NASEO-NARUC Grid-interactive Efficient Buildings State Working Group: Next Steps and Opportunities

December 18, 2019

Rodney Sobin, NASEO Danielle Sass Byrnett, NARUC Natalie Mims Frick, LBL





National Association of State Energy Officials



NARUC National Association of Regulatory Utility Commissioners



#### NASEO-NARUC GEB Working Group: Next Steps and Opportunities December 18, 2019 4:00 pm ET

Logistics:

- All attendees are muted.
- Please use the GoToWebinar question box to "raise hand" to be recognized and unmuted. If you prefer you may use the question box.

We encourage discussion and feedback during today's call.

We will welcome your thoughts/views/suggestions after this call too. Please call or e-mail as you wish:

Rodney Sobin <u>rsobin@naseo.org</u> 703-299-8800 x112 Maddie Koewler <u>mkoewler@naseo.org</u> 703-299-8800 x113

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#### NASEO-NARUC GEB Working Group Webinar

#### Agenda:

- Welcome and introduction
- Recap of Working Group activities and accomplishments
- Overview of plans for 2020
- Technical Assistance for States
- Working Group needs and interests
- Close/next steps

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#### Grid-Interactive Efficient Building Opportunities

- Advancing technologies open opportunities for more flexible building/facility load management:
  - Reduce costs, enhance resilience, reduce emissions
  - Reduce peaks, moderate ramp rates, provide grid services
  - Enhance energy efficiency
  - Integrate distributed and renewable resources



- How can we optimize facility interactions with the grid?
- How can states fashion policies, programs, and regulations to advance such optimization through GEB?
- What are roles for states, facility operators, utilities, product and service providers, and others?

- NASEO-NARUC GEB Working Group
  - Supported by U.S. DOE Building Technologies Office
  - Inform states about GEB technologies and applications
  - Identify opportunities and impediments
    - Non-technical and technical
  - Identify and express state priorities, concerns, interests
  - Recognize temporal and locational value of EE and other DERs
  - Enhance energy system reliability, resilience, and affordability

Inform state planning, policy, regulations, and programs





- Working Group co-chairs:
  - Kaci Radcliffe, Oregon Dept. of Energy
  - Hanna Terwilliger, Minnesota PUC staff

#### Working Group states:

Colorado	New Jersey
Connecticut	New York
Florida	Oregon
Hawaii	South Carolina
Massachusetts	Tennessee
Michigan	Virginia
Minnesota	Wisconsin



Additional states may join

- Accomplishments
  - Needs assessment interviews and summary
  - Webinars
    - Grid-Interactive Efficient Buildings (GEB) Initiative
    - GEB and Automated Demand Response
    - Connected Homes and the Grid Flipping the Switch on the Script (with DOE)
    - Action Steps for States: Moving Towards a Future with Demand Flexibility
    - Grid-Interactive Efficient Buildings (GEB) Case Examples
  - Meeting sessions
    - 2018 NASEO Annual Meeting
    - 2019 NASEO Energy Policy Outlook
    - 2019 NARUC Winter Policy Summit
    - 2019 NASEO Annual Meeting:
      - Roundtable and Workshop

Workshop: Nine states, peer exchange on GEB/load flexibility activities, needs



- Reports and Resources
  - GEB Briefing paper
  - Roadmapping guide
  - Pilot considerations
  - Residential GEB



https://naseo.org/issues/buildings/naseo-geb-resources



Grid-interactive Efficient Buildings: State Briefing Paper



NASEO-NARUC Grid-interactive Efficient Buildings Working Group







Roadmapping: A Tool for States to Advance Load Flexibility and Grid-interactive Efficient Buildings

NASEO-NARUC Grid-Interactive Efficient Buildings Working Group



dmapping: A Tool for States to Advance Load Flexibility and Grid-interactive Efficient



Considerations for Grid-interactive Efficient Buildings (GEB) Pilot Projects

RESIDENTIAL GRID-INTERACTIVE EFFICIENT BUILDING TECHNOLOGY AND POLICY: HARNESSING THE POWER OF HOMES FOR A CLEAN, AFFORDABLE. RESILIENT GRID OF THE FUTURE



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#### NASEO-NARUC Grid-Interactive Efficient Buildings Working Group NASEO Comments on RFI DE-FOA-0

- External Resources and Engagement
  - ACEEE Utility GEB Working Group

NASEO Comments on RFI DE-FOA-0002070: Efficient and Flexible Building Loads

National Association of State Energy Officials Comments on Request for Information (RFI) DE-FOA-0002070: Efficient and Flexible Building Loads

