2021-2025; and 1.7% of the unadjusted forecasted sales in each year from 2025-2030.
4. The Working Group further allocated the statewide minimum energy efficiency achievement levels to utility service territory across the State’s investor owned utilities and LIPA. This

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<sup>59</sup> This energy efficiency assumption was based on approved ETIP and CEF targets, increased pro rata to include NYPA, LIPA, and direct NYISO customers.

<sup>60</sup> It is important to note that under this trajectory, the 2017 policy target incorporates cumulative energy efficiency savings over the 2016-2017 period, an assumption intended to account for the potential shift toward an outcome-oriented metric for measuring energy efficiency at the same time that NYSERDA’s program portfolio is under transition. Thus, over the five-year period of 2016-2020, energy efficiency accounts for just over a 5% incremental reduction in wholesale sales relative to the NYISO econometric forecast. The annual incremental electric savings is 1.3% for 2018, 2019, and 2020.

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allocation was based on assigning each utility a proportion of the statewide GWh reduction level equivalent to its proportion of total 2014 electricity sales summed across the relevant utilities from the most recent sales data available from the U.S. Energy Information Administration (EIA-861 dataset).<sup>61</sup> The Joint Utilities consider this method of allocation across service territories inappropriate, as discussed in Section 6.1.3, although some Working Group members found it to be a reasonable first approximation.

5. NYPA was not assigned a proportion of the statewide GWh reduction. Rather, under this approach NYPA’s energy efficiency activities are assumed to contribute to the aggregate load reduction in the utility service territory where each NYPA customer is located, to promote cooperation between the distribution utility and NYPA in assisting customers to pursue clean energy solutions. Likewise, NYSERDA’s energy efficiency activities are assumed to contribute to achievement in each utility service territory.
6. Appendix B shows that on a statewide basis and across the indicative (first approximation) allocation to each utility service territory, the 2030 minimum energy efficiency achievement level derived through this approach is reasonably consistent with the achievable potential estimates from the NYSERDA 2014 Energy Efficiency and Renewable Energy Potential Study, and is significantly below the economic potential found in that study. This is intended to provide an order-of-magnitude comparison given that the majority of the State’s utilities do not have a current energy efficiency potential study available for their New York State service territory.

**Figure X: Minimum Statewide Energy Efficiency Achievement Levels, in Cumulative GWh**

Year	Minimum Statewide Achievement in Cumulative GWh	Re-scaled CES Linear Projection in Cumulative GWh	Year	Minimum Statewide Achievement in Cumulative GWh
2016	<i>incorporated into 2017</i>	2,375	2022	13,753
2017	2,139	4,750	2023	16,351
2018	4,279	7,125	2024	18,949
2019	6,418	9,501	2025	21,547
2020	8,558	11,876	2026	24,603
2021	11,155	14,251	2027	27,659
			2028	30,716
			2029	33,772
			2030	36,828

<sup>61</sup> U.S. Energy Information Administration (EIA). 2015. *Electric power sales, revenue, and energy efficiency Form EIA-861 detailed data file*. <https://www.eia.gov/electricity/data/eia861/>. See file “Sales\_Ult\_Cust\_2014.xls”.

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[REVIEW COMMENT: SECTION 6.1.1 NEEDS TO BETTER EXPLAIN THAT THE 2017 TARGET IS INCLUSIVE OF SAVINGS FROM 2016-2017.]

### 6.1.2 The Efficiency Ramp Up Strategy

[SUBSTANTIAL ADDITIONS TO SECTION 6.1.2 WERE MADE DURING THE REVIEW PERIOD, INCLUDING AN ADJUSTMENT TO THE METHODOLOGY FOR SETTING TARGETS MADE IMMEDIATELY PRIOR TO SUBMISSION OF THIS DRAFT. THIS SECTION REMAINS UNDER ACTIVE REVIEW BY THE WORKING GROUP.]

The logic behind the Efficiency Ramp Up Strategy proposed by the Efficiency Ramp Up Advocates is that under REV, New York should ramp up energy efficiency levels at least as fast as those being achieved in any other state in the country. This proposal holds that by 2030, New York should be able to achieve the amount of energy efficiency deemed achievable through a potential study that takes into account the potential for new REV market mechanisms. By ramping up as quickly as the most successful energy efficiency efforts from other jurisdictions as it implements REV, and by setting long-term goals that account for new REV policies, New York will position itself to become the national leader in this area.

In the view of the Efficiency Ramp Up Advocates, the Efficiency Ramp Up Strategy best reflects the Commission’s desire to set ambitious targets that drive achievement of the State Energy Plan and Clean Energy Standard goals by recognizing the critical role that energy efficiency can and should play in achieving those goals in a cost effective manner. The Commission recognized in the Clean Energy Standard Order that “[s]tudy after study has shown that when deployed well, energy efficiency is the cheapest and most cost effective manner to reduce carbon emissions in the energy sector.”<sup>62</sup> By facilitating as fast a ramp up in energy efficiency investment as has been demonstrated to be feasible, this approach will facilitate more cost effective achievement of both the State Energy Plan’s goal to reduce greenhouse gas emissions by 40% by 2030, and the Clean Energy Standard’s goal of achieving 50% renewable energy supply by 2030.

It is also important to note that the Joint Utilities, among other Working Group members, view these targets as achievable through ramping up of successful energy efficiency investments in the near term, such as those made by utilities’ adequately funded efforts to enable increased adoption of energy efficiency. From the standpoint of the Joint Utilities, the ramp up should be supported through adequate funding of existing utility energy efficiency programs because of the uncertainty of results from market transformation activities as well as an unclear magnitude of contribution to be expected from improved codes and standards.

The Efficiency Ramp Up Strategy thereby recognizes the Track 2 Order’s clear directive that energy efficiency targets be set in a manner designed to “reduce the cost of achieving these goals,”<sup>63</sup> and the Commission’s expectation, reflected in the Clean Energy Standard Order, that the target recommended by the Clean Energy Advisory Council should be *higher* than currently-existing energy

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<sup>62</sup> Clean Energy Standard Order, at 81-82.

<sup>63</sup> Track 2 Order, at 81-82.

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efficiency targets.<sup>64</sup> The Efficiency Ramp Up Advocates are deeply concerned that if the targets are instead indexed to the *current* targets, as would be the case in the CES Benchmarking approach articulated above, significant potential energy efficiency achievements will not be realized and achievement of the Clean Energy Standard and State Energy Plan greenhouse gas reduction goals will accordingly be significantly more costly than would otherwise be the case.

### 6.1.2.1 Determining an Achievable Ramp Up Rate for Annual Incremental Energy Efficiency

In the Efficiency Ramp Up Advocates' view, for purposes of setting both the 100% statewide energy efficiency target and 100% targets for individual utilities, an appropriate benchmark ramp up of annual incremental energy efficiency savings as a percentage of sales is 0.4% per year.

Data from numerous other jurisdictions suggest that annual increases of this magnitude are achievable. For example, an August 2015 Environmental Protection Agency report summarizing data from a group of 26 high-achieving program administrators found that the *average* annual energy savings increases amongst the group was 0.38%.<sup>65</sup> One program administrator was able to achieve a first-year savings increase of 1.28%.<sup>66</sup> We found numerous instances of utilities that have achieved ramp rates of roughly 0.4%, including utilities that, prior to ramping up achievement levels, realized very little energy efficiency savings. The following table, based on EIA data, provides some illustrative examples:

	Starting Point (est.)	Ending Point (est.)	Years	Average Annual Ramp
Eversource MA	1.35%	3.18%	5	0.37%
National Grid MA	1.34%	3.03%	5	0.34%
Fitchburg Gas and Electric Co.	0.20%	1.70%	4	0.38%
Western MA Electric Co.	0.50%	2.10%	4	0.40%
City of Anaheim	0.30%	1.10%	2	0.40%

Significantly, these ramp rates of 0.4% reflect savings driven only from utility-administered energy efficiency programs. New York's outcome-based targets, by contrast will be achievable through *any* actions that facilitate energy efficiency investments. Because under this structure a wider range of activities are able to drive achievement, the Efficiency Ramp Up Advocates think that even greater savings levels should be possible. Therefore, while 0.4% ramp reflects the upper end of program administrator achievement in other states, the Efficiency Ramp Up Advocates believe that it is reasonable and appropriate for this level of savings increases to be used to set the 100% target for each utility.

<sup>64</sup> Clean Energy Standard Order, at 82 (“The achievement of higher levels than the current energy efficiency targets can clearly benefit individual consumers and create system-wide value through the cost effective achievement of the RES and carbon reduction goals.”)

<sup>65</sup> EPA, Demand-Side Energy Efficiency Technical Support Document (Aug. 2015), at 81.

<sup>66</sup> *Id.*

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Maximum earnings thresholds that exceed these ramp rates will allow for utilities to earn higher incentives in the event that they are able to facilitate faster ramps by drawing upon the full range of tools at their disposal. The Efficiency Ramp Up Advocates and the Joint Utilities further believe the information in the table above shows the critical role that utility-run energy efficiency programs can play in achieving Clean Energy Standard objectives.

The Efficiency Ramp Up Advocates understand that New York is embarking upon a unique policy framework designed to drive unprecedented investments in energy efficiency, other states' programs nevertheless provide a benchmark against which New York's progress can and should be judged. New York's pioneering approach to setting outcome-based energy efficiency targets and developing market based mechanisms to incent private investment in energy efficiency ideally will enable the state to achieve even greater levels of energy efficiency in an even more cost effective manner. At the same time, if New York's policy framework is not able to provide at least as high of year-on-year gains in energy efficiency achievement as other states have already demonstrated is achievable, then it should be adjusted to provide for at least those levels of savings.

The Efficiency Ramp Up Advocates recognize that some market transformation efforts may require more time to yield results, and accordingly may not contribute significantly to ramping up New York's levels of energy efficiency savings in the near term. But in the Efficiency Ramp Up Advocates' view, this should not provide an excuse for failing to achieve energy efficiency savings in the near term, as the Commission can provide for utility-administered mechanisms to channel investment towards energy efficiency to make up for this gap. Long-term market transformation strategies and short term approaches to channel investments towards energy efficiency are not mutually exclusive and can be implemented in tandem. The Efficiency Ramp Up Advocates believe that such a strategy is necessary in the near term to achieve the Clean Energy Standard goals in as cost effective a manner as possible.

Using a 0.4% annual incremental ramp rate, we calculated illustrative 100% statewide targets for 2017-2019 under this approach by:

1. Beginning with the 2015 NYISO Econometric forecast (unadjusted for DER).
2. Assuming constant energy efficiency savings levels from 2015 to 2016.<sup>67</sup>

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<sup>67</sup> This assumption reflects the fact that it is too late to carry out any policy changes to achieve increased savings in 2016. In practice, if updated savings numbers are available at the time the Commission sets statewide targets, then actual savings numbers from 2016 could be used and a .4% annual increase in incremental savings percentage could be applied beginning with that number. To calculate an illustrative savings level for purposes of this report, we used the 2015 net incremental savings levels reported in the American Council for an Energy-Efficient Economy's 2016 State Energy Efficiency Scorecard (1,560 GWh), and scaled it up for line losses (to 1,681 GWh). *See* American Council for an Energy-Efficient Economy, The 2016 State Energy Efficiency Scorecard, at 28. This number is similar to NYISO's 2016 energy efficiency forecast (1,752 GWh). [NTD: working group members are discussing whether an issue remains as to whether in order to achieve the 2017 target, programs and other efficiency mechanisms would have had to be implemented in 2016. The exact methodology and illustrative targets may be adjusted in the final version of the Report to reflect this difference in outcome-based targets from traditional targets tied to savings attributable to specific programs.]

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3. Setting a 2017 savings target of 1.4% annual savings relative to this forecast. This target is roughly 0.4% above New York’s net incremental savings from 2015 (which was 1.05%, according to the 2016 State Energy Efficiency Scorecard released by the American Council for an Energy-Efficient Economy),<sup>68</sup> and is also roughly equal to the annual incremental savings assumed in the Clean Energy Standard Order.<sup>69</sup>
4. Increasing annual incremental savings levels by 0.4% per year thereafter.

[REVIEW COMMENTS INDICATE THAT SOME WORKING GROUP MEMBERS ARE CONCERNED ABOUT COMPARING ACHEIVEMENT ACROSS STATES WITHOUT LOOKING AT THE COST EFFECTIVENESS OF SUCH PROGRAMS. THE FINAL REPORT WILL INCLUDE DISCUSSION OF FURTHER ANALYSIS TO CONSIDER THE COST IMPLICATIONS ASSOCIATED WITH POTENTIAL ENERGY EFFICIENCY TARGETS.]

### 6.1.2.2 Setting Long-term Energy Efficiency Savings Goals

Under the Efficiency Ramp Up Strategy, long term savings goals to 2030 would be set based on a new energy efficiency potential study, to be carried out on behalf of NYSERDA. Because these long-term targets would inform the establishment of utility-specific EAMs, the potential study should assess the energy efficiency savings potential in each specific utility service territory. Further, in defining the amount of “achievable” energy efficiency, the study should take into account REV’s unique policy framework.

Once this energy efficiency potential study is carried out, annual incremental savings for years 2020 – 2030 can be calculated so as to set targets that equate to the amount of “achievable” energy efficiency potential through 2030.<sup>70</sup> These goals would be revised based on new efficiency potential studies conducted on a triennial basis. Each new efficiency potential study would be better informed as to the potential of REV market mechanisms, as REV implementation occurs.

The Efficiency Ramp Up Advocates are confident that the energy efficiency potential study to be conducted pursuant to the Efficiency Ramp Up strategy should lead to long-term savings goals that equate to a ramp up of .4% additional incremental energy efficiency savings per year until at least roughly 3% annual incremental efficiency savings is achieved. Massachusetts is already achieving roughly 3% annual incremental savings from energy efficiency programs alone, not even accounting for efficiency attributable to other actions.

