

PREPARED BY GDS ASSOCIATES, INC.

# Efficiency Maine Trust

*Response to Request for  
Information (RFI) on Efficiency  
Maine Trust Triennial Plan V  
(Fiscal Years 2023-2025)*

**April 9, 2021**





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April 9, 2021

Michelle Turner  
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**RE: Request for Information (RFI) on Efficiency Maine Trust Triennial Plan V (Fiscal Years 2023-2025)**

Dear Ms. Turner:

GDS Associates, Inc. ("GDS") is pleased to submit the enclosed response to the Request for Information (RFI) on Efficiency Maine Trust Triennial Plan V (Fiscal Years 2023-2025). We are a multi-service consulting and engineering firm. Formed in 1986, GDS now employs a staff of more than 190 in eight locations across the U.S. Our broad range of expertise includes electric, gas, water, and wastewater utilities. GDS consultants are recognized as industry experts and leaders who combine years of technical knowledge with state-of-the-art technology to address tough industry problems in the utility and energy space.

Should you have any questions about the supplied information, you may contact me via email at [dick.spellman@gdsassociates.com](mailto:dick.spellman@gdsassociates.com) or at (770) 799-2430. We also invite you to visit our website at [www.gdsassociates.com](http://www.gdsassociates.com).

Sincerely,

Dick Spellman  
Executive Consultant



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## Response to RFI Question #1: New construction program design

In the upcoming triennial plan, the Trust may consider dedicated New Construction programs in both commercial and residential sectors. In the commercial sector, program administrators (PAs) in New Hampshire, Connecticut, and Massachusetts have recently collaborated to develop a multi-tiered new construction program that is designed to encourage early engagement with the programs and promote whole building energy utilization index (EUI) reduction. This approach rewards projects that engage early in design with incentives and technical assistance and is designed to move more projects toward being net zero ready. The newly redesigned program offerings also offer pathways for smaller projects or those that engage later in the process, so no one is left behind. Those later pathways are more prescriptive in nature and without the same level of incentive.

On the residential side, GDS Associates, Inc. (GDS) has been involved with new construction programs in both New Hampshire and Massachusetts for many years that have been cost effective despite increasingly stringent codes and industry standard practice. We have found that by engaging builders in the programs to reach beyond code, overall compliance in general is improved. As the Trust approaches the next triennial plan we recommend that the current level of compliance with the Maine Uniform Energy Code be considered. While developers have a technical obligation to meet the code, the reality is that many do not and the code is loosely enforced in many jurisdictions. Just as commercial new construction programs in other states are raising lighting baselines beyond code to reflect actual market conditions, it would be fair and realistic for the Trust to recognize the current level of non-compliance with energy code and consider that as a baseline from which program performance is measured. This is a topic that multiple jurisdictions have wrestled with recently including New Hampshire in the recent formation of their three-year plan. There are established processes for measuring baseline compliance and then claiming attribution of savings for moving the market above these benchmarks. Similarly, there is precedent in Massachusetts for program administrators to support and advocate for stretch codes and to claim attribution for those efforts.

## Response to RFI Question #4: Evaluation budgets

A December 2012 Report, titled Energy Efficiency Program Impact Evaluation Guide, from the SeeAction Network provides useful information on how much should be spent on program evaluation. This report states that a reasonable spending range for evaluation (impact, process, and market) is 3% to 6% of a portfolio budget. However, this should be considered rough guidance, because evaluation needs and the relative EM&V roles of program administrators and independent third-party evaluators (and thus how the budget is categorized between program and evaluation expenses) vary significantly between different states and different program administrators. In general, on a unit-of-saved-energy basis, costs are inversely proportional to the magnitude of the savings (i.e., larger projects have lower per-unit evaluation costs) and are directly proportional to uncertainty of predicted savings (i.e., projects with greater uncertainty in the predicted savings warrant higher EM&V costs).