- State and Local Energy Efficiency (SEE) Action Network
- DOE RFI: Efficient and Flexible Building Loads
- GSA Green Bldg. Advisory Cmte.: Fed. Bldg. & Grid Integration Advice Letter
- Rocky Mountain Institute zLab
- Mid-Atlantic Distributed Resources Initiative (MADRI)

DRAFT SEE Action Report Series

Determining Utility System Value of Demand Flexibility From Grid-Interactive Efficient Buildings

GSA Green Building Advisory Committee Federal Building & Grid Integration: Proposed Roadmap Advice Letter

Grid-Interactive Efficient Building Utility Programs: State of the Market

Christopher Perry, Hannah Bastian, and Dan York October 2019 An ACEEE White Paper

- Coming year plans and thoughts
  - Working Group topical calls
  - Bimonthly webinars



- National Lab technical assistance (more later in this call)
- Working Group convening (2020 NASEO Annual Mtg, Portland, ME?)
- Briefing paper on topic TBD (informed by you)
- GEB-readiness in State and Public facilities
  - Small convening (maybe at Better Buildings Summit?)

#### What are your needs and interests?

Will inform Working Group topics and approaches.





### Technical Assistance for States: Grid-Interactive Efficient Buildings

NASEO-NARUC Grid-interactive Efficient Buildings Working Group Meeting Natalie Mims Frick and Lisa Schwartz, Berkeley Lab December 18, 2019

This presentation was supported by the U.S. Department of Energy's Grid Modernization Initiative under Lawrence Berkeley National Laboratory Contract No. DE-AC02-05CH11231



#### **Technical Assistance**

- Berkeley Lab (LBNL), National Renewable Energy Lab (NREL) and Pacific Northwest National Lab (PNNL) received funding from the U.S. Department of Energy to assist state energy offices and public utility commissions seeking to advance Grid-interactive Efficient Buildings by harnessing technologies and applications for demand flexibility from buildings shed, shift, and modulate.
  - Identifying technical and institutional opportunities and impediments to buildings providing grid services
  - Informing state planning, standards, pilots, and programs to enhance grid reliability and resilience and electricity affordability
- Technical assistance is available to members of this Working Group in 2020 and 2021
- Today we will offer a draft menu of technical assistance options for states to consider and provide select examples of potential areas and types of assistance.





- Actions to advance demand flexibility in publicly owned buildings (lead by example)
- Valuation methods for utility system planning
- Assessing potential impacts of GEBs on utility system loads
- Pilot programs to demonstrate and validate load flexibility approaches
- Performance metrics and retrospective assessments
- Best practices for building owners to tap demand flexibility in buildings
- Best practices to integrate GEBs in customer-funded utility programs
- Development of a roadmap or action plan for demand flexibility toward achieving state energy-related goals

#### **Other topics?**





#### Approach for Delivering Technical Assistance

- □ Identify first-year (2020) priority topics for states in GEB Working Group
  - Cohorts of states organized by common needs, institutional challenges and opportunities
- Select several technical assistance activities for 2020
- Create draft implementation plans for DOE approval
  - Technical assistance will be provided by lab team members, plus leading industry consultants
- At the conclusion of each activity, Berkeley Lab will document lessons learned to share with the full Working Group so all members can learn from the project.
- A webinar series covering technical and institutional topics identified by states will be available to all.
- □ We will select second-year (2021) priority topics and activities in late 2020.









# Select Examples of Potential Technical Assistance



**ENERGY TECHNOLOGIES AREA** 

**ENERGY ANALYSIS AND ENVIRONMENTAL IMPACTS DIVISION** 

- Several Working Group members expressed interest in learning more about how they can use GEBs in state buildings to lead by example.
- Potential technical assistance could:
  - Identify barriers to testing demand flexibility technologies in state buildings and potentially adopting demand flexibility performance targets or standards for these buildings
  - Develop model provisions for state building programs to integrate GEBs and demand flexibility — for example, for energy service performance contracting or benchmarking, and building performance standards
  - Identify other potential ways to overcome barriers and create an action plan to implement solutions in your state



#### **GEB Valuation in Utility System Planning**

- Members expressed interesting in understanding how to value GEBs in planning processes generation, distribution and transmission.
- BTO funded a Berkeley Lab report for state and local governments, *Determining Utility System Value of Demand Flexibility From Grid-Interactive Efficient Buildings*.
- Potential technical assistance could explore one or more of the enhanced valuation methods identified in the report for individual or cohorts of states.