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<sup>68</sup> American Council for an Energy-Efficient Economy, The 2016 State Energy Efficiency Scorecard, at 28.

<sup>69</sup> The Clean Energy Standard Order assumes 2,227 GWh of annual incremental savings, whereas 1.4% annual incremental savings equates to 2,321 GWh. *See* Clean Energy Standard Order, at 81.

<sup>70</sup> As set forth in the previous section, near-term targets (through 2019) should be set using the .4% ramp rate, as the total savings rate that would yield for 2019 of slightly more than 2% annual incremental savings is clearly feasible given that multiple states are already achieving significantly higher efficiency levels.

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The energy efficiency potential study conducted on behalf of NYSERDA by Optimal Energy, Inc., the American Council for an Energy-Efficient Economy, and the Vermont Energy Investment Corporation, indicated that there is enough economic energy efficiency potential such that the state would not achieve the full potential even if it increased annual incremental energy efficiency savings by .4% *every year* until 2030, all the way to roughly 6.5% annual incremental savings in 2030.<sup>71</sup> While the amount of achievable energy efficiency potential found by the study was significantly less, it was limited by several factors, including 1) it assumed savings could be achieved *only* through energy efficiency programs, rather than through other means such as improved building codes or market mechanisms to channel private investment; and 2) it did not measure the full achievable potential from all sectors.<sup>72</sup> Given that REV is designed to eliminate market barriers and the gap between ‘achievable’ energy efficiency potential and economic energy efficiency potential is defined by the amount unachievable due to these barriers, a new potential study should show significantly less separation between these amounts.

The Joint Utilities support the completion of bottom up potential studies. In their view, target-setting analysis can only be performed in an accurate manner with service territory specific data.

The significant cost saving potential of the Efficiency Ramp Up Strategy is supported by the conclusions of *Aiming Higher: Realizing the Full Potential of Cost-Effective Energy Efficiency in New York*, a Synapse Energy Economics Inc. report that examined the economic benefits of higher efficiency targets. Synapse concluded that “customers could save roughly \$3 billion in electricity costs between now and 2030 with higher efficiency savings targets of roughly 3 percent of annual retail sales by 2020, remaining at that annual level through 2030.”<sup>73</sup>

### 6.2 Near-Term Targets Compared to Currently Expected Achievement

The Working Group compiled publicly available electric efficiency savings commitments by program administrator for years 2016-2018 (i.e., from ETIPs and CEF filings), as well as ranges for estimated savings from codes and standards. For efficiency savings in the relatively near term, this data allowed us to roughly compare the estimated energy efficiency impacts from currently planned actions to (1) the Statewide Minimum Energy Efficiency Achievement Levels developed using the CES Benchmarking Option and (2) the Efficiency Ramp Up Strategy, as described above.

Figure X shows this comparison of targets to currently expected energy efficiency achievement, as a “stack up” graph that shows electric efficiency savings in GWh for the year 2019. Note that in Figure X, savings are shown “at the meter,” not accounting for line losses that are factored into wholesale savings targets relative to the NYISO econometric forecast. [MAY CONVERT TO WHOLESALE.]

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<sup>71</sup> See Optimal Energy Inc., *Energy Efficiency and Renewable Energy Potential Study of New York State* (2014), at 16 (showing 2030 economic electric energy efficiency potential to be 91,856 GWh; if New York were to achieve 1.4% savings in 2017 and ramp up to .4% more than that every year until 2030, it would achieve less than 90,000 GWh of efficiency savings).

<sup>72</sup> For example, the potential study could have included more measures for agricultural, industrial, mining, streetlighting, whole building, and low income energy efficiency. There could also have been an increased focus on efficiency savings from behavioral measures, retrocommissioning, and operational energy efficiency.

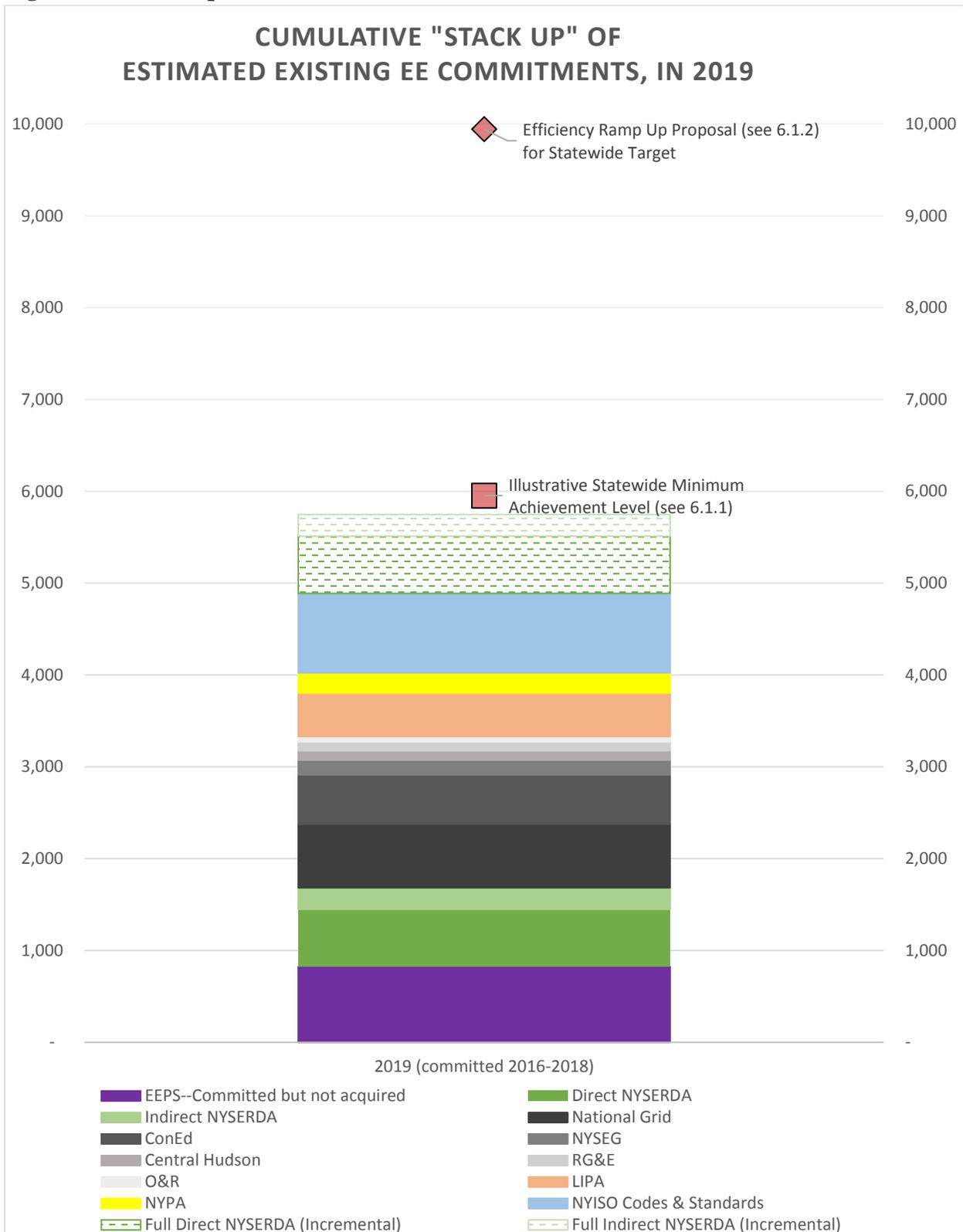
<sup>73</sup> *Aiming Higher*, at ii.

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Where Working Group members hold significantly different views on whether or not it is appropriate to anticipate savings from a potential component of total expected savings, the associated “wedge” is shown with lightly dotted shading in the graphic. To approximate energy efficiency achievement in terms of the total normalized GWh consumption that is expected to be observed in load reduction, we assume a uniform one-year “lag” from when program funds are scheduled to be “committed” to energy efficiency activities and the associated impact on load. Appendix C further describes the data sources and assumptions applied.

[NOTE: THE COMPONENTS OF THIS “STACK UP” ARE UNDER ACTIVE DISCUSSION BY THE WORKING GROUP, AND DATA IS BEING CROSS-CHECKED FOR ACCURACY. THE FINAL REPORT MAY INCLUDE A REVISED STACK UP OR MULTIPLE STACK UP CHARTS THAT SHOW, FOR EXAMPLE, VARYING ASSUMPTIONS REGARDING CODES ACHIEVEMENT.]

Figure X: “Stack Up” in 2019



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Among Working Group members, analysis of the results from this “stack up” comparison varied, in part based on what level of uncertainty members assumed for various components of potential load reduction.

To some Working Group members, the Minimum Statewide Energy Efficiency Achievement Level trajectory appears reasonable to meet or exceed over the next several years, given the backloading employed. That is, the annual statewide savings “at the meter” of about 6,000 GWh by 2019 (cumulative from 2016) shown on Figure X appears within reach. In this analysis, it is appropriate to factor in an assumption for savings from codes and standards, following NYISO’s methodology as introduced in the 2016 NYISO Goldbook.<sup>74</sup> Even allowing for some uncertainty regarding program achievement relative to commitments, this view holds that utilities could realistically increase the impact (in terms of MWh acquired per dollar) of their currently funded efficiency programs to fill a modest gap in the near term. Over the medium and longer-term, more market-initiated energy efficiency would be needed to keep pace with the expected trajectory of savings.

Other Working Group members believe that it is likely that the 2019 Minimum Statewide Achievement Level highlighted in the “stack up” graphic will not be met unless there is a sufficient increase in energy efficiency investments such as those made by utilities to enable increased adoption of energy efficiency.

The Joint Utilities note that Codes and Standards represents approximately 16% of the Statewide Minimum Achievement Level, a number based on a non-transparent<sup>75</sup> methodology utilized by the NYISO reliant on estimates and counterfactual assessments, as described to members of this Working Group.<sup>76</sup> The Joint Utilities believe that a more appropriate analytical approach would be to estimate energy reductions based on specific adoptions of codes and their corresponding compliance rates; based on experience in other states such as Massachusetts and Rhode Island, it appears codes produced energy savings at levels significantly below that suggested by the methodology used by the NYISO. The NYISO estimates appear to be subject to significant uncertainties, including geographical allocation of energy reductions from codes and standards across New York. The methodology also does not appear to consider other potential variables that cause changes in electricity consumption, which may shift in the future. Further, the Joint Utilities note that in the EEPS 2 period, NYSERDA’s achieved electric efficiency

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<sup>74</sup> Cite

<sup>75</sup> An analyst at the NYISO indicated that the methodology employed is not public. The geographic distribution of energy reductions from such codes and standards as well as details of assumptions is unclear to members of this Working Group.

<sup>76</sup> An analyst at the NYISO described using a triangulation method based on (i) a retrospective empirical analysis that compares historic normalized electric load counterfactual to actual reported contributions from energy efficiency programs with an attribution of the remaining, unexplained energy use reduction as one estimate of the impact of codes and standards: (ii) a comparison of the estimate with national and regional results reported in literature: and (iii) an estimate of NYSERDA’s programs’ codes and standards impact, as the basis for a discount factor to avoid double counting.

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savings has averaged about 55% of its targets<sup>77</sup>; note that in Figure X, 50% NYSERDA achievement is shown in the solid portion of the “stack up” graphic and the balance is shown as dotted to indicate uncertainty. NYSERDA’s new market animation and market transformation activities have yet to demonstrate their viability in producing energy reductions.

All members of the Working Group agreed that this “stack up” comparison indicates that the 100% statewide target level calculated pursuant to the Efficiency Ramp Up Strategy is not achievable in the near-term based on the State’s currently-approved funding and existing suite of mechanisms to spur energy efficiency investments. The size of the gap perceived by Work Group members varied in the same manner that views differed regarding the feasibility of attaining the statewide minimum achievement level shown.

### 6.2.1 Conclusions Drawn from the “Stack Up” Comparisons

The Joint Utilities’ and other Working Group members draw the following conclusions from the comparison of estimated energy efficiency impacts from currently planned actions to possible targets. First, because the contribution of some “stack up” resources could be overstated or otherwise subject to significant uncertainty, there could be a large gap between the target and energy savings actually delivered in the short run unless energy efficiency investments are ramped up. Second, in order to close the gap and not backslide on efficiency efforts, and to move on a trajectory toward achieving CES objectives, current efforts that have demonstrated success in enabling greater adoption of energy efficiency, such as utility programs, and related funding should be ramped up. Third, the Joint Utilities state that in the near term, energy efficiency related targets for the purposes of developing EAMs should be set based on assessments of energy efficiency results that may be expected from adequately funded utility programs, with service territory targets later developed after utilities perform potential studies. The Joint Utilities advise that utility targets for the purposes of an EAM should be established based on analytically determined realistic estimates of increased energy efficiency that reflect the ramp up of adequately funded utility investments in energy efficiency.

The Efficiency Ramp Up Advocates observe that according to the 2016 State Energy Efficiency Scorecard released by the American Council for an Energy-Efficient Economy, the NY IOU ETIP filings and NYSERDA CEF framework equate to an estimated 0.7% annual savings.<sup>78</sup> While the ACEEE data is calculated separately from the stack up in this Working Group’s report, this 0.7% total (for IOU and NYSERDA goals) is consistent with our analysis. The Efficiency Ramp Up Advocates feel strongly that the risk of backsliding as we build a bridge to the future energy vision is real, and that the best way to prevent this is through more ambitious goals than are represented by current plans and the creation or funding of adequate investment mechanisms to achieve those goals.

In the Efficiency Ramp Up Advocates’ view, while the Commission can to a certain extent accommodate uncertainty and disagreement regarding the level of energy efficiency achievement that is

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<sup>77</sup> Figure provided by NYSERDA staff.

