

The Better Climate Challenge Portfolio-level Greenhouse Gas Emissions Reduction Planning Working Group (ERP Working Group) convened more than 25 industrial partners to develop an actionable plan for GHG emissions reductions for a portfolio of industrial facilities. Partners, along with DOE technical experts shared experiences, barriers, and best practices as part of the Emissions Reduction Planning process. The ERP Working Group documented enablers and barriers, and identified technical trainings, resources, tools, and research needs to help organizations develop a successful ERP.

## Outcomes

The ERP Working Group developed a Framework for Greenhouse Gas Emissions Reduction Planning: Industrial Portfolios. Heavily informed by partner input, this framework will help organizations develop an actionable plan to achieve Scope 1 and 2 GHG emissions reduction goals.

## Discussion Topics

Throughout seven ERP Working Group meetings, Better Climate Challenge partners provided input on this framework based on their expertise in developing and implementing emissions reduction plans in their own organizations. Five major milestones were identified to help develop an ERP. The milestones are laid out as follows:

### ► Milestone 1: Establish Inventory & Scope of Work

The purpose of this milestone is to understand the sources of an organization's GHG emissions and to define the scope of work for the emissions reduction planning process itself. It includes developing a GHG emissions inventory, management plan, GHG reduction target, and defining evaluation criteria.

### ► Milestone 2: Categorize Portfolio

Through this milestone organizations will identify and categorize facilities within a portfolio, primarily to identify those with the highest potential to reduce GHG emissions. This allows an organization to direct its focus and identify key metrics that they can use to benchmark performance.

### ► Milestone 3: Assess Measures

Upon completing this milestone, an organization moves forward with both facility-level and portfolio-level emissions reduction assessments. This two-fold approach provides broad coverage of the different emissions reduction measures (ERMs) organizations may use to achieve their emissions reduction goals.

### ► Milestone 4: Develop Scenarios

After identifying and assessing ERMs, an organization can now combine, scale, and phase ERMs across the portfolio to create emissions reduction scenarios. By developing and analyzing multiple scenarios, organizations can compare the costs and benefits and select a pathway that helps them reach their goal most effectively.

## KEY TAKEAWAYS

An Emissions Reduction Plan will enable organizations to:

- Understand and characterize their emissions sources.
- Explore emission mitigation activities and identify barriers faced by organizations.
- Define a workable, phased plan of mitigation activities.
- Create a strategy for implementation of the plan and assess progress towards achieving their goal.
- Communicate the strategy internally and externally.

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### ► Milestone 5: Define Emissions Reduction Plan

In this final milestone, organizations create the ERP and define how the organization's emissions targets will be met, the time when ERMs will be executed, assign responsibility to key stakeholders, outline financing plans, and communicate the next steps.

The implementation of an ERP helps organizations to develop and execute a work plan and measure and track progress on GHG reductions. An ERP must be periodically reassessed and revised to ensure it is in line with the organization's emissions reduction goals.

### Lessons Learned

During the facilitated discussions, several industry trends and best practices were identified. Some key learnings: Successful organizations have executive sponsors in the C-suite and a dedicated steering committee for sustainability efforts. The committee engages with diverse internal and external stakeholders through meetings, brainstorming sessions, and workshops to leverage inputs from managers, plant engineers, and other internal stakeholders to develop a holistic emissions reduction roadmap. Major decarbonization pathways have dedicated leadership to gather input from many divisions and geographies to make informed decisions and leverage new cutting-edge technologies.

- Successful organizations have a robust GHG emissions inventory that is third-party verified. While most participants are collecting data at a facility level, many are working towards submetering their electricity and natural gas use by process/systems to get access to more granular data. In the absence of granular data, they rely on internally developed playbooks, ISO 50001, and SEP methodology to identify significant energy users.
- Successful organizations are pursuing a diverse portfolio of renewable energy options, including procurement strategies such as physical power purchase agreements (PPPAs), virtual power purchase agreements (VPPAs), unbundled renewable energy certificates (RECs), and utility tariff programs. VPPAs and unbundled RECs were described by many participants as a "bridge" option, with onsite renewable energy with storage capacity considered by many to be preferred. However, space limitation is a barrier for onsite technology. The participants also indicated that power purchase agreements are complex and can have long lead times. While experience clarifies the process, it does not necessarily shorten the time required to finalize a contract. Due to these complexities related to renewable energy purchase, participants recommend having internal staff members, who are experienced and knowledgeable in this field, work with external consultants.
- Most participants are considering electrification technologies, especially when replacing old equipment at end-of-life and are paring them with renewable energy to fully decarbonize fuel-fired systems. Many are also exploring low-carbon fuels to replace traditional fossil fuels in various applications including boilers, combined heat and power (CHP) systems, product testing, forklift operations, and others. A few participants are in the early stages of exploring carbon capture, utilization, and sequestration (CCUS) technologies with possible applications including post-combustion CCUS for boilers and thermal oxidizers. In some cases, high costs remain a barrier for certain electrification, fuel switching, and CCS technologies, meaning these are sometimes seen as longer-term ERMs. All participants highlighted that they are prioritizing energy efficiency projects in the near term.

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- ▶ Participants with near-term goals are prioritizing ERMs with high GHG emissions reduction impacts that can help reach their emissions reduction goal, at times even when the cost of investment is high. Participants with long-term goals are prioritizing projects based on emissions reduction potential, not solely on financial metrics such as simple return on investment (ROI). In some cases, participants use a Marginal Abatement Cost Curve (MACC) to assess the feasibility and impact of decarbonization projects. Some participants utilize an internal cost of carbon in their ROI and payback estimates to more effectively prioritize high-impact, high-cost ERMs.

### **Follow-up Activities**

The Framework for Greenhouse Gas Emissions Reduction Planning: Industrial Portfolios is now published and available online. DOE is in the process of developing a supporting toolkit to assist partners that are creating and implementing their own ERP. It will include tools, resources, templates, and more that will enable partners to step through the process of creating an ERP. DOE will showcase partners who have developed an ERP to highlight effective pathways to emissions reduction.