

The **Onsite Renewable Energy and Storage** Working Group met over the course of seven sessions to review onsite energy technologies, discuss procurement, implementation, and operational strategies, identify barriers to onsite renewable energy and storage deployment, and establish best practices and highlight success stories to overcome barriers identified. The working group also included two sessions with peer-to-peer case study presentations highlighting partners' lessons learned during the implementation of onsite solar PV, solar thermal, and battery storage technologies.

KEY TAKEAWAYS

- ▶ Industrial Better Climate Challenge partners have mostly deployed solar photovoltaic (PV) and combined heat and power (CHP) systems at their facilities but are interested in adding other technologies, including battery storage and thermal storage, to their facilities.
- ▶ The biggest barriers hindering onsite energy implementation at industrial sites are:
 - the cost of technology installations
 - space limitations for renewable energy projects at their sites (mostly for solar PV and distributed wind), and
 - regulatory constraints.
- ▶ Partners noted that their biggest needs for determining the most suitable financing option for onsite energy projects are:
 - understanding how the different financing mechanisms compare to one another,
 - drafting requests for proposals (RFP), and
 - evaluating proposed costs and designs in response to RFPs.
- ▶ Reducing energy costs is the primary motive for partners to implement onsite energy technologies and a leading criterion for evaluating a portfolio of sites.

Discussion Topics and Outcomes

Discussions covered topic areas such as portfolio screening, building an effective team, site and technology screening, engaging with the local utility, detailed feasibility studies and requests for proposals (RFP), financing options, installation and commissioning, and post-installation procedures to analyze system performance. These discussions contributed to a better understanding of the challenges and opportunities associated with onsite energy deployment, providing a foundation for informed decision-making and action within partners and other organizations. The Onsite Renewable Energy and Storage working group covered the following topics during the seven working group sessions:

1. Introduction to Onsite Energy

The first working group session explained the importance of onsite energy technologies and their contributions to decarbonization and scope 1 and 2 emission reductions, the barriers industrial facilities face to using clean energy technologies, and the factors driving interest and comfort levels with onsite energy technologies

2. Technology Options, Suitability and Screenings

DOE technical experts explained battery storage, emerging long duration energy storage, and thermal energy storage and provided an overview of site suitability considerations and barriers to deployment. This session also addressed the screening process for onsite energy technologies and the tools that can be used to identify the economic value and emissions impact at a site.

3. Cost and Financing

This session discussed the costs of onsite energy technologies and available incentives, and provided an overview of project financing options, including common third-party ownership mechanisms, emerging options for third-party ownership, and changes to tax equity incentives resulting from the Inflation Reduction Act (IRA).

4. Engaging with Utilities

The fourth session explained utility interconnection strategies, customer/developer roles and responsibilities, and design & engineering considerations. DOE technical experts also discussed the differences between regulated and deregulated electricity markets and explained energy charges, demand charges, and fixed charges.

5. Peer-to-Peer Case Studies

This session included four peer-to-peer case study presentations from working group participants, discussing various steps of the onsite energy implementation process. More details can be found in the “Partner Highlights” section below.

6. Portfolio Analysis and Performance Assessments

The sixth session featured one peer-to-peer case study presentation focused on portfolio screening for onsite solar developments. Working group participants were also introduced to the Federal Energy Management Program’s (FEMP) Performance Assessment Method for solar PV and battery energy storage systems to determine actual versus expected performance.

7. Wrap-up, Feedback, and Deliverables

The final working group session provided an overview of the ten planning primers focused on key barriers to the implementation of onsite energy projects. More details can be found in the “Working Group Outcomes” section below.

Partner Highlights

The active participation and support from partner organizations was instrumental in advancing the goals of the Onsite Renewable Energy and Storage working group. All working group members contributed to informal discussions, and the following organizations presented their experiences with onsite energy technologies and the implementation thereof:

- ▶ **W.L. Gore & Associates:** W.L Gore & Associates, a materials manufacturing company, operates 3 MW of PV capacity at their Phoenix, AZ manufacturing campus. One significant lesson learned from the project was to manage expectations around cost savings resulting from the installation and carefully and regularly check utility bills for any taxes, fees, and other costs that can lower expected bill savings from the PV project
- ▶ **Stryker:** Stryker, a medical device and equipment manufacturing company, developed an onsite renewable energy toolkit to guide their process from initial inquiry to successful project implementation. The toolkit includes a responsibility assignment matrix and a list of key questions to answer regarding evaluating technical feasibility and economic viability, managing risks, and determining the right financing mechanism.
- ▶ **Ford Motor Company:** Ford Motor Company, an automobile manufacturer, operates a 4 MW / 8 MWh battery energy storage system (BESS) at the Essex Engine Plant in Ontario, Canada. One lesson learned from the project was to be conservative when forecasting grid savings and demand charge assumptions of the project to account for unforeseen situations.

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- ▶ **Colgate-Palmolive Company:** Colgate-Palmolive Company, a consumer products manufacturing company, operates a 760-kW solar photovoltaic system at its Oral Care, Flavors Manufacturing Facility in Burlington, NJ and a solar thermal system at the Home Care Manufacturing Facility in Athens, Greece. One key takeaway was to keep comprehensive records of system specifications to ensure effective training of new staff and proper upkeep of O&M procedures.
- ▶ **Solaris Energy Inc.:** Solaris Energy, a solar financier and developer, conducted solar feasibility screenings in three locations (Indiana, central California, and southern California) for a large industrial manufacturing company. One main lesson learned from these screening processes was to allow abundant time for the portfolio analysis and development of the most viable onsite energy solutions.

Working Group Outcomes

The working group outcomes include a set of planning primers focused on the stages of implementing onsite energy projects. All topic areas were identified as needs by commercial and industrial working group participants and developed collaboratively across working group teams. These ten primers aim to be actionable, usable guidance documents to support the high-quality decision-making for onsite energy deployment. The primer documents can be accessed on the Better Buildings Solution Center website: <https://betterbuildingssolutioncenter.energy.gov/climate-challenge/working-groups>.

- ▶ [Portfolio Screening and Prioritization for Onsite Energy](#)
- ▶ [Site-Level Screening and Technology Selection](#)
- ▶ [Assembling an Effective Team for Renewable Generation and Storage Projects](#)
- ▶ Financing and Incentives (coming soon)
- ▶ Utility Considerations (coming soon)
- ▶ Ownership Options (coming soon)
- ▶ Working with Third-Party Design and Engineering Firms (coming soon)
- ▶ Deployment Strategies (Integration Pathways) (coming soon)
- ▶ “After the Installation” Considerations (coming soon)
- ▶ Onsite Case Study Collection (coming soon)

Summary

The Onsite Renewable Energy and Storage working group successfully informed participants about onsite energy implementation and addressed key aspects of the screening, financing, installation, and post-installation processes. Based on feedback from working group participants, the commercial and industrial Onsite Renewable Energy and Storage Working Groups developed a set of primer documents to further assist with onsite energy deployment. The support and involvement of partners has been essential in advancing the collective understanding of onsite energy deployment.