<sup>78</sup> See ACEEE 2016 State Energy Efficiency Scorecard, at p. 141.

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achievable under current policies by approving EAMs that include a wide gap between the Minimum Achievement Level and Maximum Earnings Threshold, it is clear that greater funding for energy efficiency will be needed to allow for an increase in annual incremental efficiency of 0.4% per year, in line with the ramp ups that have been achieved in other leading states.

The Efficiency Ramp Up Advocates and the Joint Utilities thus find that additional mechanisms to spur energy efficiency investments, beyond those which have currently been approved, are needed to meet anticipated targets. These Working Group members therefore recommend that in conjunction with the establishment of energy efficiency EAMs, the Commission should advance new opportunities for directing funds to mechanisms to facilitate greater investments in energy efficiency (including traditional utility programs and, to the extent feasible, new REV market mechanisms).

### **6.3 Mechanisms to Support Energy Efficiency Achievement**

The Working Group recognizes that meeting New York State’s clean energy goals will require a meaningful and sustained increase in statewide energy efficiency, with public institutions and utilities working with and alongside private sector markets.

A core objective of the REV policy framework is to create vibrant markets for DER – including energy efficiency as an attractive business opportunity, in turn driving greater market-wide levels of energy efficiency. REV seeks to enable market actors to develop energy efficiency solutions and value propositions that meet the needs (and the economics) of customers and building decision makers. At present, however, energy efficiency transactions are limited by a range of market barriers that dampen demand and impede scale, which vary across technologies and (fragmented) market segments.

The path from today to a truly vibrant energy efficiency market is not straightforward. In discussing energy efficiency targets in the face of this uncertainty, our Working Group members put forth thoughtful ideas to achieve a successful outcome. As we worked to communicate candidly, the following were notable themes:

- Numerous Working Group members shared the view that an increase in ratepayer funding for energy efficiency initiatives would be needed to meet State policy goals, even as the form of such funding could be different than the system benefit charge mechanism adopted to date.
- Numerous members, including those from the Joint Utilities, expressed that a timely and efficient approach for narrowing the gap between current commitments and energy efficiency targets is to ramp up adequately funded utility programs to achieve savings that are above the levels reflected in the ETIPs. In this view, such programs have a track record of providing meaningful increases in energy efficiency, and are well-positioned to help the State make progress, and not backslide, even as other approaches are investigated and developed.
- Working Group Members acknowledged the opportunity of having both resource acquisition activity (expected to be primarily administered by utilities going forward) and market animation and transformation activity (as NYSERDA’s focus) as complementary tools. In the context of target

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setting, it also is important to recognize that market transformation activities require a multi-year time horizon to both develop and assess impact.

- The opportunities to apply the utilities’ core capabilities and assets in facilitating energy efficiency extend beyond mere delivery of conventional efficiency programs. These capabilities include information on customer usage patterns, which can enable tailored offerings and marketing; regular customer contact and a trusted brand that facilitate a utility’s role as a channel to market; relevant technical and engineering expertise; deep knowledge of their distribution system; and the potential to procure energy savings across a large portfolio of projects, thus mitigating technology performance risk through aggregation.
- Data access was recognized as an essential facilitator of clean energy market development. Ongoing and developing data issues are under consideration in multiple forums in New York State, to address the availability of customer and operational (system) data, the data needs among developers and service providers, and the utility's role in maintaining, assembling and disseminating essential data.
- Market barriers that NYSERDA will address through market transformation initiatives include lack of trust in technology performance by customers and financial institutions; limited and uneven awareness among consumers, vendors, and service providers; and financing gaps in current clean energy financing markets (the focus of NY Green Bank). NYSERDA is placing emphasis on the critical need to reduce “soft” costs and streamline implementation for energy efficiency projects, across government activities (e.g., permitting) and by encouraging market actors to coalesce around standardization.
- Working Group members further noted that to be motivated to invest in standardization, market players need to see the opportunity for steady revenue streams from a market at sufficient scale.
- This Working Group is currently investigating two critical focus areas that are necessary to develop strategies to create vibrant markets for energy efficiency as an attractive business opportunity, which are expected to drive greater market-wide levels of energy efficiency. The first is market design where we are identifying the key elements of a market to monetize and transact based on energy efficiency cashflows. Second, we are focusing on the value delivered via a unit of energy efficiency, who it’s delivered to, and what it’s worth. We also expect to uncover some potential new business models made possible via the selling of cashflows while recognizing the full value of a unit of energy. Our forthcoming report to the CEAC Steering Committee will provide recommendations related to the establishment of an energy efficiency market to procure savings, including the identification of thresholds or choice points we will need to be mindful of in order to get from here to there.

### 6.3.1 Recommendations on State Policy Direction

[THE TEXT BELOW WAS ADDED DURING THE REVIEW PERIOD. THE WORKING GROUP IS CONSIDERING WHERE TO PLACE SUCH POLICY POSITIONS IN THE FINAL REPORT, AND OTHER WORKING GROUP MEMBERS ALSO MAY DEVELOP OR SUPPORT POSITIONS.]

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### *6.3.1. Policy Changes Recommended by the Efficiency Ramp Up Advocates*

As the Commission transitions to the outcome-oriented approach to energy efficiency metrics and targets discussed in this report, many Working Group members (including Acadia Center, Alliance for Clean Energy New York, Association for Energy Affordability, Inc., CLEAResult, Lime Energy, Natural Resources Defense Council, Pace Energy & Climate Center, Sealed, and TRC Solutions, collectively, the “Efficiency Ramp Up Advocates”)<sup>79</sup> are concerned that a tension is emerging between the Commission’s clear desire to facilitate energy efficiency achievements that promote the cost effective achievement of the Clean Energy Standard and other state energy policy goals, and the State’s current funding framework and existing suite of mechanisms to spur energy efficiency investments.

While the Clean Energy Fund Order capped the amount of System Benefit Charge collections, no mechanism has yet been put in place that allows “the regulatory system . . . to properly value the” energy efficiency “attributes that the [System Benefit Charge] has been used to promote,” as envisioned in the Track 1 Order.<sup>80</sup> While the Value of DER proceeding is anticipated to yield a new methodology for crediting distributed generation projects that attempts to align such credits more closely with the value that distributed generation provides, in the view of the Efficiency Ramp Up Advocates the methodology being considered by Staff does not seem applicable to the unique attributes of the energy efficiency resource, and the scope of the proceeding has become focused on non-energy efficiency DERs.

This Working Group is currently developing a report, to be issued in 2017, that will explore potential new market mechanisms for spurring energy efficiency investments. But these new mechanisms are at the early stages of development. For many of these mechanisms, pilots will be prudent prior to wide scale adoption. In the interim, without some means of providing for greater efficiency achievement, the Efficiency Ramp Up Advocates are concerned that the State will continue to lose time and thus risk backsliding on existing levels of achievement, potentially jeopardizing a feasible, near-term ramp up in energy efficiency investment to facilitate the State’s energy policy goals.

Accordingly, to prevent this scenario from occurring and to instead ramp up efficiency savings levels, the Efficiency Ramp Up Advocates recommend that the Commission act, through individual utility rate cases or other means, to provide for greater investment for energy efficiency efforts in the near term. This channeling of new investment could take the form of not only the implementation of proven energy savings acquisition mechanisms, but also new mechanisms to spur energy efficiency investments by third party actors. The Working Group anticipates that many of the new procurement strategies to be recommended in its upcoming report will entail new utility-administered mechanisms that are more aligned with REV than traditional programs, but that nevertheless will necessitate new funding. The Efficiency Ramp Up Advocates suggest that by taking steps to establish a framework for such new investments now, the Commission can ensure that the State will be poised to implement promising new recommendations regarding energy efficiency procurement as rapidly as possible, thereby facilitating cost

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<sup>79</sup> NTD: Due to the tight time frame under which this draft was developed, not all working group members have yet had a chance to evaluate the proposals put forth herein.

<sup>80</sup> Add cite.

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effective achievement of the State’s energy policy goals such as those enshrined in the Clean Energy Standard.

## 7. Analysis of the Potential Impacts of Energy Efficiency Measures on System Efficiency

Consistent with the Track 2 Order, this Working Group has been tasked with analyzing the potential impacts of energy efficiency measures on peak load reduction and load factor. This section of the report offers a framework for such an assessment. We discuss the development of representative hourly load impact profiles for each energy efficiency measure. These profiles could then be used to calculate coincidence factors for each specific energy efficiency scenario the utility is trying to achieve, taking into account factors including, but not limited to, weather and geographic/network location.

We envision that New York State utilities can use the analytical approaches discussed in this section to help optimize and balance goals across the metrics related to energy efficiency, peak load reduction, and load factor in order to fulfill the requirement stated in the Track 2 Order that each utility should: “propose system efficiency targets that include both peak reduction and load factor. These targets will accompany energy efficiency targets...and should be implemented in a manner that achieves an optimal balance among the policy goals.”

The purview of this group has been to look only at the impacts of energy efficiency on peak load reduction and load factor and to create a framework to quantify those impacts. This work should eventually be expanded to include the impacts of other demand-side resources on peak load reduction and load factor. A similar framework should be developed to quantify the impacts of these resources as well. This will ultimately better reflect the goals and objectives of REV.

### 7.1 Framework for Assessing the Impacts of Energy Efficiency

Energy efficiency investments in the electricity sector in New York State have been driven by environmental policy goals primarily related to greenhouse gas emissions. Such investments have been generally undertaken through programs administered by utilities and the New York State Energy Research and Development Authority (NYSERDA) as well as the New York Power Authority (NYPA) and the Long Island Power Authority (LIPA), and have typically been enabled through funds collected from utility customers. To date, energy efficiency programs have sought to maximize the overall energy reduction (in kWh) achieved through energy efficiency measures. Under the REV initiative, New York State is developing a policy framework through proceedings such as those related to Reforming the Energy Vision (REV), Benefit Cost Analysis (BCA), Clean Energy Standard (CES), and Distributed System Implementation Plans (DSIP), which include Non-Wires Alternatives (NWA), to enable customers to better manage energy use, enhance penetration of DER, improve utility infrastructure efficiency, and reduce overall emissions. Such policies have provided new opportunities for energy efficiency resources to provide benefits such as enabling deferral of utility infrastructure or reductions in system or more localized load peaks. On the other hand, energy efficiency has adverse impacts on a load factor metric when consumption troughs are reduced more than load peaks. In order to better understand such varied impacts of energy efficiency it is important to understand how energy efficiency impacts electric consumption as an integrated whole and what benefits and challenges an increasing penetration of energy efficiency presents.

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At a fundamental level, implementation of energy efficiency at a particular location results in a reduction of overall energy use at that location. For example, if an air conditioner unit is replaced with a more efficient unit, it results in a reduction of overall energy use. In addition to the impact on overall energy use, the energy efficiency measure also results in a reduction of instantaneous energy demand during the times the EE measure is “operational”. Going back to the example of the air conditioner, a more efficient air conditioner will consume less energy on an instantaneous basis for all the hours in use as compared to a less efficient air conditioner that would have otherwise been in use. Thus, in combination, an energy efficiency measure would result in reduced overall consumption (kWh), reduced instantaneous energy demand (kW) during hours of the day when the measure is operational, and no impact on energy demand when the energy efficiency measure is not operational.

The complexity of determining such energy efficiency impacts arises from the differential operational patterns of an energy efficiency measure down to the granularity of each and every installation. As an example, the replacement of an incandescent light bulb with a more efficient lighting technology such as a LED bulb could have a wide array of impacts depending on the end use. Two identical LED bulbs (replacing identical incandescent bulbs) that are each typically on for 9 hours each day would result in the same reduction in overall energy use; but if one of the bulbs is located inside a school and is operational between 8 am and 5 pm, and the other bulb is located outside of the same school building and is operational between 8 pm and 5 am, they would have entirely different impacts on peak load and on the load curve. The bulb in the school may contribute to reducing the system peak in the large wholesale control area where it is located if the control area peaked within the hours the bulb is operational and thus contribute to a reduction in bulk system generation or transmission need. However, it may not provide any benefit to the distribution network or local feeder if it is located in a locally night-peaking residential area. Similarly, the outdoor light may not contribute to reducing the wholesale system peak but may provide a benefit by reducing the distribution peak. Further, these two indicative energy efficiency installations impact the load curve, and thus system efficiency, in different ways. The light bulb in the school will adversely impact the load factor of the night-peaking distribution system by reducing energy demand during daytime (here, off-peak) hours alone; and vice versa for the outdoor bulb installation that improves the load factor of the distribution system but is distinctly unhelpful as related to the load factor of the bulk system.

A clear and accurate understanding of the holistic impacts of energy efficiency are useful in encouraging specific energy efficiency measures to be located in specific areas when there are additional benefits in the form of peak reduction and capital infrastructure deferral. To accurately measure such “system impacts” of energy efficiency it is necessary to (i) develop representative hourly load impact profiles for an energy efficiency measure being installed for a specific end use in a specific customer segment (for example, a LED light bulb installation in the living room of an apartment in northeastern Brooklyn) on a peak day, and (ii) develop an ability to aggregate such representative curves of all energy efficiency measures in a given area in order to accurately predict the overall impact of all those measures collectively at various levels of the electrical system on a peak day. The figure below provides an illustration of the parameters that can be tracked for each energy efficiency measure through an hourly load curve. Such information can serve to illustrate the impact of the energy efficiency measure on system peak demand, network or local peak demand, energy use reduction during system peak hours, energy use

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reduction during network or local peak hours, the energy reduction during off-peak hours in addition to total energy reductions.

