



# Benefits of Maine's Net Energy Billing (NEB) Program

Presentation of Report Highlights to the Maine EU&T Committee

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# Daymark conclusion on Maine's NEB program

Daymark Energy Advisors – after reviewing the Maine PUC's report on the NEB program and evaluating the value of participant solar project development – concludes that the benefits of these project to Maine exceed the net lost revenue by Maine's investor-owned utilities. These projects provide significant retail and wholesale power cost savings, emission reductions, and economic development (job creation).

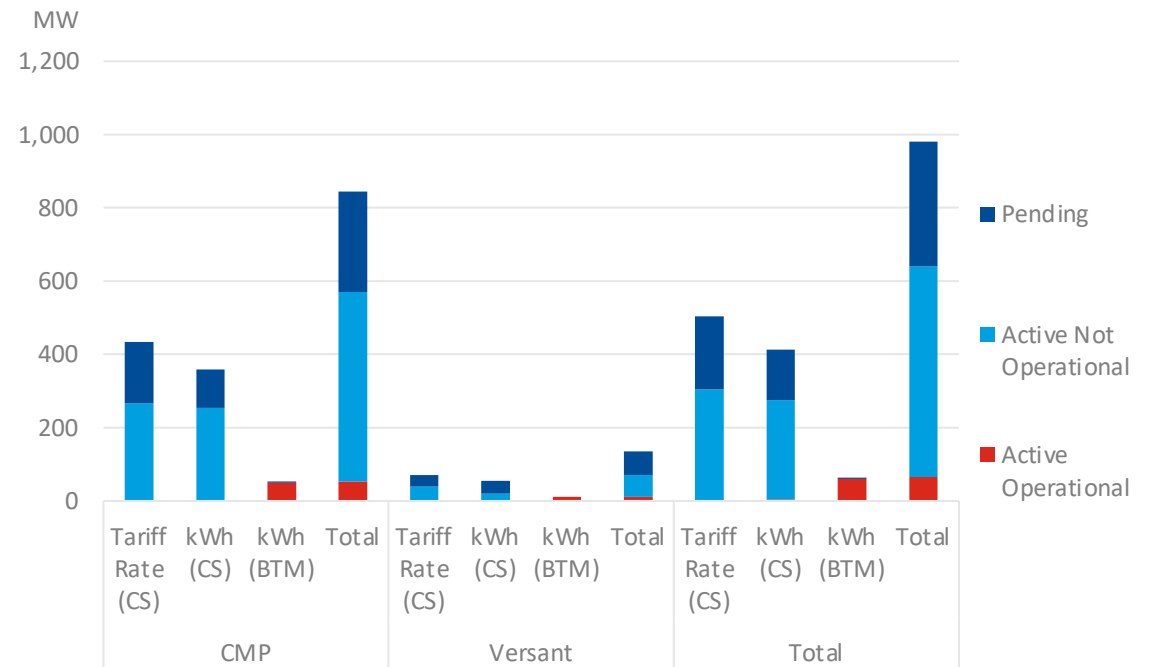
# Today's discussion

1. Success of the NEB program
2. Daymark's analysis of annual program net costs to Maine
3. Daymark's update to the value of NEB solar projects
4. Observations of the value of key NEB program characteristics

# Clean energy development

- Maine’s NEB program has successfully stimulated the development of small-scale solar projects that could reach 1,000 MW, without requiring any government or utility capital or long-term contractual commitment
- Operational projects are currently supplying just under 1% of Maine’s electric demand
- If all “Active Non-Operational” and “Pending” projects were developed, over 15% of Maine’s annual demand would be met by NEB solar
- Program is enabling the state’s decarbonization through electrification by providing emission free energy

Capacity of solar cited in the Commission report



# Stimulating Maine's economy

- The NEB program represents a large investment in Maine's economy
- The operational projects in the NEB program have supported an estimated 549 job-years and stimulated \$60 Million dollars of economic activity within Maine
- If the total pipeline of projects represented in the Commission report are completed, they would support almost 7,000 job-years and \$782 Million of economic activity in the state

