



Energy efficiency

Best practices

in partnership with WSP

Welcome to energy efficiency best practices training.
This introduction will prepare you for the following six training modules:



Before we start our training, please find the keys below to our interactive PDF:

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A call to action

The scientific consensus is clear. The world confronts an urgent carbon problem. Carbon dioxide, and other greenhouse gases, in our atmosphere have created a blanket of gas that traps heat and is changing the world's climate. Already, the planet's temperature has risen by 1 degree Celsius. If we don't curb emissions and temperatures continue to climb, science tells us that the results will be catastrophic.

As the scientific community has concluded, human activity has released more than 2 trillion metric tons of greenhouse gases into the Earth's atmosphere since the start of the First Industrial Revolution in the mid-1700s. Over three-quarters of this is carbon dioxide, with most of this carbon emitted since the mid-1950s. This is more carbon than nature can re-absorb, and every year humanity pumps more than 50 billion metric tons of additional greenhouse gases into the air. This isn't a fleeting problem that lasts just a few years or even a decade. Once excess carbon enters the atmosphere it can take thousands of years to dissipate.

The world's climate experts agree that the world must take urgent action to reduce emissions to near zero. By 2050, the world will need to meet net-zero emissions to avoid the worst impacts of climate change. This means humanity must remove as much carbon as it emits. This will take aggressive approaches, new technology that doesn't exist today, and innovative public policy. It is an ambitious—even audacious—goal, but science tells us that it's a goal of fundamental importance to every person alive today and for every generation to follow.