**Figure X - Energy Efficiency Measure Parameters**

EE Measure Area	Energy (kWh)	System Peak (kW)	Network Peak (kW)	System Peak (kWh)	Network Peak (kWh)	Off-Peak (kWh)
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Additionally, it would be beneficial to develop simulation-based 8,760 hourly load impact profiles for a one year period associated with each energy efficiency measure being installed for a specific end use for a specific customer segment. Such analyses are routinely performed for other DERs such as solar PV, but energy efficiency, with the attendant multiple end uses and customer segments, presents a high level of complexity with respect to data analysis and compilation. However, such analyses, when aggregated, provide significant benefits in estimating the impact of energy efficiency on not just all hours of a peak day but in estimating seasonal variations and impacts for a comprehensive understanding of system impacts.

Granular levels of information from an 8,760 hourly analysis of energy efficiency and associated aggregations providing impacts of energy efficiency on electricity demand both during a peak day and during different seasons is especially beneficial when an EE measure can have varied impacts at different levels of the system, as in the LED lighting example above. Such information can then inform decision making to appropriately balance multiple objectives in order to incent those installations where net positive impacts on the whole are maximized even if there is a negative impact on some levels of the electrical system.

Many utilities forecast the peak demand impact of a portfolio of energy efficiency measures on a utility service territory level, rather than on a more granular basis, since information on non-utility administered programs is more limited. Utilities may not know the location of customers reached by other entities, such as NYSERDA or NYPA, within their territory and therefore circuit or bank forecast impacts are unknown<sup>81</sup>. It is important that the collaboration between utilities, NYSERDA, and NYPA continue so the impact of programs within a utility service territory are understood on a more granular basis as is desirable when analyzing energy efficiency impacts on the distribution system. As NYSERDA's interventions shift increasingly to target market animation and transformation and the upstream supply chain (rather than specific homes and buildings), and as DER penetration grows, utilities will need to develop more sophisticated forecasting methodologies to account for significant new uncertainties, such as estimating real impacts on energy use from these activities.

Currently in New York, Con Edison has developed a framework for its energy efficiency programs, and has also used it for the Brooklyn Queens Demand Management (BQDM) program, to determine aggregate impacts on a peak day of energy efficiency measures in customer segments such as

<sup>81</sup> Case 14-M-0101, Initial Distributed System Implementation Plan, Orange and Rockland Utilities, Inc. (filed June 30, 2016).

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small businesses and multi-family apartments by consolidating hourly impacts of multiple measures used in multiple circumstances. Con Edison utilized an analytical tool which consists of pre-populated 8,760 hourly load profiles for various energy efficiency technologies among a variety of building types. The 8,760 hourly load profiles are based on the U.S. Department of Energy’s (DOE) benchmark building models, which were simulated using New York City Typical Meteorological Year (TMY) in 2009. The tool was also augmented to become capable of estimating impacts on peak load through a stand-alone peak calculator. Additional adjustments were made to the profiles so that the load curves would yield the demand savings prescribed by the New York State Technical Resource Manual. Con Edison has been performing hourly impact analyses for energy efficiency based on these load curves for both the system and network peaks. Simulations based on the 2013 DOE benchmark buildings with both the TMY file and actual 2013 weather readings provided the means for a sensitivity analysis of energy demand during unusually long heat-waves. Con Edison has developed a stand-alone load shape library that includes the hourly load profiles of the building and end-use types illustrated in the table below to estimate the load relief provided by various technologies.

**Figure X – Con Edison Load Shape Library by Building and End-Use Type**

<b>Code</b>	<b>Segment</b>
<b>SFR</b>	<b>Single Family - Res</b>
<b>MFS</b>	<b>Small Multi-Family - Res (2-4 units)</b>
<b>MFL</b>	<b>Large Multi-Family - Res (&gt;5 units)</b>
<b>OFL</b>	<b>Office-Large (&gt; 50,000 sq. ft.)</b>
<b>OFS</b>	<b>Office-Small (&lt;50,000 sq. ft.)</b>
<b>RES</b>	<b>Restaurant</b>
<b>RET</b>	<b>Retail</b>
<b>GRO</b>	<b>Grocery</b>
<b>WAR</b>	<b>Warehouse</b>
<b>EDU</b>	<b>Education</b>
<b>HOS</b>	<b>Hospital</b>
<b>NUR</b>	<b>Nursing Home</b>
<b>LOD</b>	<b>Lodging</b>
<b>ENT</b>	<b>Entertainment</b>
<b>MIS</b>	<b>Miscellaneous - Commercial</b>
<b>MFC</b>	<b>Multi-Family - Commercial (Common areas only)</b>
<b>IND</b>	<b>Industrial</b>
<b>Code</b>	<b>End-use</b>
<b>FAC</b>	<b>Total Facility (Electric)</b>
<b>LGT</b>	<b>Total Lighting (Electric)</b>
<b>LGI</b>	<b>Lighting Interior (Electric)</b>
<b>LGE</b>	<b>Lighting Exterior (Electric)</b>
<b>PLU</b>	<b>Plug Loads (Electric)</b>
<b>COO</b>	<b>Cooling (Electric)</b>

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<b>HEA</b>	<b>Heating (Electric)</b>
<b>VEN</b>	<b>Fans/Ventilation (Electric)</b>
<b>HVA</b>	<b>Total HVAC (Electric)</b>
<b>REF</b>	<b>Refrigeration (Electric)</b>
<b>DHW</b>	<b>Hot Water (Electric)</b>
<b>GFA</b>	<b>Total Facility (Gas)</b>
<b>GHE</b>	<b>Heating (Gas)</b>
<b>GDW</b>	<b>Hot Water (Gas)</b>
<b>GIE</b>	<b>Interior Equipment (Gas)</b>

In an additional demonstration of complexity arising out of distinct local variations, Con Edison conducted a rigorous Measurement and Verification (M&V) pilot in the BQDM area to secondarily validate hourly energy efficiency load reductions and provide assurance that the estimates of hourly impacts of energy efficiency developed using existing tools were indeed accurate. The pilot was conducted by measuring load reductions at a statistically representative sample of installation locations. Results indicated variations from the energy efficiency load curves developed for New York City as a whole, implying that even within a territory such as New York City significant variations in energy efficiency impacts can be found, from borough to borough or even within a borough. Experience from the BQDM program’s pilot implies that utilities and other entities providing incentives can appropriately balance objectives of accuracy that can be achieved through an increasingly granular analysis against the use of a simpler, less expensive approach employing broader geographic generalizations when such an approach would suffice.

As demonstrated in this section, energy measures produce different impacts both between measures (lighting versus insulation, etc.) as well as within measures (time of year, customer class, etc.). For example, the replacement of an inefficient bulb with an efficient bulb will only produce demand savings during the time that the bulb is operational but those hours of operation could vary among customer classes and by time of year while the actual measure is the same.

It is also important to note that energy efficiency programs in New York have traditionally been targeted at decreasing overall energy consumption (kWh), which is a critical component to reaching the clean energy goals and objectives of the state as discussed within this report. Therefore, energy efficiency measures that provide an overall energy consumption reduction, but that may negatively impact distribution system efficiency through a reduction in the related load factor, should not automatically be precluded from receiving incentives based solely on their impact on the distribution level load factor. The Commission has outlined goals that are targeted at both carbon reduction and peak reduction. In order to create metrics and incentives that are not competing with each other in a manner as to preclude a reasonable and optimal balancing among objectives, strategies should be designed to optimally realize the benefits of both energy efficiency and system efficiency goals while at the same time recognizing competing factors. In a similar vein, a utility can leverage funding and resources available through both system efficiency and energy efficiency programs to implement measures that provide both a distribution benefit and overall energy savings.

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The Working Group recommends that representative hourly load impact profiles be created for all energy efficiency measures that are included in utility system planning. As an interim step, when a utility puts out a Request for Proposals (RFP) for energy efficiency solutions to satisfy a non-wires alternative need, it could indicate what system need it is trying to fill (i.e., peak reduction, duration of need etc.) and require the third party energy efficiency provider to demonstrate, through an energy efficiency impact study, how their proposed measure fulfills that need. The utility might want to hire an independent third party consultant to verify that these energy efficiency impact studies seem reasonable and/or to conduct an M&V study after the measures have been installed to confirm that the energy efficiency measures had the desired impact. These energy efficiency impact studies will provide additional, more granular information about energy efficiency measures that will most likely precipitate the need for a better forecasting process to incorporate the greater level of energy efficiency detail (see Appendix E on forecasting).

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### **8. Summary of Findings to Date and Additional Analysis Needed**

This report documents our Working Group's research, analysis, and discussion in response to the Commission's direction to the CEAC to develop recommendations regarding metrics and targets to inform a utility performance incentive for energy efficiency, with specific attention to: (1) outcome-oriented metrics, including consideration of electric usage intensity metrics and normalization methodologies and (2) electric efficiency targets that go beyond those included in the existing utility ETIP and CEF programs. It further responds to the Commission's instruction to generically analyze the potential impacts of energy efficiency measures on peak load reduction and load factor metrics. These initial tasks are elements of the Working Group's overall work to develop strategies to create vibrant markets for energy efficiency as an attractive business opportunity, resulting in greater market wide levels of energy efficiency with less need for direct ratepayer support.

An overarching finding of this Working Group is that significantly more analytical work is needed in order to determine the most appropriate energy efficiency metrics and targets to support an outcome-oriented, performance-based incentive for utilities. In multiple instances, this report therefore presents options, preliminary recommendations from stakeholders (some as Working Group recommendations, others from defined group of stakeholders), or topics for consideration to inform additional analysis.

The Working Group defined and investigated two categories of outcome-oriented metrics for electric energy efficiency: (1) consumption metrics that measure the net change in normalized electricity use (e.g., wholesale or retail sales) across the utility service territory over time and (2) intensity metrics that measure the net change in normalized electricity use on a per unit level (e.g., usage per capita or per square feet of building floor area) across a sector over time. In both cases, the intent of the metric is to measure savings attributable to aggregate energy efficiency activities, spanning programmatic and policy interventions and market-initiated activity that operates without utility or government direct incentives. Based on our analysis to date, the Working Group identified that one practical means to implement an outcome-oriented approach may be utilize a consumption metric that measures the reduction in normalized MWh sales for the service territory as a whole, with corresponding targets for each utility. As discussed in the normalization section, the exact approach to calculating this metric would need to be further developed. In implementing such a consumption metric, sector-specific intensity metrics could also be tracked, with electricity usage per capita in the residential sector and electricity usage per employee in the commercial sector assessed to be the most promising metrics.

Specifying an outcome-oriented metric for energy efficiency will require normalization of electricity sales for weather and certain other factors that drive load, including economic growth and anticipated increases in "good load" (i.e., beneficial heat pumps and electric vehicles). The Working Group is unable to recommend a precise method for normalization and underscores the need for further analysis by specialists. With respect to weather normalization, we propose for consideration the potential development of a regression model using daily electricity consumption data and weather data over a short period of time; subsequently, the weather-normalized data could be aggregated for the year and used

either to directly construct an intensity metric or to develop an econometric model that further adjusts for economic variables.

We were unable to identify an econometric modeling approach that we felt comfortable recommending, in large part due to the challenges associated with developing a model capable of producing adequately precise estimates. In other words, confidence intervals were so wide under the methodologies that we examined that those methodologies may not be suitable for adequately measuring achievement of the specified energy efficiency outcomes. Subsequent analysis should include investigation of whether coefficient estimates derived from an econometric model could be used in setting an outcome-oriented energy efficiency target, a procedure which is expected to result in a tighter confidence interval. The Working Group recommends that any outcome-oriented metric under consideration should be tested against historic data to verify that the metric is appropriate for the purposes of measuring progress in the outcome being sought. Further, any econometric model(s) implemented should be benchmarked annually against historical data to verify continued model accuracy.

The Working Group recommends that mechanisms to account and adjust for fuel-switching be developed and phased in incrementally, with initial focus on “good load” from electric vehicles and heat pumps. We propose that outcome-oriented electric efficiency targets be set in a manner that assumes no load from beneficial heat pumps or electric vehicles. Assuming that actual (normalized) load is used for purposes of measuring achievement of the outcome-oriented targets, an ex-post adjustment then will need to be made to subtract estimated load from EVs and heat pumps for purposes of assessing achievement. The Working Group also identified the need for further study to assess whether or not an outcome-oriented metric is likely to meaningfully incentivize fuel switches away from electricity toward fuel sources that continue to create, and in fact may increase, carbon emissions or other forms of pollution (because under an outcome-oriented metric, without adjustment such fuel switches are credited equally to load eliminated through efficiency).

This Working Group’s investigation has centered on particular types of outcome-oriented metrics and targets for electric energy efficiency, consistent with our Working Group’s scope. The Working Group discussed the merit in considering outcome-oriented metrics and load reduction targets that do not attempt to disaggregate energy efficiency from other behind-the-meter load modifiers including distributed generation. We observe that with an increase in the number of types and the magnitude of DERs, it may become more difficult to appropriately determine the accuracy of the models used to assess an outcome-oriented metric – especially if targeted to one resource type, such as energy efficiency.

In time, the Commission also may wish to consider moving from a metric that assesses electric load only to a unified metric that measures total energy usage, total energy intensity, or total carbon intensity across electricity and fuels. Such a metric could be a means of tracking and incenting utilities to facilitate actions that decrease energy usage across all fuels or accelerate environmentally beneficial fuel switching. National energy intensity indicators reported in the United States and in Europe generally measure total energy usage. The Working Group emphasizes that this is a complex topic that requires much further thought and analysis; it is not feasible to offer recommendations at this time.

With respect to setting electric efficiency targets, the Working Group found it premature to propose utility-specific performance incentive (EAM) targets in this report since additional work is required to specify the outcome-based metric or metrics which would be used to measure progress toward the target level of performance. Our discussion of target setting focused on statewide energy efficiency achievement in terms of aggregate weather-normalized electric load reduction, in GWhs, relative to the NYISO statewide electric energy econometric forecast (which is unadjusted for new DER).

Working Group members diverged as to the appropriate approach for setting electric efficiency targets at the state level and for each of the state's utilities. This report describes options for target setting rather than a consensus recommendation.