Economic Impact from Operational Projects in Commission Report				
NEB program	MW	Total Capex Investment (\$ Million)	Jobs supported (job-years)	Economic Output (\$ Million)
Small BTM	60	\$205.1	518	\$56.8
Community Solar	4	\$10.1	31	\$3.5
<b>Total</b>	<b>65</b>	<b>\$215.2</b>	<b>549</b>	<b>\$60.3</b>

Economic Impact from All Projects in Commission Report (includes Operational, Active non-Operational, and Pending Projects)				
NEB program	MW	Total Capex Investment (\$ Million)	Jobs supported (job-years)	Economic Output (\$ Million)
Small BTM	64	\$219	552	\$61
Community Solar	917	\$2,085	6,430	\$722
<b>Total</b>	<b>981</b>	<b>\$2,304</b>	<b>6,982</b>	<b>\$782</b>

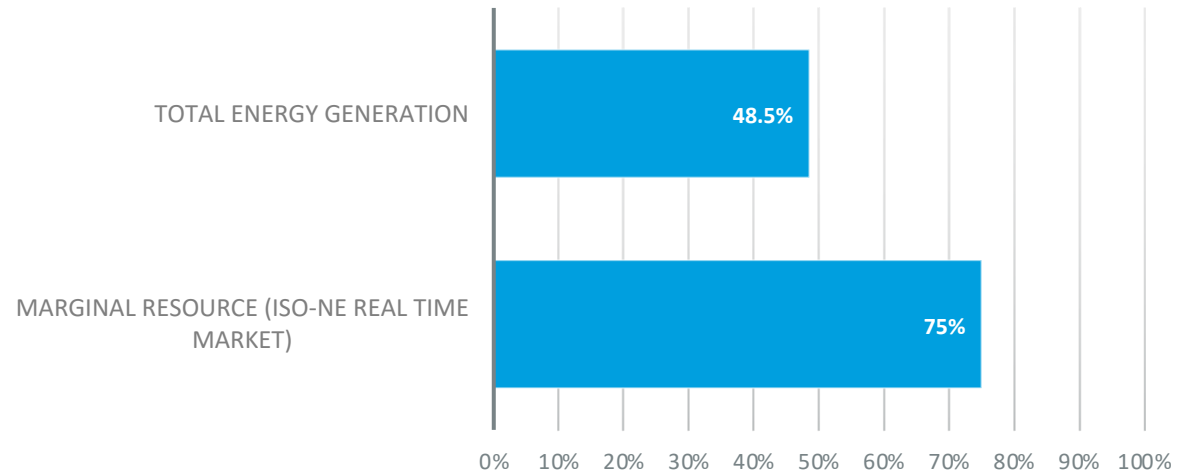
# Contributing to Maine's climate goals

## ISO-NE fuel on the margin

- Solar generation from the NEB program is displacing ISO-NE marginal resources
- Even though ISO-NE's energy is provided by a diverse combination of clean and emitting energy sources, the marginal resources are mostly gas-fired
- Operational projects are reducing 34,000 tons of carbon annually
- If all "Pending" and "Active Non-Operational" projects were operational, over 600,000 tons of carbon would be reduced annually

## ISO-NE energy mix

Percent of ISO-NE Supply from Natural Gas



## Daymark view

- There are several factors overlooked by the Commission's report
  - The loss in utility revenue is not necessarily a cost to Maine utility customers
  - The view that there are possible distribution system cost reductions or resiliency benefits that come from small-scale solar installations
  - Even if the lost utility revenue does completely flow-through to utility customers, we must realize this is a cost allocation and recovery issue related to embedded or already incurred capital and O&M costs, not additional costs to Maine
- Any shift in revenue cost recovery has been intentionally excluded from the benefit-cost evaluations of Maine's energy efficiency programs