This SeeAction Network report provides information on the EM&V budgets of various states and program administrators. For the program administrators included in this analysis, looked at in total, for natural gas and electricity programs, the average percentage of program budget spent on EM&V in 2011 was about 3.6%. This SeeAction Network report can be found at the following URL:

[https://www7.eere.energy.gov/seeaction/system/files/documents/emv\\_ee\\_program\\_impact\\_guide\\_0.pdf](https://www7.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf)

## Response to RFI Question #5: Benefits and costs of energy and conversation measures

### **Consider Including Non-Energy Benefits in the Calculation of Efficiency Maine's Cost Effectiveness Test**

The 2018 U.S. Environmental Protection Agency report titled "Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy: A Guide for State and Local Governments" identifies and quantifies the many non-energy benefits of energy efficiency and renewable energy to support the development and implementation of cost-effective energy efficiency and renewable energy initiatives. The primary cost effectiveness test used by Efficiency Maine for energy efficiency programs does not consider many of these non-energy benefits. GDS recommends that Efficiency Maine consider working with interested stakeholders and the Maine Public Utilities Commission to recognize non-energy benefits that can be quantified. Listed below are examples of the types of non-energy benefits that GDS recommends be considered in the Maine cost effectiveness test.

### **Additional Electric System Benefits for Increased Security and Portfolio Diversity:**

- *Better reliability and power quality:* The electric grid is more reliable if it is under less stress during peak hours, especially in regions where transmission is constrained. Integrating energy efficiency and onsite renewables can increase the reliability of the electricity system, because power outages are less likely to occur when the system is not strained; diversify the generation mix, making the system less vulnerable to outages; and potentially enhance power quality, which is important for the operation of some electrical equipment. For example, energy storage can be used to store excess renewable energy for later use; it can be installed close to where energy will be consumed, potentially alleviating congestion on T&D systems during peak periods. Storage technologies with rapid response capabilities can also be used to help manage fluctuations on the electricity grid caused by the intermittency of some renewable energy resources. Due to their flexibility and ability for rapid response, system operators are exploring automated demand response and storage for better integrating distributed renewable energy resource.
  - *Avoided risks related to long lead-time investments:* Decisions to construct new electricity generating units are based on long-term projections of energy demand and electricity sale prices and it is expected that power plants will operate for long periods of time, often as long as 40 years, to fully recover construction and operating costs. Although energy efficiency and renewable energy resources certainly have some risk (e.g., underperformance compared with expectations), they can be attractive alternatives due to their modular nature and their relatively quick installation and disconnection time.
  - *Reduced risk by deferring investment in traditional, centralized resources until environmental policies take shape:* Utilities prefer certainty around future legislative and regulatory policies before investing in large, traditional electricity resources. Uncertainty creates risks. As noted above, energy efficiency and renewable energy resources are typically developed at a smaller scale than traditional, centralized resources, and provide an incremental approach to deferring decisions on larger, more capital-intensive projects.
  - *Improved fuel diversity:* Utilities that rely on a limited number of power sources can be vulnerable to price, availability, and other risks associated with any single fuel source.

In contrast, the costs of energy efficiency and most renewable energy resources, such as solar or wind, are relatively unaffected by prices of other fuels and thus provide a hedge against price spikes. The greater the diversity in technology, the less likelihood of supply interruptions and overall reliability problems.

- *Strengthened energy security:* Due to its critical importance in providing power to the U.S. economy, the electricity system is vulnerable to attacks and natural disasters. Using diverse domestic energy efficiency and renewable energy resources bolsters energy security by reducing the vulnerability of the electricity system when attacks or natural disasters occur.

**Emissions and health benefits:** Fossil fuel-based electricity generation is a source of air pollution that poses risks to human health, including respiratory illness from fine-particle pollution and ground-level ozone (U.S. EPA, 2016a). The burning of fossil fuels for electricity is also the largest source of greenhouse gas (GHG) emissions from human activities in the United States, contributing to global climate change (U.S. EPA, 2017). Improving energy efficiency and increasing the use of renewable energy can reduce fossil fuel-based generation and its associated adverse health and environmental consequences. Quantifying such environmental and health benefits should be considered in the cost effectiveness test used by Efficiency Maine.

**Economic benefits:** Many of the electricity system, emissions, and health benefits yield overall economic benefits to the state. These benefits include savings in energy and fuel costs for consumers, businesses, and the government; new jobs in, profits for, and tax revenue from companies that support or use energy efficiency and renewable energy, such as construction, manufacturing, and services; and higher productivity from employees and students taking fewer sick days.