One approach considered would develop minimum statewide energy efficiency achievement levels that cumulatively sum to the total efficiency assumed in the CES Order by 2030, while allowing for a non-linear trajectory over the 2016-2030 period with greater energy savings in the later years (i.e., modest backloading). The Working Group did not reach agreement on a level of energy efficiency that would represent a "100% target" for statewide or utility achievement above the minimum level under this approach.

A second approach recommended by multiple Working Group members would "ramp up" near-term targets such that annual incremental energy efficiency savings as a percentage of sales increases by 0.4% per year. Under this strategy, long-term targets to 2030 would be set based on a new energy efficiency potential study that would be divided by utility service territory. The Joint Utilities generally support the ramp up of adequately funded energy efficiency investments and the completion of potential studies, although they do not endorse the specific ramp up rate as described in this report. The Joint Utilities advise that near-term utility energy efficiency targets for the purposes of an EAMs should be established based on realistic estimates of savings that reflect the ramp up of adequately funded utility investments in energy efficiency.

In order to assess whether additional policies or funding mechanisms would be needed in order to achieve the targets set forth under each approach, the Working Group conducted a "stack up" comparison between (1) compiled estimates of existing energy efficiency commitments across program administrators and expected savings from codes and standards and (2) illustrative electric efficiency targets. Among Working Group members, analysis of this data varied, based on what level of uncertainty members assumed for various components of potential load reduction as well as what target members considered the most relevant to compare against. The majority of Working Group members concluded from this "stack up" comparison that in the near-term, the Commission should direct additional funds to energy efficiency, including established utility programs and, to the extent feasible, new REV market mechanisms. In this view, a reduction in ratepayer support for energy efficiency is not realistic in the near-term, and risks backsliding on existing levels of achievement and jeopardizing cost-effective achievement of the State Energy Plan and Clean Energy Standard goals. Some Working Group members emphasized the need for further analysis to consider the cost-effectiveness of alternative approaches to achieving targets, and to quantify the higher level(s) of ratepayer collections that would be required to support achievement of higher energy efficiency targets in the near-term as compared to the benefits realized from higher savings, including an anticipated reduction in CES compliance costs. [NOTE:

FINAL SENTENCE REFLECTS COMMENTS IN WORKING GROUP REVIEW PERIOD; NEEDS TO BE DEVELOPED IN THE REPORT.]

In addition to considering targets for the overall energy reduction achieved through energy efficiency, the Working group analyzed the potential impacts of energy efficiency measures on peak load reduction and load factor metrics. The report finds that to accurately measure how energy efficiency installations affect “system efficiency” metrics it is necessary to (i) develop representative hourly load impact profiles for an energy efficiency measure being installed for a specific end use in a specific customer segment (for example, a LED light bulb installation in the living room of an apartment in northeastern Brooklyn) on a peak day, and (ii) develop an ability to aggregate such representative curves of all energy efficiency measures in a given area in order to accurately predict the overall impact of all those measures collectively at various levels of the electrical system on a peak day. The Working Group recommends that representative hourly load impact profiles be created for all energy efficiency measures that are included in utility system planning.

Given time and capacity constraints, the Working Group decided to limit its initial investigation to metrics and targets for electric efficiency, although we stress and acknowledge the importance of increasing efficiency savings across all fuels. Recognizing the additional analysis still required for electric efficiency metrics, the Working Group is not equipped to immediately extend its work to consider metrics and targets for natural gas efficiency.

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[MULTIPLE APPENDICES WERE ADDED DURING THE REVIEW PERIOD AND ARE UNDER REVIEW BY THE WORKING GROUP]

### **APPENDIX A: Assessment of Data Availability for Potential Energy Intensity Metrics**

[ADDED DURING THE REVIEW PERIOD AND UNDER REVIEW BY THE WORKING GROUP]

#### **1. Residential Sector**

##### **1.1 kWh per Customer Meter**

- Weather-normalized residential sales divided by a count of residential meters in a utility's territory.

The EIA publishes annually the retail sales and estimates of customer meter counts by utility. Utilities self-report these values, so they should be internally consistent in how they report sales and counts to ensure reliable comparisons to a baseline year.

##### **1.2 kWh per Customer Premise**

- Weather-normalized residential sales divided by a count of residential buildings in a utility's territory.

No reliable estimates for residential building counts exist. The decennial Residential Finance Survey, which provides data on properties, was last conducted in 2001 and aggregates NY results with the Northeast Census Region.

##### **1.3 kWh per Capita**

- Weather-normalized residential sales divided by estimates of a utility territory's population.

Population estimates at the county level are published annually by the US Census Bureau, which can be aggregated to utility service territory in a straightforward manner.

##### **1.4 kWh per Household**

- Weather-normalized residential sales divided by an estimate of the number of households in the utility territory.

The American Community Survey (ACS) publishes annually the number of occupied housing units at the county level. 1-year ACS estimates are less reliable than 5-year estimates because they use small sample sizes.

##### **1.5 kWh per Square Feet of Occupied Housing Units**

- Weather-normalized residential sales divided by an estimate of the floor area of occupied housing in the utility territory.

There are no publicly available time series data on residential floor space. The American Housing Survey data published biennially counts occupied housing units by square footage ranges for 25 metropolitan areas.

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## **2. Commercial and Institutional Sector**

### **2.1 kWh per Customer Meter**

- Weather-normalized commercial sales divided by a count of commercial meters in a utility's territory.

Sales and counts of customer data are available through the EIA data. There may be categorization errors with apartment buildings and small industrial customers categorized as commercial, but this can be negated by internal consistency in reporting sales and counts.

### **2.2 kWh per Customer Premise**

- Weather-normalized commercial sales divided by a count of commercial buildings in a utility's territory.

The Commercial Buildings Energy Consumption Survey (CBECS) provides estimates of commercial building counts every five years, but results are only reported down to the Census Division Level.

### **2.3 kWh per Square Feet of Commercial Building Space**

- Weather-normalized commercial sales divided by an estimate of the floor area of commercial buildings in the utility territory.

There are no reliable publicly available time series estimates of commercial floor space. CBECS estimates are only conducted every five years and also lacks sufficient granularity because results are reported down to the Census Division level. Data from private companies is not updated with known frequency. Local tax assessors' offices may be able to provide data for certain jurisdictions, like the NYC PLUTO database which is updated twice annually.

### **2.4 kWh per Employee**

- Weather-normalized commercial sales divided by an estimate of the number of employees in the commercial/services sectors in the utility service territory.

NYS Department of Labor reports monthly employment data by industry, statewide, by metropolitan area, and by minor county. Industries are classified according to their North American Industry Classification System (NAICS) code.

### **2.5 kWh per Gross State Product (GSP)**

- Weather-normalized commercial sales divided by an estimate of the commercial-sector GSP in the utility service territory.

The Bureau of Economic Analysis produces GDP data by nation, states and metropolitan areas only, making it difficult to map GSP data to utility territory. BEA publishes state-level GDP data quarterly, and metropolitan-level data annually. No forecasts currently exist for GSP data.

## **3. Industrial Sector**

### **3.1 kWh per Customer Premise**

- Weather-normalized industrial sales divided by a count of industrial buildings in a utility's territory.

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No reliable data for industrial building counts exists.

### **3.2 kWh per GSP**

- Weather-normalized industrial sales divided by an estimate of industrial-sector GSP (manufacturing and non-manufacturing) in the utility service territory.

Industrial sales data can be obtained from the EIA data but no reliable data source currently isolates load and GSP for industrial sector.

### **3.3 kWh per Value Added**

- Weather-normalized industrial sales divided by an estimate of value added in the utility service territory.

No data exists that isolates GDP for industrial sector at a level of granularity for reliable mapping to utility service territory.

## **4. Commercial and Industrial (C&I) Sectors Aggregated**

### **4.1 kWh per Gross State Product (GSP)**

- Weather-normalized commercial and industrial sales divided by an estimate of the GSP in the utility service territory.

BEA publishes state-level GDP data quarterly, and metropolitan-level data annually. However, the BEA does not currently provide GDP data by county, making it difficult to map this data to utility service territory.

**APPENDIX B: Minimum Energy Efficiency Achievement Levels Compared to Achievable and Economic Potential Estimates**

[ADDED DURING THE REVIEW PERIOD AND UNDER REVIEW BY THE WORKING GROUP]

The Working Group requested that Optimal Energy provide an approximate estimate of the electric energy efficiency potential in New York State by utility service territory using the results from the *Energy Efficiency and Renewable Energy Potential Study of New York State* completed by Optimal Energy in 2014.<sup>82</sup> We made this request after learning that the majority of the State’s investor owned utilities do not have a current energy efficiency potential study for their New York State service territory.

The Table below shows minimum electric energy efficiency achievement levels by 2030 considered by the Working Group (i.e., cumulative savings over the 2016-2030 period) as compared to estimates of efficiency potential. As noted in Section 6.1.1 of this report, the allocation of energy efficiency achievement by utility service territory is based on an estimate of a given utility’s share of 2014 electricity sales, and is considered an indicative (first approximation) allocation.

GWh values represent wholesale savings			<i>Optimal Electric Energy Efficiency Potential Study Results by Year 2030</i>	
		Cumulative GWh savings over years 2016 - 2030	<i>Achievable Potential</i>	<i>Economic Potential</i>
<b>NYS Minimum EE Achievement Trajectory</b> (report Sect. 6.1.1)		36,828	34,351	86,860
<b>Indicative Allocation of Minimum EE Achievement by Utility</b>	<i>% of statewide savings by utility</i>	Cumulative GWh savings over years 2016 - 2030	<i>Achievable Potential</i>	<i>Economic Potential</i>
Central Hudson Gas & Elec Corp	3.5%	1,304	1,228	3,109
Consolidated Edison Co-NY Inc	39.7%	14,627	15,428	39,260
Niagara Mohawk Power Corp.	24.2%	8,921	7,522	18,980
New York State Elec & Gas Corp	10.8%	3,974	3,377	8,523
Orange & Rockland Utils Inc	2.8%	1,035	974	2,466
Rochester Gas & Electric Corp	5.0%	1,852	1,562	3,941
Long Island Power Authority	13.9%	5,115	5,489	13,690

**Summary of Methodology used by Optimal Energy to Apportion Potential**

To estimate the electric energy efficiency potential by utility service territory, Optimal used a simplified apportioning of the potential estimated for the original analysis regions to each of the electric

<sup>82</sup> Optimal Energy. 2014. *Energy Efficiency and Renewable Energy Potential Study of New York State, Volume 2: Energy Efficiency Methodology and Detailed Results*. <https://www.nyscrda.ny.gov/-/media/Files/EDPPP/Energy-Prices/Energy-Statistics/14-19-EE-RE-Potential-Study-Vol2.pdf>

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utilities within those regions. This apportioning was based on an estimate of a given utility’s share of total regional 2014 electricity sales. Using the most recent utility sales data available from the U.S. Energy Information Administration (EIA),<sup>83</sup> the apportioning process was conducted for each of the four original analysis regions (i.e., New York City, Long Island, Hudson Valley, and Upstate).

Each utility’s share of total regional sales was distributed to the residential, commercial, and industrial sectors based on the relative distributions from the 2014 EIA sales data. Once regional sales were distributed by utility by sector, these same shares were applied to the results from the original potential analysis to estimate the electric energy efficiency potential by utility territory. To determine end-use and building type distributions, the appropriate end-use and building type distributions for each analysis region from the 2014 potential study were applied to the portion of a utility’s potential within a given region. Finally, for utilities with territory across multiple analysis regions, the estimated potential in all regions were summed to develop the total potential for those utilities.

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<sup>83</sup> U.S. Energy Information Administration (EIA). 2015. *Electric power sales, revenue, and energy efficiency Form EIA-861 detailed data file*. <https://www.eia.gov/electricity/data/eia861/>. See file “Sales\_Ult\_Cust\_2014.xls”.

## APPENDIX C: Data Sources and Methodology for the “Stack Up” Graphic

### **Near-Term energy efficiency Estimates versus energy efficiency Targets "Stack Up" Approach**

To estimate 2019 energy efficiency impacts from planned actions, publicly available estimates of savings by program administrator were compiled for program years 2016-2018. A one-year "lag" from commitment to impact on load was assumed.

NYSERDA estimates were derived from Clean Energy Fund Investment Plan Budget Accounting and Benefits Chapter filed on August 8, 2016. All direct 2016-2019 energy efficiency market development portfolio benefits from Table 5 were included except for savings attributed to CHP. These benefits are estimates of savings directly attributable to program activities. The direct benefits value was discounted by 50% to account for potential uncertainty in achieving stated goals. The remaining 50% of the direct savings is included as a line item in the “stack up,” but coded “uncertain.” Indirect market development portfolio benefits were also included, which are estimates of savings from market effects expected to accrue over the longer term as a result of NYSERDA’s investment and follow on market activity. Annual indirect benefits were calculated by reducing the 2025 cumulative annual indirect market development portfolio benefits from Table 4 proportionally to adjust for non-energy efficiency market development benefits, then dividing the resulting value by ten. (Indirect savings from CHP were not included in this total, so no adjustments were necessary.) This annual value was discounted by 50% to account for some uncertainty in timing of benefits realization in the short term. The remaining 50% of annual indirect savings is included as a line item in the “stack up,” but coded “uncertain.” (Note that estimated indirect benefits published in Table 4 are already discounted by 50%.) NYSERDA savings commitments were attributed to utility service territory using the same proportions NYISO uses to attribute cumulative historical NYSERDA program energy efficiency savings from 2001-2015 drawn from DPS data to service territory as part of its forecasting activities. NYSERDA expects to update its CEF estimated benefits on a regular basis as investment plans are updated, thus NYSERDA’s estimate of load-impacting energy efficiency commitments can be viewed as conservative, even including the portions labelled “uncertain.”