# Daymark analysis

- The Commission view of the net impact of the NEB program narrowly defines benefits and thus understates the annual net benefit to Maine
- Does not look at the full power cost reductions from the small-scale solar facilities
  - Retail generation services savings
  - Wholesale capacity savings
  - Reductions in the prices Maine customers pay for energy and capacity through their suppliers
  - Reduction in ISO-NE charges to Maine for the Regional Transmission System
- In addition, the value of emissions reductions and economic development

## Daymark View on Program Net Benefits

	Commission	Daymark
Retail Lost Rev	\$ (61.8)	\$(61.8)
Tariff Rate Bill Credit	\$ (134.4)	\$ (134.4)
Wholesale Energy Rev	\$35.5	\$0
Wholesale Capacity Rev	\$0	\$0
Value of Solar	\$0	\$198.1
All Projects	\$(160.8)	\$1.8
Operational Projects	\$(8.5)	\$2.1
Operational + 50%		
Attrition Projects	\$(84.7)	\$2.0

\* 75% of the amount of T&D charges for the equivalent solar energy and 100% of the retail generation service charges at standard offer



## Daymark study



### Daymark scenarios study

- The Commission report understated the benefits of the NEB program
- This study develops an outlook of the benefits of solar and a net benefit analysis for four scenarios of solar penetration in the NEB program:
  - 2021: Solar penetration of 10% of peak load
  - 2030: Solar penetration of 10% of peak load
  - 2030: Solar penetration of 25% of peak load
  - 2030: Solar penetration of 40% of peak load
- The study is a snapshot of benefits in each scenario year

### Objectives

- Create an analysis that can inform the Commission on the full benefits of the NEB program
- Determine the benefits the NEB solar projects create for the bulk power system, the environment, and the Maine economy
- Capture any differences created whether the projects and participants participate in the kWh or Tariff Rate Programs

# Components included in net benefit analysis

COMPONENT	DESCRIPTION	NEB PROGRAM?
Avoided Energy	Market energy purchases avoided due to distributed solar for kWh program or wholesale market value of solar for Tariff Rate program	Both kWh and Tariff Rate
Avoided Capacity	Market capacity purchases avoided due to distributed solar for kWh program or wholesale capacity market value of solar for Tariff Rate program	Both kWh and Tariff Rate
DRIPE	Indirect effects of solar on market prices for energy and capacity	Both kWh and Tariff Rate
Avoided RNS Charges	Reductions in Maine’s share of ISO-NE’s Regional Network Services Charge	kWh Only
RPS Benefit	Reductions in an entity’s requirements to comply with RPS policies	kWh Only
Environmental Benefits	Value of reductions in air pollutant emissions	Both kWh and Tariff Rate
Economic Benefits	Benefits to Maine’s economy from solar development	Both kWh and Tariff Rate

# Scenario results



- All four scenarios show net benefits
- The kWh program is providing net benefits and the Tariff Rate program is providing net costs
- The difference in net benefit between the two programs is due to the distinction between the programs that treats kWh projects as load reducers and Tariff Rate projects as generators