GDS recommends that Efficiency Maine work with interested stakeholders and the Maine PUC to consider revising Maine's cost effectiveness tests to include the types of non-energy benefits listed above.

## Response to RFI Question #6: Workforce development

Increasing the adoption of energy efficiency upgrades in Maine's homes and businesses requires a skilled and qualified workforce. The state has a pool of dedicated trade allies who already provide quality services for the Efficiency Maine programs; however, as savings and participation goals increase over the next triennial plan, this labor pool must expand to meet the demand for highly skilled energy efficiency and demand reduction workers across the state. A successful Workforce Development Strategy in Maine will result in measurable improvements to the number of energy efficiency (EE) projects completed by trade allies, and tangible economic benefits to the state. GDS has experience in developing and implementing workforce development and training plans in surrounding states.

A comprehensive and coordinated workforce development plan must include short-, medium-, and long-term strategies. Short-term strategies focus on building skills and capacity of the existing workforce through technical and business training. Medium-term strategies focus on supporting the development and growth of new businesses and establishing pathways to energy careers that include work-based learning opportunities. Long-term strategies aim to excite the next generation of workforce and educate them about the opportunities that exist in this growing field. Done well, these entrants will have access to established pathways that will train them technically and connect them with employers.

To achieve the goals in the next triennial plan, Maine should consider targeting a broad cross section of participants and pursue more comprehensive projects. They will need to rely on a knowledgeable and available pool of trade allies who themselves have access to a qualified and motivated set of new entrants as business demands grow. Trade allies are the life blood of energy efficiency programs. A successful workforce development and training program will simultaneously build the pool of qualified resources and stimulate said trade ally's participation in Efficiency Maine programs.

## Response to RFI Question #7: Improving equity

GDS supports the Trust's priority of advancing equity in the delivery of its programs. One area that other jurisdictions have focused on recently that the Trust may consider in the next triennial plan is to prioritize equity in workforce development. It is widely understood that to achieve ambitious savings and climate goals, a robust energy workforce is needed. That effort involves both the training and upskilling of existing workers in new areas like electrification as well as engaging new entrants to the energy workforce. A more demographically and geographically diverse workforce is necessary to address the full range of customers and their needs in all customer sub-sectors, and all regions – particularly in a state like Maine. Identifying opportunities to engage workers from disadvantaged or high unemployment communities could be an impactful aspect of the next triennial plan.

## Response to RFI Question #8: Successful load management initiatives from other jurisdictions

There are many examples of successful load management initiatives that have been implemented in other jurisdictions. Listed below are descriptions of six successful load management programs that were recognized by the Peak Load Management Alliance in April 2020. Additional examples of successful load management programs recognized by the PLMA can be found at <https://www.peakload.org/past-winners>.

### **National Grid and EnergyHub for National Grid ConnectedSolutions**

National Grid's ConnectedSolutions program is the nation's first pay-for-performance-based Bring-Your-Own-Battery Demand Response (DR) program. The program has shown how to cost-effectively incentivize customers to purchase batteries and allow the utility to discharge those batteries to reduce peaks on the grid. The program provides residential, commercial, and industrial battery owners across Massachusetts and Rhode Island with incentives from \$200-400/kW-performed per year in exchange for providing battery capacity to support a more sustainable and efficient grid. The program embraces consumer choice by enabling participation with battery integrators from Tesla, Sunrun, Generac, SolarEdge, and Sonnen through an integration with a single Distributed Energy Resource Management System (DERMS) platform provided by EnergyHub. With the goal of enrolling 17 MW of load relief by the end of 2021, the program is on track to provide more than \$15,000,000 per year in system benefits, which will reduce costs for all customers. This program started as a National Grid program, but it has been so successful that it has since been adopted by Eversource and Unitil. These utilities work together to offer one consistent program for customers.

## **Arizona Public Service and EnergyHub for APS Distributed Energy Resource Aggregations (Rewards Programs and Solar Communities)**

Arizona Public Service (APS) has implemented programs that reimagine the relationship between a utility and distributed energy resources (DERs) and that will be instrumental in its commitment to achieve 100% clean energy by 2050. APS uses EnergyHub's Mercury DERMS platform to dynamically manage a portfolio of grid-edge assets including thermostats, batteries, water heaters, and solar inverters for an array of grid services. APS leverages DERs for peak demand reduction, load shifting and renewables matching, solar management, and advanced load and capacity forecasting. Services are available year round, multiple times a day, unlike event-based calls for DR. They have implemented these programs with both bring-your-own and direct install models. APS has evolved from a DERMS early-adopter to a pioneer of a customer-centric approach to managing the grid.