Annual utility savings estimates for 2016-2018 derived from ETIPS filings were included, as were LIPA energy efficiency savings estimates for 2016-2018 derived from the PSEG Long Island Utility 2.0 plan (LIPA savings attributed to PV and CHP programs were removed). Estimated NYPA annual energy efficiency savings were derived by scaling statewide savings from 2014 through August 2016 provided by NYPA. The NYPA data set broken down by NYISO load zone is included in the workbook for reference.

Committed, but not acquired, energy efficiency EEPs 2 savings were estimated using energy efficiency EEPs 2 Program Administrator performance data for Q1 of 2016 provided by NYS DPS. All PA contributions were discounted by 50% to provide a conservative estimate of not-yet-realized impacts of EEPs programs on load.

Estimated energy efficiency savings from building codes and standards and appliance standards (“C&S”) were derived from NYISO’s C&S forecasting methodology. This approach reflects a conservative estimate of savings impact from Codes & Standards, which is included in the 2016 NYISO Gold Book forecast. To estimate energy efficiency savings from C&S, NYISO uses a "triangulation" approach involving retrospective empirical analysis, a comparison against national and regional results reported in the literature, and an estimate of NYSERDA C&S program impact. In the retrospective

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analysis, historic annual energy efficiency achievements from all New York State programs from 2001-2014 were compiled and used to reconstitute and electric load history without reductions from energy efficiency. This reconstituted electric load history was then compared to an econometric, normalized historic electric load counterfactual for 2001-2014. This analytical delta was assessed against national and regional results and adjusted to derive a range of percentage values of overall load that could be attributed to C&S. Values were projected through 2026. These percentage values were discounted by 30% to avoid double counting any C&S savings attributed NYSERDA C&S program performance.

## APPENDIX D: Assessment of Codes and Standards

[ADDED DURING THE REVIEW PERIOD AND UNDER REVIEW BY THE WORKING GROUP]

The term “Codes and Standards (CSs)” refers to the broad set of rules (codes) and technical requirements (standards) governing buildings. CSs, among other things, directly influence energy consumption over the life of buildings. CSs not only govern and influence choices made during a building’s construction and design, they also impact a building’s operation and maintenance after construction. Additionally, when buildings are renovated, there are often CSs that impose new requirements on the building that did not exist when the building was constructed.

The United States has a unique process in the way CSs are developed. The two primary characteristics of the process are: (i) it is a deliberative and democratic process that applies improvements incrementally, and (ii) it takes into account cost efficiency and investment value<sup>84</sup>. However, unlike other jurisdictions with similar carbon reduction goals, CSs in the United States are not explicitly tied to emissions targets, lowering the direct usefulness of CSs<sup>85</sup>. Typically, a new set of CSs is developed through a stakeholder process and then evaluated by the U.S. Department of Energy before a set of recommended final model codes is released for consideration by the States. Individual states must adopt an energy code for commercial buildings (including any building taller than three stories, even those used as a residence) at least as stringent as the model code, and may choose to voluntarily adopt the model code for residential buildings, albeit with modifications based on local considerations<sup>86</sup>. Local jurisdictions are typically subject to State level CSs, but in some instances may choose to adopt more stringent CSs in order to accelerate adoption of rules and requirements aligned with beneficial policy goals such as sustainability, emissions, and resiliency. A review of the CSs is conducted on a triennial basis so innovations are applied “gradually across the building sector, reducing the risk for individual builders and contractors”<sup>87</sup>. But CSs are only effective if “they are enacted into law and enforced by state and local governments”<sup>88</sup>. Enforcement of CSs, especially as new CSs are adopted, requires state and local resources dedicated to the adequate training of highly skilled professionals such as building inspectors<sup>89</sup> who are able to be current with their knowledge and are able to report non-compliance so it may be remedied. During the current code cycle, NYSERDA provided funds for the training of both industry professionals and code officials<sup>90</sup>.

Model codes in the United States are developed through the International Code Council (ICC) that include topical, geographically specific codes such as the International Building Code (IBC) and International Residential Code (IRC). ICC also publishes the International Energy Conservation Code (IECC) and the International Green Construction Code (IgCC) that are developed with partnerships with organizations such as American Institute of Architects (AIA) and American Society of Heating,

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<sup>84</sup> “The Value and Impact of Building Codes”, pp. 1, Ellen Vaughan [Policy Director, Environmental and Energy Study Institute] and Jim Turner [Former Chief Counsel, Committee on Science and Technology, U.S. House of Representatives]

<sup>85</sup> “Worldwide Lessons: What NYC Can Learn From Five Peer Cities”, Urban Green Council, <http://urbangreencouncil.org/worldwidelessons>

<sup>86</sup> “Building Energy Codes Program – Adoption”, US Department of Energy, <https://www.energycodes.gov/adoption>

<sup>87</sup> See id.

<sup>88</sup> See id.

<sup>89</sup> See id, pp. 8

<sup>90</sup> “Energy Code Training Website”, NYSERDA, <http://www.nyserdacodetraining.com/>

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Refrigerating and Air-Conditioning Engineers (ASHRAE)<sup>91</sup>. In most jurisdictions, the ANSI/ASHRAE/IES energy standard 90.1 is allowed as an alternate compliance path (perhaps with modifications) to the local energy code.

### *Energy Usage Reduction from CSs*

At a national level, electricity consumption has been on a secular decline, especially so in recent years<sup>92</sup>. As highlighted in the ACEEE white paper, various authors have speculated about a number of reasons for the decline including economic recession and weakness, decline in manufacturing, energy efficiency programs, utility demand-side management, building codes and efficiency standards, fuel switching, and distributed generation<sup>93</sup>. While a regression analysis in that paper of key variables suggests that energy efficiency as well as CSs may explain a portion of the decline in electricity usage, the results must be viewed cautiously because of concerns related to high correlations between independent variables, impacts from variables that were not included, rebound effect (energy efficiency related savings resulting in overall increased energy consumption for reasons such as – increased other energy use due to similar levels of tolerance for energy related expenses from before installation of the energy efficiency measure), and less than a full realization of energy efficiency savings. Overall the analysis demonstrates the complexity of attributing drivers of electric use patterns to independent variables and exogenous factors.

While energy conservation codes result in energy use reductions and savings to customers, there is some ambiguity in its estimation. Expedient adoption of national CSs, or at levels more stringent than the national standard, in New York State would result in energy savings and economic benefits. Such savings are enhanced through better training and enforcement. It is also recommended that compliance rates be measured in all jurisdictions in New York to both help improve compliance and to conduct analysis of energy savings attributable to CSs. The US Department of Energy (DOE) estimates historical national savings from energy codes (all fuels) at \$44 billion and 4.2 quadrillion BTU between 1992 and 2012<sup>94</sup>. Projected savings are even larger, with newer codes saving energy consumers \$230 billion by 2040 and reducing carbon emissions by 3,478 million tons.

For New York State specifically, DOE estimates code adoption and enforcement will save \$250 million annually by 2030<sup>95</sup>. An analysis was done by the New York Independent System Operator (NYISO) in the most recent 2016 Gold Book. While details of the analysis are not public, NYISO has indicated that it employed a triangulation approach that utilized: (i) a retrospective empirical analysis that compared a historic normalized electric load counterfactual to actual reported contributions from energy efficiency programs with an attribution of the remaining, unexplained energy use reduction as one estimate of the impact of CSs; (ii) a comparison of the estimate with national and regional results reported in literature; and (iii) an estimate of NYSERDA's programs' CSs impact. The study showed savings of xxx. Such an approach is highly complex, non-transparent, and subject to uncertainties present for any econometric regression analysis. This includes non-consideration of other driving independent variables whose

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<sup>91</sup> See id., pp. 3

<sup>92</sup> "Why is electricity use no longer growing?", pp. 1, Steve Nadel and Rachel Young, ACEEE, February 2014

<sup>94</sup> "Program Impact Analysis", Building Energy Codes Program, US Department of Energy, <https://www.energycodes.gov/about/results>

<sup>94</sup> "Program Impact Analysis", Building Energy Codes Program, US Department of Energy, <https://www.energycodes.gov/about/results>

<sup>95</sup> "State Certification of Residential and Commercial Building Energy Codes", letter from US Secretary of Energy to Governor Andrew Cuomo, May 31, 2013, <https://www.energycodes.gov/sites/default/files/documents/NewYorkDOEDeterminationLetter05312013.pdf>

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patterns may shift in the future. Further the use of correction factors based on regional or national trends and the use of estimates increases the uncertainty of the conclusion. The attribution of energy use reduction to CSs is complicated by varying levels of compliance and enforcement across the state. An August 2014 article that highlighted the results of an audit of the architectural plans of New York City buildings by the Department of Buildings that showed 9 out of ten buildings in New York City failed to meet the energy code, some of which have been in place for 30 years<sup>96</sup>, noting however that some of the violations could have been minor. In New York City, for instance, plan review for energy code compliance has increased in the past several years, ensuring closer adherence to code energy targets in building design. The Institute for Market Transformation has analyzed how local jurisdictions may cost-effectively improve enforcement<sup>97</sup>. Since manufacturers generally produce equipment that just meets or exceeds contemporary CSs, adoption of more stringent CSs can lower costs for adopting more efficient technology as manufacturers make improved products available to the market<sup>98</sup>. On the other hand, policymakers must guard against the potential of new CSs having a deterrent effect of preventing upgrading of inefficient “grandfathered” equipment, if the economic cost of “meeting code” exceeds the desired level of financial benefits accrued through lower energy expenses after the upgrade.

Results from reports in Massachusetts and Rhode Island, both states in Northeast sharing some similarities with New York, indicate a level of impact of CSs that is significantly lower than the estimate suggested by the triangulation analysis employed by the NYISO. For example, the estimated 2016 savings in Massachusetts from CSs is 1,860 MWh statewide, an amount that can be extrapolated for New York as about 5,580 MWh of savings (about 2% of the NYISO estimate). A 2015 National Bureau of Economic Research (NBER) study to study the impact of CSs in the residential sector in California found that there was no discernible reduction in energy use when comparing residences built before 1978 when the first CSs were introduced and homes built after 1978 even after controlling for variables such as increase in home sizes, greater amounts of building in warmer areas and increase in the number of residents per home after 1978<sup>99</sup>.

Data collected through New York City’s Benchmarking and Disclosure Law (Local Law 84 of 2009) suggests that energy codes are having an effect. Some studies show that energy use in buildings generally increased each decade, until the advent of modern codes, at which point energy use begins to decline<sup>100</sup>. Further analytical study, specifically applicable to New York, able to correlate specific quantities of reductions in energy use to specific adoptions of code when combined with efforts to ensure compliance through enforcement, would be helpful. Such an analysis could also help in isolating and identifying other independent variable drivers that have been leading to lower energy use in recent years, and whose trajectory may change in the future.

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<sup>96</sup> “9 out of 10 building plans fail basic test”, Crain’s New York Business, Joe Anuta, August 18, 2014

<sup>97</sup> “Third-Party Performance Testing: A Case Study of Residential Energy Code Enforcement”, Institute for Market Transformation (IMT), <http://www.imt.org/resources/detail/case-study-1-third-party-performance-testing>

<sup>98</sup> Urban Green Council study of available boilers using data from the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) (<https://www.ahridirectory.org/ahridirectory/pages/home.aspx>) showed the vast majority met efficiency levels mandated by current code, with a small number of more efficient units available, and no boilers less efficient on the market.

<sup>99</sup> “How much energy do building codes save? Evidence from California”, Arik Levinson, Georgetown Economics Department and NBER, November 2015.

<sup>100</sup> “The New York City Energy & Water Use Report”, Urban Green Council, New York University, and The City of New York, <http://urbangreencouncil.org/content/reports/new-york-city-energy-water-use-report>, p34.

### APPENDIX E: Incorporating Energy Efficiency into Forecasting

Considering that our group was tasked with creating a framework to quantify the impacts of energy efficiency measures on peak load reduction and load factor in a granular manner, it might be beneficial in the future to modify the way in which load is forecasted in order to consider energy efficiency in a more precise and granular manner as well. When our group sent a data request to the utilities we asked them to describe how energy efficiency is accounted for in their forecasting and planning processes. All of the utilities responded that this is done as a post-model adjustment, although in two slightly different ways. For some utilities historic energy efficiency savings are embedded in the load data used to build the models and are thus carried through the forecast. Then the incremental difference between historic energy efficiency savings and additional savings from future planned programs are subtracted from the forecasting model results<sup>101</sup>. For other utilities, historic energy efficiency savings are first added back to historic load data to avoid double counting these savings. Once the model is developed, the forecast is then adjusted to account for past and future energy efficiency savings. This prevents the model from assuming that the historical energy efficiency growth pattern will continue into the future, allowing the pattern to be adjusted<sup>102</sup>.

The NYISO energy efficiency peak load reduction forecasting process starts with the EEPS scorecards and monthly reports. It then uses those to compute load factors. The load factors are then used to produce forecasts of peak load reduction by market sector.

California might be a place to look for ideas to begin to modify the forecasting process. Chris Ann Dickerson, the facilitator of the Demand Analysis Working Group (DAWG), describes in her paper how California incorporates energy efficiency impacts into its demand forecasts<sup>103</sup>. The California Energy Commission (CEC) is responsible for producing a statewide “reference” demand forecast as a part of its Integrated Energy Policy Report (IEPR). An issue then became how to adjust the IEPR forecast to reflect the impacts of new demand-side policies, including energy efficiency. Ideally, this would be done by identifying any impacts included in both the IEPR forecast and the utility estimates of demand-side resources expected to occur in their service territories during the forecast period, and subtracting out any impacts or estimates that were double-counted. However, since the IEPR forecast and the utility estimates were prepared using different starting points and assumptions, it was basically impossible to determine where any overlap occurred. The DAWG was born out of these issues and the need to improve methods and processes for incorporating energy efficiency impacts into demand forecasts.