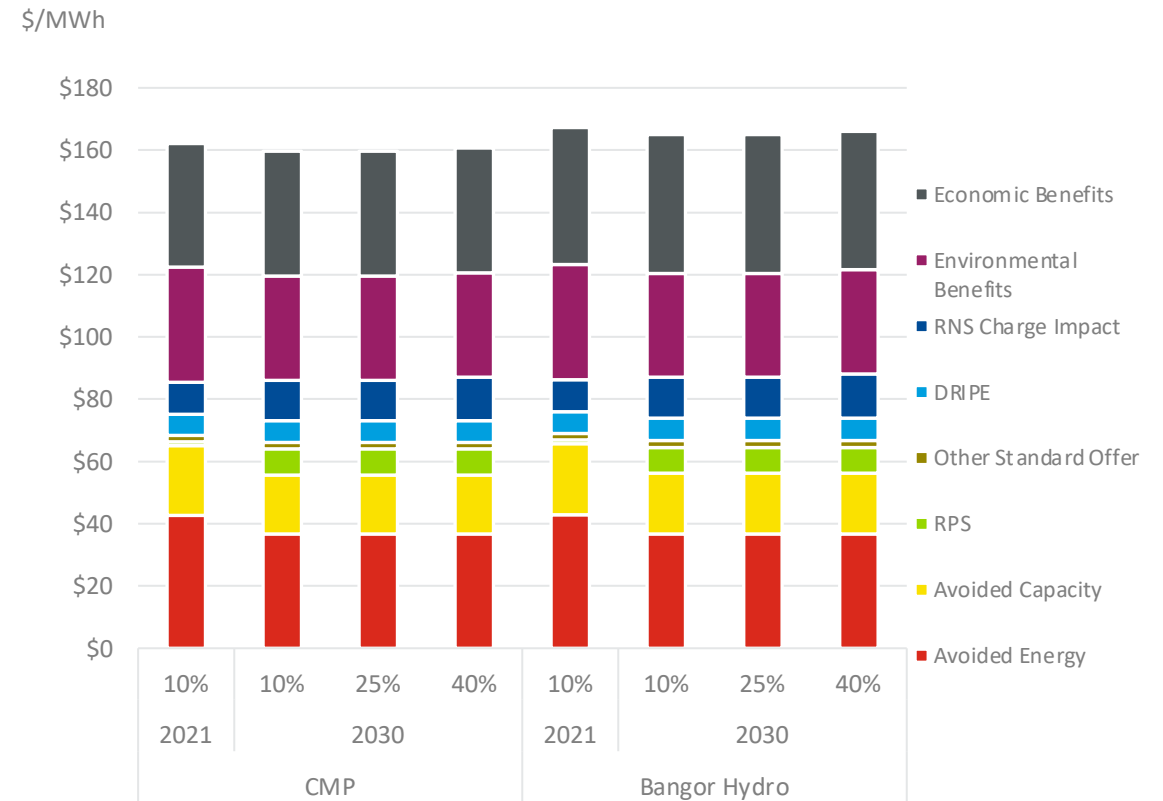
Annual Net Benefit By Scenario (Million \$2021)

SCENARIOS	SCENARIO 1 10% BY 2021	SCENARIO 2 10% BY 2030	SCENARIO 3 25% BY 2030	SCENARIO 4 40% BY 2030
CMP - kWh	\$3.2	\$7.1	\$17.8	\$29.0
CMP -Tariff Rate	(\$1.0)	(\$1.7)	(\$4.2)	(\$6.7)
<b>Total CMP</b>	<b>\$2.2</b>	<b>\$5.4</b>	<b>\$13.6</b>	<b>\$22.2</b>
BHE - kWh	\$0.1	\$0.3	\$0.7	\$1.3
BHE -Tariff Rate	(\$0.4)	(\$0.6)	(\$1.6)	(\$2.6)
<b>Total BHE</b>	<b>(\$0.3)</b>	<b>(\$0.3)</b>	<b>(\$0.9)</b>	<b>(\$1.2)</b>
ME - kWh	\$3.3	\$7.4	\$18.5	\$30.3
ME -Tariff Rate	(\$1.4)	(\$2.3)	(\$5.7)	(\$9.3)
<b>ME Total</b>	<b>\$1.9</b>	<b>\$5.1</b>	<b>\$12.8</b>	<b>\$21.0</b>

### 3. Benefits of NEB kWh Program

- Over 55% of the value of the solar generator comes from reducing electric costs to Maine
- KWH projects derive their energy and capacity benefits at the retail transaction level by avoiding energy, capacity, RPS compliance and other ISO-NE charges to Load Serving Entities
- The remaining 45% comes from the impacts of reducing emissions and creating economic activity