	Distribution System Planning			Generation Planning		Transmission Planning	
Enhanced valuation methods to account for:	Hosting Capacity (for distributed generation capacity)	Energy Analysis (loss estimation)	Thermal Capacity (peak capacity)	Capacity Expansion Modeling	Market- Based Mechanisms	Capacity Expansion Modeling	Congestion Pricing Analysis
<ol> <li>All electric utility system economic impacts resulting from demand flexibility</li> </ol>	•	•	٠	٠	٠	٠	٠
<ol> <li>Variations in value based on when demand flexibility occurs <sup>58</sup></li> </ol>		•			•	٠	٠
<ol> <li>Impact of distribution system savings on transmission and generation system value<sup>59</sup></li> </ol>	۲	•	٩	٠	٠	٠	٠
<ol> <li>Variations in value at specific locations on the grid <sup>60</sup></li> </ol>	•	•	٢	٢	۲	•	٠
<ol> <li>Variations in value due to interactions between DERs providing demand flexibility<sup>61</sup></li> </ol>	•	٩		٩	٩	٩	٩
<ol> <li>Benefits across the full expected useful lives of the resources<sup>62</sup></li> </ol>		٩		١	٠	٠	•
<ol> <li>Variations in value due to interactions between DERs and other system resources<sup>63</sup></li> </ol>	٩	٩	٠	٠	•	•	٠

🗩 most applicable, 🕒 least applicable





#### **GEB** Pilots

- Technical assistance could explore best practices for pilot projects that advance GEBs, such as:
  - Pay-for-Performance programs (California, Oregon, New York, Massachusetts)
  - Southern Company's <u>Smart Neighborhoods</u> and Consumers Energy's <u>Jackson Smart Energy District</u>
  - Energy efficiency programs such as Massachusetts <u>active demand reduction</u> allows customers to receive energy efficiency program incentive for batteries and EVs
  - Analyzing options to avoid or defer transmission or distribution system expenditures through non-wires alternatives
  - Time-based rate designs for residential and commercial





#### Assessing Potential Impacts of GEBs on Utility System Loads

- □ Research by LBNL to date shows that in 2020, buildings could:
  - Reduce peak demand by 22-30%
  - Shift 6% (summer) to 14% (winter) of peak demand to hours when it is most needed by the grid
- Residential cooling, residential heating and commercial plug loads yield large potential savings.
- Technical assistance could explore ways to adapt the LBNL study methods to identify potential GEB impacts for cohorts of interested states.
  - The project could also consider how to incorporate GEB potential into state or utility planning.



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#### Select LBNL Resources

- Time and locational sensitive value of efficiency
  - <u>Time-Sensitive Value of Efficiency: Use Cases in Electricity Sector Planning and Programs</u> (2019)
  - Time-varying value of electric energy efficiency (2017)
  - Time-varying value of energy efficiency in Michigan (2018)
  - No Time to Lose: Recent research on the time-sensitive value of efficiency (webinar)
- □ End-Use Load Profiles for the U.S. Building Stock
  - Multi-lab project funded by Building Technologies Office to create end-use load profiles representing all major end uses, building types, and climate regions for the U.S. building stock.
  - End-Use Load Profiles of the U.S. Building Stock: Market Needs, Use Cases and Data Gaps
     End Use Load Profile Inventory
  - End-Use Load Profile Inventory
- Other Electricity Markets and Policy Group energy efficiency research
- Peak Demand Impacts from Electricity Efficiency Programs
- Energy Efficiency in Electricity Resource Planning (forthcoming)
- Locational Value of Distributed Energy Resources (forthcoming)









Natalie Mims Frick nfrick@lbl.gov 510-486-7584 Lisa Schwartz lcschwartz@lbl.gov 510-486-6315

Visit our website at: <u>http://emp.lbl.gov/</u>

Click <u>here</u> to join the Berkeley Lab Electricity Markets and Policy Group mailing list and stay up to date on our publications, webinars and other events. Follow the Electricity Markets and Policy Group on Twitter @BerkeleyLabEMP



#### Seek your views on topics for:

- Webinars, calls, exchanges
- Technical assistance

#### What are your needs and interests?

Will inform Working Group topics and approaches.

What are your top 2-3 topics

#### We also want to know what your state is doing, planning, considering in this area.

- Considering roadmaps, plans?
- Pilots/demonstrations underway or under consideration?
- Policy and regulatory actions?

#### On this call and/or

Afterwards: call or e-mail us by January 10 (though sooner is better)

We will use your views to inform topical emphases

- The Working Group approach and structure will be informed by your needs, interests
- We will always welcome your input and suggestions

We look forward to working together with you to advance GEB and load flexibility in your state.

https://naseo.org/issues/buildings/naseo-naruc-geb-working-group

Questions/inquiries:

Rodney Sobin <a href="mailto:rsobin@naseo.org">rsobin@naseo.org</a> and Maddie Koewler <a href="mailto:mkoewler@naseo.org">mkoewler@naseo.org</a>

Danielle Sass Byrnett <u>dbyrnett@naruc.org</u> and Charles Harper <u>charper@naruc.org</u>