A key objective of the DAWG has been to estimate demand-side impacts that are incremental to the IEPR forecast. The “Additional Achievable Energy Efficiency (AAEE)” analysis provides annual estimates of energy efficiency savings (from programs, codes, and standards), likely to occur, but not

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<sup>101</sup> This method is a variation on the “DSM Trend” Method identified in the “Incorporating DSM into the Load Forecast” (2010) paper by Itron. In the “DSM Trend” Method, the forecast is adjusted for net changes from the DSM trend line.

<sup>102</sup> This method is the same as the “Add Back” Method identified in the “Incorporating DSM into the Load Forecast” (2010) paper by Itron.

<sup>103</sup> Dickerson, Chris Ann. DAWG Days of the Summer Study: Demand Analysis Working Group. 2014.

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already “committed.” The AAEE estimates are developed primarily using data from the California Public Utility Commission’s (CPUC) energy efficiency potential and goals studies. This study analyzes the statewide market potential from utility programs for electricity usage (GWh) and peak demand (MW). With each successive analysis, the IEPR and the energy efficiency potential forecasts have become more in line with each other, leading to an AAEE analysis that is better coordinated with both. The IEPR forecast and energy efficiency potential and goals studies now match well on inputs such as economic/demographic data, building stock and vintage, historic program accomplishments, projections for the current energy efficiency program cycle and adopted codes and standards, unit energy consumption/end-use intensity, rate forecasts, forecasts for emerging technologies, and adjustments for codes and standards taking effect over the forecast period. Ultimately, this improves the process for developing forecasts and the quality of those forecasts.

## **APPENDIX F: Acronyms and Abbreviations**

BQDM – Brooklyn Queens Demand Management program

Btu – British Thermal Units

CCA – Community Choice Aggregation

CDD – Cooling Degree Days

CEAC – Clean Energy Advisory Counsel

CEF – Clean Energy Fund

CES – Clean Energy Standard

CHP – Combined Heat and Power

Commission – New York State Public Service Commission

CPUC – California Public Utility Commission

C&S – Codes and Standards

DAWG – Demand Analysis Working Group

DER – Distributed Energy Resource

DOE – U.S. Department of Energy

DPS – Department of Public Service

EAM – Earnings Adjustment Mechanism

EEPS – Energy Efficiency Portfolio Standard

EIA – U.S. Energy Information Administration

EPA – Environmental Protection Agency

ETIPS – Energy Efficiency Transmission Implementation Plans

EVs – Electric Vehicles

GWh – Gigawatt Hour

HDD – Heating Degree Days

IEPR – Integrated Energy Progress Report

kWh – Kilowatt-hour

kWh per GDP – Kilowatt-hour per Gross Domestic Product

LIPA – Long Island Power Authority

LMDI – Log Mean Divisia index

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MW – Megawatt

MWh - Megawatt-hour

NRDC – Natural Resources Defense Council

NYISO – New York Independent Systems Operator

NYPA – New York Power Authority

NYSERDA – New York State Energy Research and Development Authority

PV – Photovoltaic

REV – Reforming the Energy Vision

RFP – Request for Proposal

TMY – Typical Meteorological Year

VVO – Volt-Var Optimization technologies

Working Group – Energy Efficiency Procurement and Markets Working Group

# DRAFT FOR REVIEW

## Energy Efficiency Metrics and Targets Options Report

October 20<sup>th</sup> CEAC Steering Committee Meeting

*The overall purpose of the Energy Efficiency Procurement and Markets Working Group (the “Working Group”) is to develop strategies to create vibrant markets for energy efficiency as an attractive business opportunity, resulting in greater market-wide levels of energy efficiency with less need for direct ratepayer support.*

# 1. Report Responds to Initial Objectives

Commission's direction to the CEAC to develop recommendations regarding metrics and targets to inform a utility performance incentive for energy efficiency, with attention to:

- Outcome-oriented metrics, including consideration of electric usage intensity across the utility's territory and a normalization method.
- Electric efficiency targets that go beyond those included in the existing utility ETIP and CEF programs.

Also tasked to generically analyze the potential impacts of energy efficiency measures on peak load reduction and load factor metrics.

## 2. Policy Goals and Direction under REV

- CEAC “will recommend a target or set of targets” for electric efficiency designed to “reduc[e] the cost of achieving” the State Energy Plan and CES goals.
- Earnings Adjustment Mechanisms (EAMs) – performance-based incentives for utility shareholders – will be established for energy efficiency.
- Commission’s policy preference to use market transformation strategies where possible so as to leverage customer investment and outside capital to accomplish greater energy savings.
- Achievement under an “outcome-oriented metric” should be measured by system-wide energy savings that can be brought about by a combination of utility programs, third party initiated efforts, improvements in codes and standards, and market transformation.

# 3. Outcome-Oriented Metrics for Energy Efficiency

There are four central components of developing any EAM, including one for energy efficiency:

1. *Policy goals* that specify performance areas of interest and desired outcomes;
2. *Metrics* that provide a standard of measurement for assessing how well a utility is performing in the specified areas of interest;
3. *Targets* that define the level of performance that a utility is expected to achieve during a particular time period, as measured by the metrics; and
4. *Financial incentives* that are based on the utility's performance relative to the target.

### 3. Outcome-Oriented Metrics for Energy Efficiency

In the context of this report, the Working Group defines an “outcome-oriented” metric for electric energy efficiency to be **a metric that measures net changes in normalized electricity consumption across the utility service territory over time, or net changes in normalized electric usage intensity across a sector over time, that is attributable to aggregate energy efficiency activities across that territory or sector, spanning programmatic and policy interventions and market-initiated activity that operates without direct utility or government incentives.**

## 3.1.1 Potential to Align Utility Incentives with Policy Goals under REV

- Outcome-based incentives will allow utilities to determine the most effective strategy to achieve policy objectives,” including cooperation with DER providers and development of new business concepts that may not otherwise be considered under narrow, program-based incentives.
- Encourage utilities to collaborate with NYSERDA, NYPA, local governments, and Community Choice Aggregation (CCA) localities.
- Capture and give credit for longer-term market transformation savings and improvements in building energy codes.
- Administrative burden may be reduced by relying on an outcome-oriented EAM metric rather than requiring detailed measure-by-measure analysis, though program administrators will continue to track and report a variety of metrics to support effective program delivery, planning, and oversight.

## 3.1.2 Methodological Complexities & Implementation Risks Require a Thoughtful Approach

- Methodological and empirical issues related to the measurement of energy efficiency achievement are complex.
- With shareholder incentives at stake, the analytic approach and assumptions used are likely to be contested by parties.
- Risk of acrimony and finger-pointing if utilities determine that NYSERDA or NYPA are not delivering upon energy efficiency commitments, or are not allocating their resources equitably across utility service territories.
- If a utility perceives that it has limited control over whether or not an outcome-oriented EAM target is met or exceeded, it may have limited motivation to focus attention on energy efficiency.
- Stakeholders hold markedly different views around what level of territory-wide energy efficiency savings constitutes a “realistically achievable” EAM target for an outcome-oriented metric.

## 3.2 Options for Outcome-Oriented Metrics

1. Consumption metrics measure the change in overall energy use over time, for example, wholesale or retail electricity sales.
2. Intensity metrics measure the energy use on a per unit level, for example, usage per capita or per square feet of building floor area. Energy-intensity metrics and targets would need to be developed separately for the residential sector, the commercial sector, and the industrial sector to provide for forward-looking targets and meaningful interpretation.

In both cases, the measurement of energy usage would be normalized (or adjusted) for weather and certain other factors that drive load.

While at first glance energy intensity metrics and energy consumption metrics appear to be conceptually distinct from one another, through normalization the line between these two types of techniques blurs.

## 3.2.3 A Proposed Implementation Strategy

- A practical means to implement this outcome-oriented approach may be to utilize a consumption metric that measures reduction in normalized MWh consumption for the service territory as a whole, with corresponding targets for each utility.
- Sector-specific intensity metrics could be tracked: electricity usage per capita in the residential sector and electricity usage per employee in the commercial sector appear most promising. For the industrial sector, more study is required on the availability of sufficiently granular data to construct an electric usage intensity metric.
- Working Group notes that a possible approach would be the use of a “hybrid” policy that combines an outcome-based approach and a program-based approach, with some incentives provided pursuant to each approach. This would recognize the solid framework of utility incentives and funding tied directly to energy efficiency program-based achievements and combine it with the potential for greater savings using an outcome-oriented approach still under development.

## 3.2.3 A Proposed Implementation Strategy

- A practical means to implement this outcome-oriented approach may be to start by further defining a consumption metric that measures reduction in normalized MWh consumption for the service territory as a whole, with corresponding targets for each utility.
- Sector-specific intensity metrics could be tracked: electricity usage per capita in the residential sector and electricity usage per employee in the commercial sector appear most promising. For the industrial sector, more study is required on the availability of sufficiently granular data to construct an electric usage intensity metric.
- Working Group notes that a possible approach would be the use of a complementary “hybrid” policy that combines an outcome-based approach and a program-based approach. This would recognize the solid framework of utility incentives and funding tied directly to energy efficiency program-based achievements and combine it with the potential for greater savings using an outcome-oriented approach still under development.

# 4. Normalization Approaches to Measure Savings Attributable to Energy Efficiency

- Normalization is required for outcome-oriented metrics to control for factors beyond utility control (exogenous factors such as weather, economic activity, changes in the number of customers, etc.)
- Approaches are available to evaluate and isolate exogenous effects; each has strengths and weaknesses:
  1. Econometric modelling with independent exogenous variables
  2. Intensity metrics that account for the effect of a single exogenous variable that is included as the denominator
- Potential metrics must be tested and benchmarked against historic data to confirm the metric is robust

## 4.3 No Specific Normalization Approach Recommended: Further Analysis is Needed

Econometric modeling approaches investigated to date:

- Setting a target in advance based on a sales forecast model
- Comparing actual normalized sales to a pooled baseline prediction model
- “Top -down” macroeconomic modeling in evaluation literature

Significant challenges associated with developing an econometric model capable of producing reasonably precise estimates of electricity sales (forecasts/historical).

Need for further analyses by specialists:

- Investigate whether coefficient estimates derived from an econometric model could be used in setting an outcome-oriented energy efficiency target, a procedure which is expected to reduce the confidence interval.
- There may be merit in considering outcome-oriented metrics and load reduction targets that do not attempt to disaggregate energy efficiency from other behind-the-meter load modifiers including distributed generation.

## 4.4 Implications of Fuel Switching

- Mechanisms should be developed that estimate and adjust for fuel-switching, with the initial focus on “good load” from heat pumps and electric vehicles (EVs).
- Working Group proposes that outcome-oriented electric efficiency targets be set in a manner that assumes no load from beneficial heat pumps and EVs. An ex-post adjustment would be made to subtract estimated load from EVs and heat pumps to assess achievement towards targets.
- Need for further study to assess whether or not an outcome-oriented metric is likely to meaningfully incentivize fuel switches away from electricity toward fuel sources that continue to create, and may increase, carbon emissions or other forms of pollution (since under an outcome-oriented metric, such fuel switches are credited equally to load eliminated through efficiency).
- A unified metric that measures total energy usage, total energy intensity, or total carbon intensity across electricity and fuels may better align tracking of and incentives for emissions outcomes than can be done with an energy-efficiency only metric. This requires much further analysis.