### Total Benefit: kWh Program

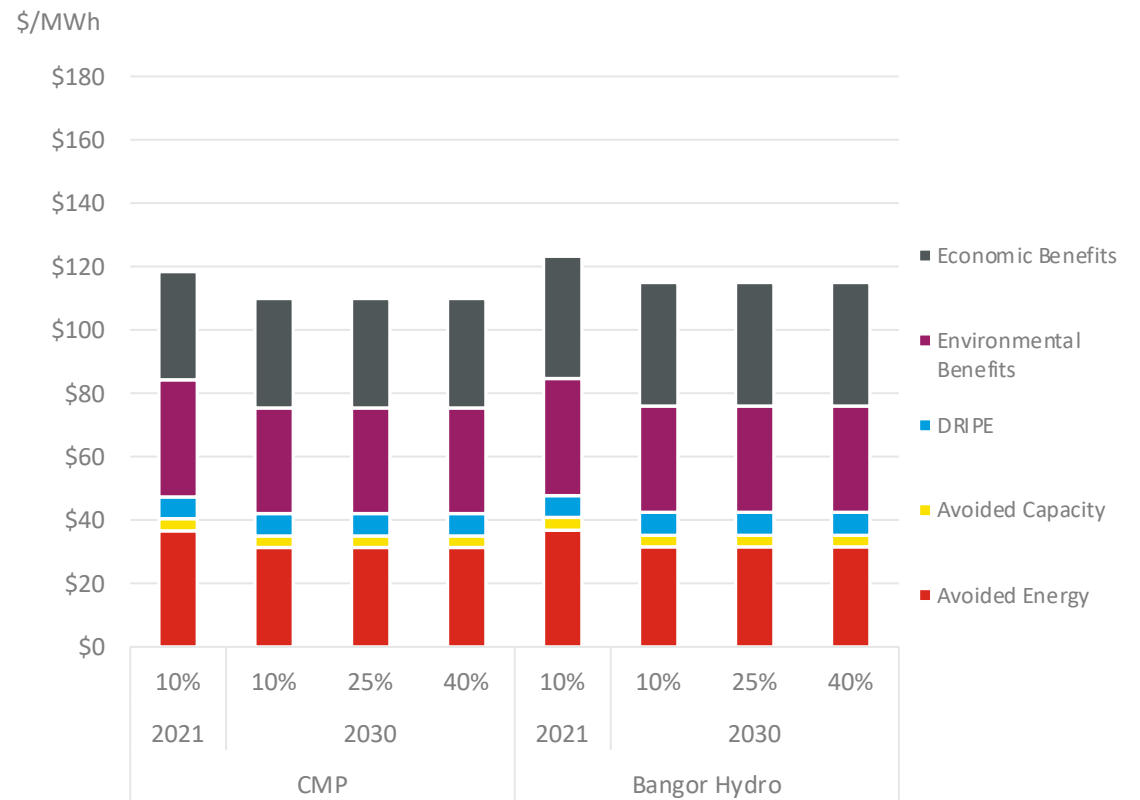


### 3. Benefits of NEB

## Tariff Rate Program

- Tariff Rate projects derive their energy and capacity benefits at the wholesale transaction level, which is less than the retail benefits of the kWh projects. As generators, the Tariff Rate projects do not:
  - Reduce the amount of renewable energy credits required for compliance with the RPS
  - Reduce Maine’s charges for regional transmission (RNS)
- Nearly 60% of the value of the solar generator comes from the economic and environmental impacts, which are the same as the kWh program