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### Technology Pioneer

#### **Connected Energy (UK) Ltd for Battery Recycling in Belgium**

Connected Energy (UK) Ltd.'s system installed at the Umicore industrial site in Belgium reuses Renault Kangoo batteries which previously powered 48 vehicles in France. The system provides a frequency response service to Elia, the Belgium system operator, to help it balance electricity supply and demand for network stability. It is the first time 'second-life' batteries have been used at an industrial scale in this way in the country. The batteries have a combined energy storage capacity of 720 kWh and can deliver 1.2 MW in power. With solution project partner ENGIE, the battery is optimized in real-time as part of a synchronized asset stack providing revenue generation and power quality management for global materials technology and recycling group Umicore who also recycle EV batteries. The installation will give the company insight into the process of wear in the batteries, which can help to build better batteries.

#### **Austin Energy for Austin SHINES Project**

The Austin SHINES project (Sustainable and Holistic Integration of Energy Storage and Solar PV) pilots the integration of utility-scale, commercial, and residential resources on the distribution grid and under the holistic coordination of a DERMS platform (Distributed Energy Resource Management System). The DERMS was provided and developed with the utility's project partner, Doosan GridTech, and performs as a tool enabling varied and stacked asset management use cases. In addition to controlling fielded assets, of solar PV and battery energy storage, at both utility and aggregated customer sites, the software helps model different mixes and configurations of assets to determine the best value proposition against cases of holistic controls, autonomous and no controls of DERs (Distributed Energy Resources). Hands-on deployment, in combination with modeling, has offered a rich field from which to gather a better understanding of the opportunities, challenges, and realities of DER integration that pioneers a new gridscape. The methodology for management was documented as a replicable and configurable technique to serve other utilities, across multiple jurisdictions.

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### Thought Leader

#### **CPS Energy for Public Engagement**



Recognizing the need to protect their customers from potential increase in energy costs resulting from projected peak load demands and megawatt availability in the ERCOT market, CPS Energy's leadership challenged the Demand Response (DR) team to grow the company's DR program for summer 2019 by 28 megawatts. The team created a plan to grow through behavioral DR, wifi thermostats, and both commercial and public customer engagement. Multiple new program options were created or expanded, including DR Coaching for commercial customers and an expanded behavioral DR program to 300,000 residential customers. To achieve this goal, a public engagement campaign engaging a local news station was created. The plan focused on adding an energy peak awareness message as part of the weather segment of the newscast. When a DR event was anticipated, the weather reporter would encourage viewers to lower energy usage throughout the day. At the end of the day, a follow up thank you message was announced during the nightly newscast. Through this effort of directly engaging the customer, CPS Energy exceeded the goal by adding over 40 MWs of DR to the portfolio. To promote friendly competition, customers in the program were able to see their kwh reduction versus their neighbors and where they ranked in energy savings.

### **City of New York, Department of Citywide Administrative Services for Building Operator Engagement**

The NYC Department of Citywide Administrative Services (DCAS), through its Division of Energy Management, had the vision to expand an initial electricity-only Demand Response program that encompasses 470 facilities across 30 city agencies and institutions. It's the single largest contributor to grid relief in the New York Independent System Operator (NYISO) NYC Zone J territory. In addition to Demand Response, DCAS's work expanded to include Real-Time Metering (RTM) and Load Management programs. The RTM program has deployed near-real time metering for electricity use across 500 facilities, monitoring 55% of municipal peak load. The program now also includes monitoring of gas and steam usage. To help drive these programs, DCAS partnered with NuEnergen to develop data visualization tools, offer mobile access, and provide training opportunities. DCAS has also created a dedicated, in-house team with engineering and analytical expertise, undertaken proactive relationship management with facility operators, launched hands-on, peer-driven learning environments in partnership with the City University of New York's Building Performance Lab, and offered staff recognition of outstanding efforts.