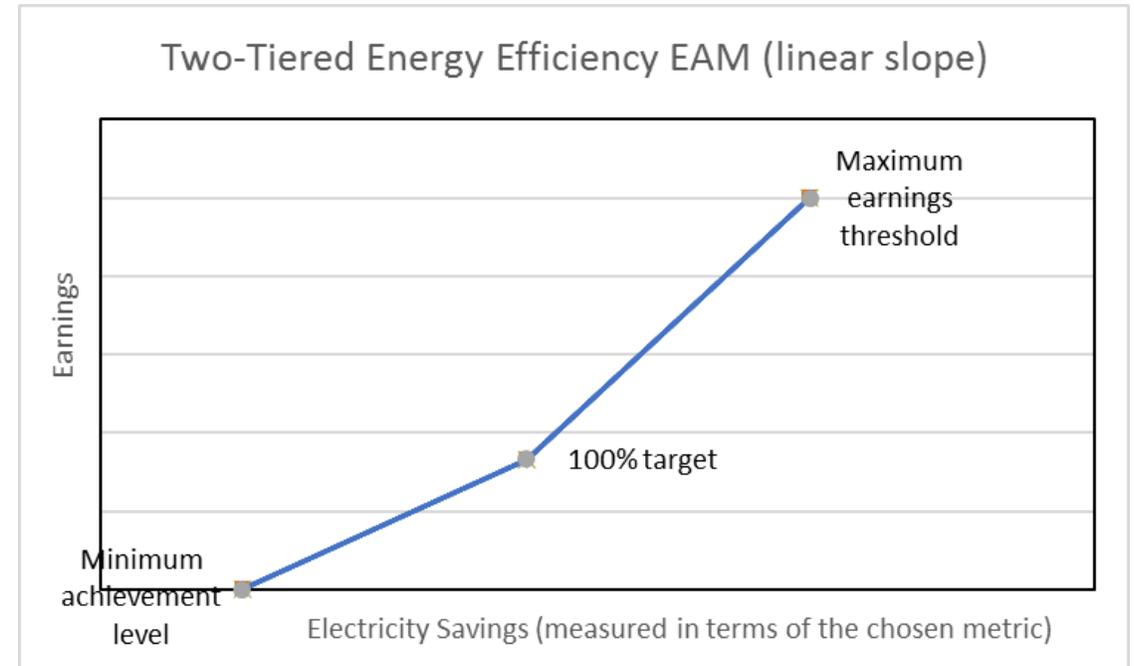
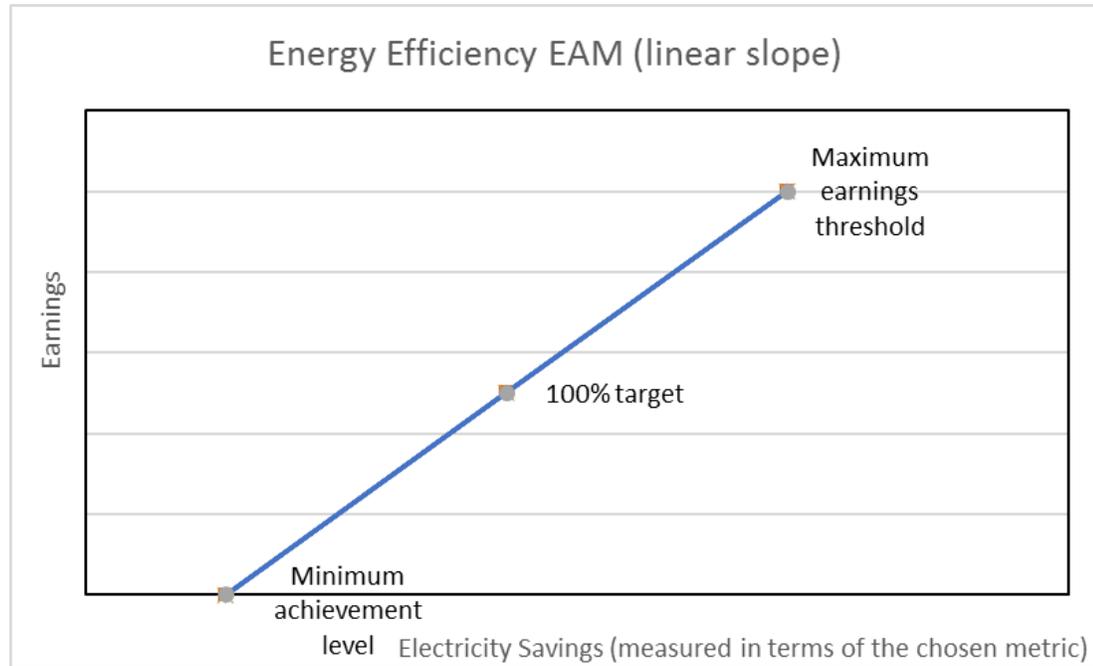
# 5. Terms to Describe an Energy Efficiency EAM

Recommend that the Commission adopt consistent term. Report uses:

1. “Minimum achievement level”: the point below which there are no earnings incentives;
2. “Maximum earnings threshold”: the point above which there are no additional earnings incentives beyond the pre-set maximum;
3. “100% target” or “target”: a pre-designated point between the minimum achievement level and maximum earnings threshold that may or may not lie at the midpoint between these two points.

A positive-only EAM does not strictly require a target. Doing so helps establish expectations for the utility and avoids ambiguity regarding whether the “target” is the minimum achievement level, the maximum earnings threshold, or some point between the two.

# 5.2.1. EAM Illustrations



# 6. Proposals for Setting and Achieving Energy Efficiency Targets

- It is premature to propose specific performance incentive targets for individual utilities, as additional work is required to specify the metric(s) used to measure progress toward the target level of performance. A starting point that some Working Group members viewed as reasonable is a metric based on total consumption within each service territory.
- There is no consensus in the Working Group regarding how statewide energy efficiency achievement levels should be developed:
  1. One approach would develop minimum statewide achievement levels that cumulatively sum to the total efficiency assumed in the CES Order by 2030. A back-loaded non-linear trajectory of MWh savings is assumed under this approach.
  2. A second approach would “ramp up” near-term 100% targets such that annual incremental energy efficiency savings as a percentage of sales increase by 0.4% per year.

# 6.1.1 Benchmarking Statewide Minimum Energy Efficiency Achievement against CES Assumptions and State Energy Plan Efficiency Goals

Year	Minimum Statewide Achievement in Cumulative GWh	Re-scaled CES Linear Projection in Cumulative GWh
2016	<i>incorporated into 2017</i>	2,375
2017	2,139	4,750
2018	4,279	7,125
2019	6,418	9,501
2020	8,558	11,876
2021	11,155	14,251

Year	Minimum Statewide Achievement in Cumulative GWh
2022	13,753
2023	16,351
2024	18,949
2025	21,547
2026	24,603
2027	27,659
2028	30,716
2029	33,772
2030	36,828

## 6.1.2 The Efficiency Ramp Up Strategy

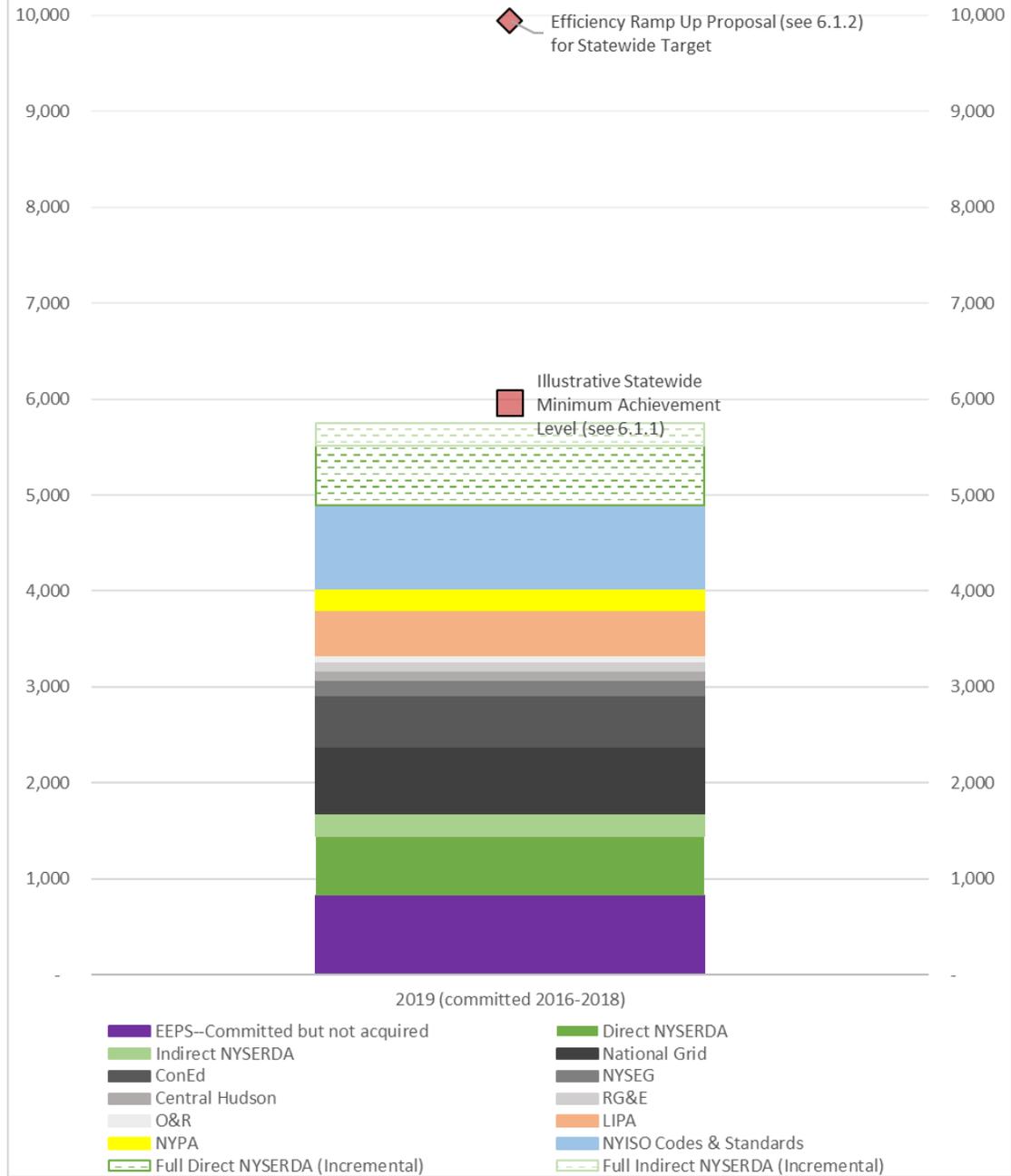
- Recommended by Working Group members including Acadia Center, Alliance for Clean Energy New York, Association for Energy Affordability, Inc., CLEAResult, Lime Energy, Natural Resources Defense Council, Pace Energy & Climate Center, Sealed, and TRC Solutions - “Efficiency Ramp Up Advocates.”
- The Efficiency Ramp Up Approach sets a 2017 savings target of 1.4% annual savings relative to the 2015 NYISO Econometric forecast, and increases near-term annual targets by .4% thereafter.
  - In the Efficiency Ramp Up Advocates’ view, an appropriate benchmark ramp up of annual incremental energy efficiency savings as a percentage of sales is 0.4% per year. A 2015 EPA study found that, on average, a group of 26 high-achieving program administrators achieved an annual increase of .38% energy savings as a percentage of sales.
  - Efficiency Ramp Up Advocates believe that adequate resources should be channeled to EE to ensure that these short-term targets are achievable; current policies do not enable achievement of these targets.
- Long term savings goals to 2030 would be set based on a new energy efficiency potential study, to be divided by service territory and take into account REV in determining the “achievable” EE.
- MA achieves nearly 3% annual incremental efficiency savings through programs alone. Taking into account the many drivers that can help achieve outcome-based targets, Efficiency Ramp Up Advocates believe long-term annual savings potential should be at least this high in NY.

# 6.1 The Joint Utility Position

The Joint Utilities Position has three elements:

1. Agreement with the Ramp Up Advocates indicating that well-funded utility programs are capable of producing greater efficiency savings than those now realized in New York.
2. The appropriate short-term approach for New York is to ramp up successful investments such as adequately funded utility efficiency programs now to prevent backsliding on targets and start the state moving on a trajectory toward the CES assumption. This position is based on a variety of considerations including:
  - The Joint Utilities' proven record of efficiency savings
  - Uncertainty related to results from untested and unproven market transformation activities
  - Historical difference between NYSERDA committed MWh savings and realized MWh savings
  - Large uncertainty of the magnitude of the projected codes and standards savings in the resource stack up
3. The precise ramp up path toward the 2030 CES goal should only be plotted after bottom up potential studies have been completed for each utility's service territory and that path should be periodically re-evaluated.

# CUMULATIVE "STACK UP" OF ESTIMATED EXISTING EE COMMITMENTS, IN 2019



## 6.3 Mechanisms to Support Energy Efficiency Achievement

- Numerous Working Group members shared the view that an increase in ratepayer funding for energy efficiency initiatives would be needed to meet State policy goals.
- Numerous members, including those from the Joint Utilities, expressed that a timely and efficient approach for narrowing the gap between current commitments and energy efficiency targets is to ramp up adequately funded utility programs to achieve savings that are above the levels reflected in the ETIPs.
- Members acknowledged the opportunity of having both resource acquisition activity and market animation and transformation activity (as NYSERDA's focus going forward) as complementary tools.
- Working Group members further noted that to be motivated to invest in standardization, market players need to see the opportunity for steady revenue streams from a market at sufficient scale. Our second report will focus on strategies to create vibrant markets for energy efficiency as an attractive business opportunity.

# 7. Analysis of the Potential Impacts of Energy Efficiency Measures on System Efficiency

- The Working group analyzed the potential impacts of energy efficiency measures on peak load reduction and load factor metrics.
- To accurately measure how energy efficiency installations affect “system efficiency” metrics it is necessary to:
  1. Develop representative hourly load impact profiles for an energy efficiency measure being installed for a specific end use in a specific customer segment (for example, a LED light bulb installation in the living room of an apartment in northeastern Brooklyn) on a peak day, and
  2. Develop an ability to aggregate such representative curves of all energy efficiency measures in a given area in order to accurately predict the overall impact of all those measures collectively at various levels of the electrical system on a peak day.

# 7. Analysis of the Potential Impacts of Energy Efficiency Measures on System Efficiency

- Energy efficiency programs in New York have traditionally been targeted at decreasing overall energy consumption (kWh).
- The Commission has outlined goals that are targeted at both carbon reduction and peak reduction.
- In order to create metrics and incentives that are not competing with each other, strategies should be designed to optimally realize the benefits of both energy efficiency and system efficiency goals, while at the same time recognizing competing factors.
- In a similar vein, a utility can leverage funding and resources available through both system efficiency and energy efficiency programs to implement measures that provide both a distribution benefit and overall energy savings.

# Summary Points: Additional Analysis Needed

- Implementation of an outcome-oriented performance incentive for energy efficiency: May set utility targets using a consumption metric that measures reduction in normalized MWh consumption for that utility's service territory as a whole. Consider "hybrid" policy that combines an outcome-based approach and a program-based approach.
- Need for further analyses by specialists to determine precise method for normalization of an outcome-oriented metric. Potential metrics must be tested and benchmarked against historic data to confirm the metric is robust.
- Mechanisms to estimate and adjust for fuel switching should initially focus on "good load" (heat pumps and EVs), with need for further study to assess potential for fuel switching away from electricity.
- Merit in further considering (1) outcome-oriented metrics and load reduction targets that span all DERs; (2) moving toward a unified metric that measures usage/intensity across electricity and fuels. Significant further analysis of potential metrics is needed.

# Summary Points (continued)

- No consensus recommendation by Working Group on an approach for setting energy efficiency targets; two different approaches put forth.
- Also markedly different views around what level of territory-wide energy efficiency savings constitutes a “realistically achievable” EAM target for an outcome-oriented metric.
- Working Group is not immediately equipped to extend its work to consider metrics and targets for natural gas efficiency, although we emphasize the importance of efficiency savings across all fuels.