### Total Benefit: Tariff Rate Program



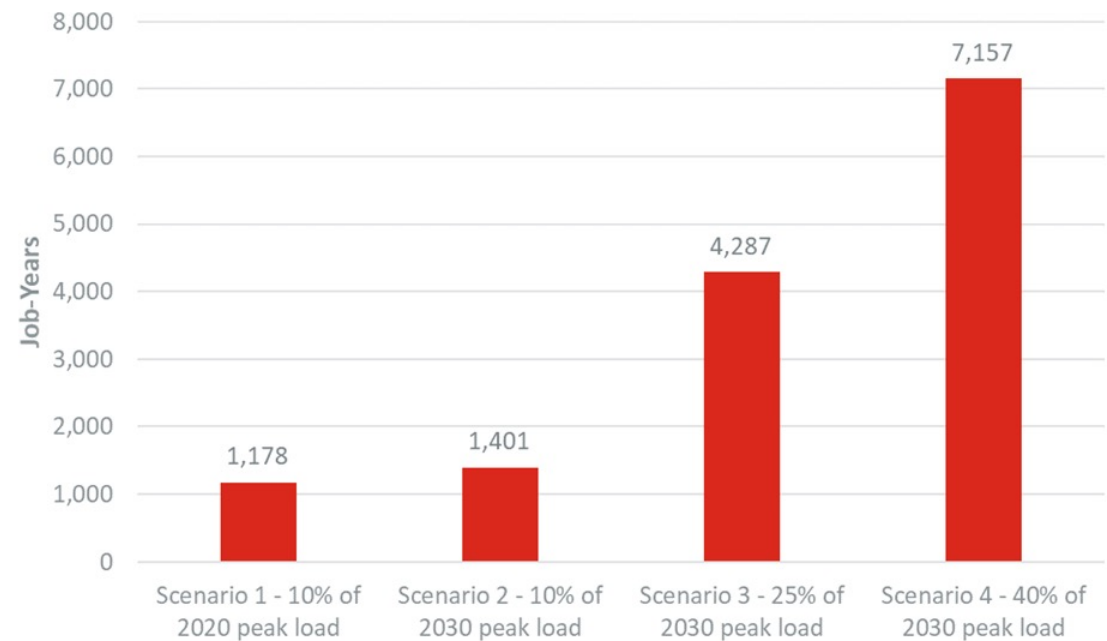
## Solar development fuels the economy

- The NEB program has the potential to make a material impact on Maine’s economy as solar development takes off in the state
- To quantify that benefit, we conducted an analysis of the impact of the NEB program on Maine’s economy
- We used the IMPLAN model for this analysis. IMPLAN is an input-output model that combines various region-specific datasets and their underlying relationships to estimate the economic impacts caused by an investment or other actions that cause an increase in sales to local industries
- Daymark used analysis-by-parts method to accurately account for Maine-specific investments in different sectors such as construction and installation labor, as well as marketing, administration, and business management functions associated with the solar development

## Solar development will support significant employment in Maine

- Daymark’s analysis evaluated employment benefits in two different ways: jobs supported (job-years) and associated employment compensation
- All four scenarios modeled produced significant economic benefits to the State of Maine
- If NEB solar reaches 10% of 2030 peak demand, it will support around 1,400 jobs; if NEB solar reaches 40% of 2030 peak demand, these activities will support around 7,100 jobs

Total Employment supported by NEB Solar Development



# Economic development

*Not to be presented at legislative committee meeting to save time*

## Total economic benefits are substantial

- Direct benefits come from the activity to market, develop, and construct or install the solar facilities considered in the NEB program
- Indirect benefits arise from the business-to-business transactions that are inherent within an industry's supply chain *(for example, should a solar developer hire a contractor, and the contractor in turn leases a crane resulting in an indirect benefit to the crane supplier)*
- Both the direct and indirect activities also create tax revenues for Maine and local governments. The municipal tax benefits is negative due to tax exemption to the developers and the state reimbursing half of the tax to Munis.
- The Daymark analysis applied a conservative approach by only including the direct benefits in the value of solar estimation

## Total benefits from development

**Figure 8. Detailed economic benefits by modeled Scenarios**

Description	Scenario 1 - 10% of 2020 peak load	Scenario 2 - 10% of 2030 peak load	Scenario 3 - 25% of 2030 peak load	Scenario 4 - 40% of 2030 peak load
<b>Total Solar Installed Capacity (MW)</b>	161	191	577	962
<b>Economic Benefits</b>				
<i>Direct Impact</i>				
Employment (Job Years)	1,178	1,401	4,287	7,157
Labor Income, PV \$ Millions	\$77.9	\$87.2	\$266.6	\$445.2
Output, PV \$ Millions	\$131.5	\$146.9	\$448.7	\$749.3
<i>Indirect Impact</i>				
Employment (Job Years)	554	656	2,014	3,361
Labor Income, PV \$ Millions	\$28.3	\$31.8	\$96.4	\$160.9
Output, PV \$ Millions	\$41.4	\$45.9	\$139.9	\$234.2
<b>Tax Benefits</b>				
<i>Direct Impact</i>				
State Tax	\$3.34	\$3.73	\$11.4	\$19.1
County Tax	\$0.09	\$0.10	\$0.30	\$0.50
Municipal Tax	-\$0.75	-\$0.83	-\$2.57	-\$4.30
<b>Total Direct Tax, PV \$ Millions</b>	<b>\$2.68</b>	<b>\$2.99</b>	<b>\$9.2</b>	<b>\$15.3</b>
<i>Indirect Impact</i>				
State Tax	\$2.72	\$3.02	\$9.06	\$15.11
County Tax	\$0.12	\$0.14	\$0.41	\$0.68
Municipal Tax	-\$1.06	-\$1.17	-\$3.48	-\$5.8
<b>Total Indirect Tax, PV \$ Millions</b>	<b>\$1.79</b>	<b>\$1.98</b>	<b>\$6.0</b>	<b>\$10.0</b>



## 4. Observations of the value of key NEB program characteristics

- The ***load reducing treatment*** provides significantly greater value as compared to needing to treat participating projects as generators
- The ***value of energy and capacity must be maximized*** for the Tariff Rate projects, currently the responsibility of the utilities
- The multiple attributes of electric power, ***emissions reductions, and economic development benefits*** all need to be considered when evaluating the degree of success at the program
- Utilities need to ***re-engineer their distribution planning*** to capture the capital savings from the presence of the small-scale solar projects and to develop the value of increased system resiliency

# Thank you

## Let's continue the conversation

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## Two options to reduce energy costs

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legislative committee meeting  
to save time*

### kWh Program (load reducers)

- Either directly reduce a participants metered usage (BTM) or through a credit of kWh (Community Solar)
- Save money through the reduction in the amount of full requirements retail generation service
- Reduce the prices paid by all Mainers for energy and capacity
- Reduce the amount of renewable energy credits necessary for Maine's RPS

### Tariff Rate Program (generators)

- The participants benefit through a utility provided bill credit for the community solar they have purchased at a rate set by the PUC
- Receive wholesale revenues from participation in the ISO-NE energy and capacity markets
- Reduce the prices paid by all Mainers for energy and capacity

# Commission report view

*Not to be presented at legislative committee meeting to save time*

- The NEB program has two different programs
  - kWh Program – solar facilities reduce the electric load in Maine
  - Tariff Program – solar facilities provide capacity and energy to the ISO-NE markets
- Projects can be (1) customer sited, behind the meter (BTM), or (2) community solar, distribution-system connected.
- Tariff Program customer participants receive bill credits from the utilities at a rate\* set by the PUC
- Utilities have the obligation to obtain maximum value for the energy and capacity of the tariff rate solar generator

**Commission View on Program Net Benefits**

	<b>CMP</b>	<b>Versant</b>	<b>Total</b>
Retail Lost Revenue	\$ (50.4)	\$ (11.4)	\$ (61.8)
Tariff Rate Bill Credit	\$ (98.2)	\$ (36.3)	\$ (134.4)
Wholesale Energy Revenue	\$ 26.8	\$ 8.7	\$ 35.5
Wholesale Capacity Rev	\$ 0	\$ 0	\$ 0
Utility Shortfall	\$ (121.8)	\$ (39.0)	\$ (160.8)

\* 75% of the amount of T&D charges for the equivalent solar energy and 100% of the retail generation service charges at standard offer

## Benefits not included in Daymark analysis

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- Avoided distribution investments
- Avoided transmission network investments
- Benefits to customers who participate in the NEB Program
- Benefits from grid upgrades made to accommodate the NEB solar and paid by NEB developers