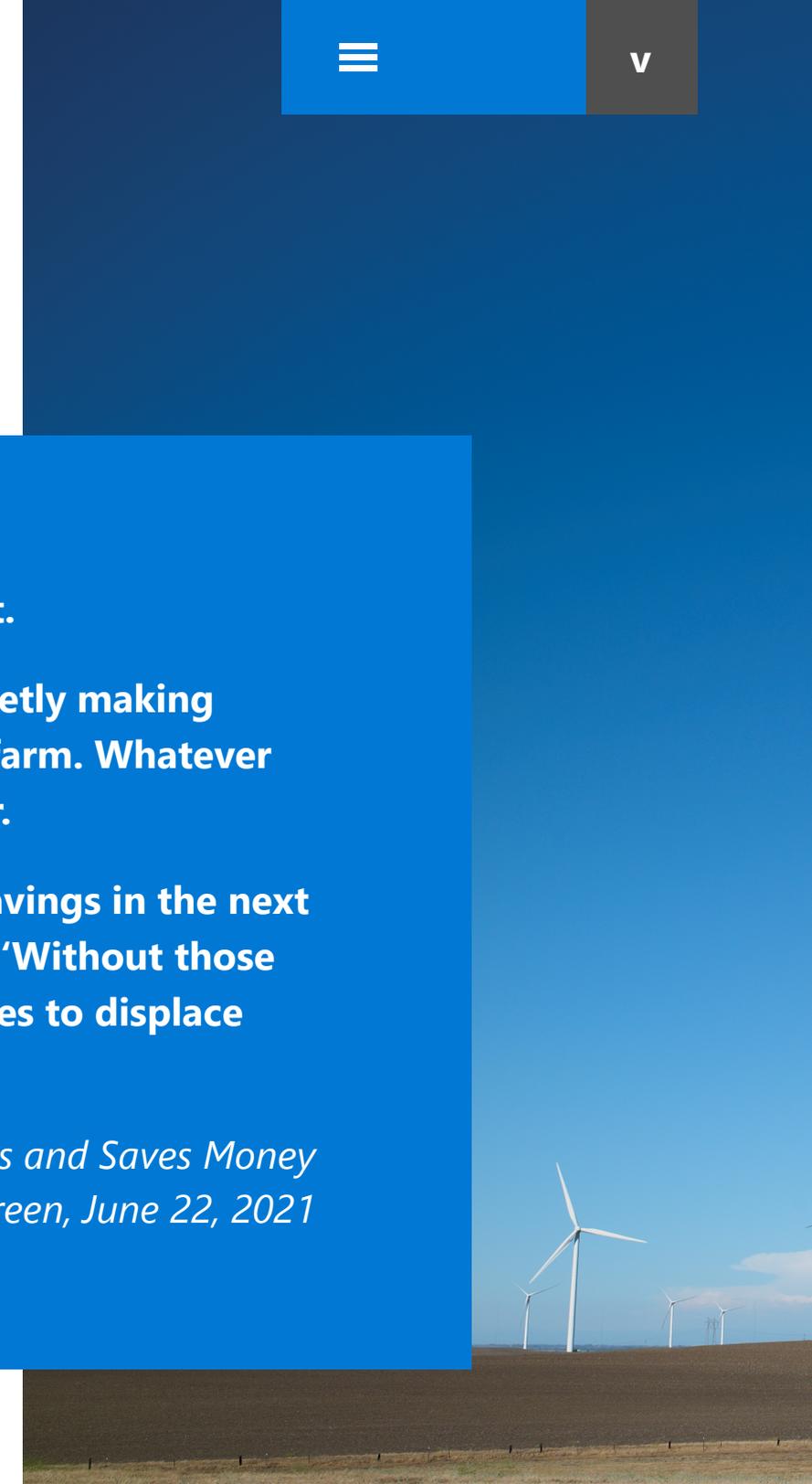
The importance of energy efficiency

“There’s a way to cut emissions and save money, but not enough people talk about it.

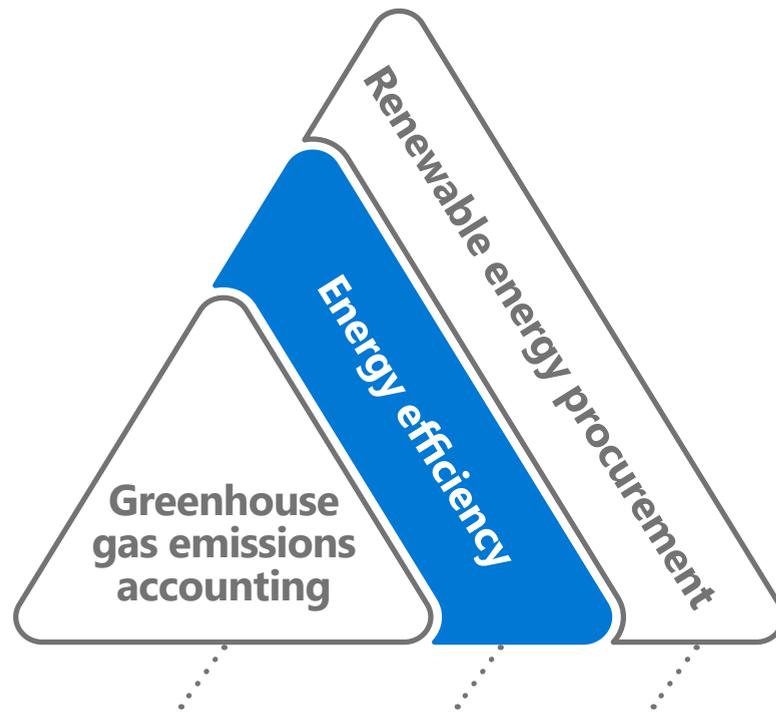
Perhaps it’s because the phrase ‘energy efficiency’ induces some to yawn. Or that quietly making something more efficient isn’t as politically rewarding as building a new shiny solar farm. Whatever the reason, it’s clear that the world isn’t investing enough in this critical climate lever.

Energy efficiency, along with wind and solar power, will provide half the emissions savings in the next decade in the International Energy Agency’s roadmap for reaching net zero by 2050. ‘Without those efficiency gains, electricity demand growth would make it much harder for renewables to displace fossil fuels in electricity generation,’ the IEA concluded.”

*—The Climate Solution that Cuts Emissions and Saves Money
Akshat Rathi, Bloomberg Green, June 22, 2021*



This training is the second part of a capacity-building series and is focused on reducing energy-related greenhouse gas emissions (GHG).



1. Assess greenhouse gas emissions
2. **Optimize energy use**
3. Shift to low- or no-emission energy

Capacity-building objective

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Learning objectives

As you learned in [Emissions Reduction 101](#), energy efficiency is a critical lever for reducing the GHG emissions contributing to climate change. Increasing efficiency and reducing energy use can also reduce operating costs.

The next six modules will be a deeper dive into how you can develop and implement energy efficiency strategies at your company. These materials are designed to be accessible to anyone, without an advanced sustainability or energy management background. They are intended to help corporate environmental, social, and governance (ESG) planning or sustainability, facilities, finance, or executive audiences understand the basic process to design and implement an energy reduction strategy.

At the end of these six modules, you should be able to:

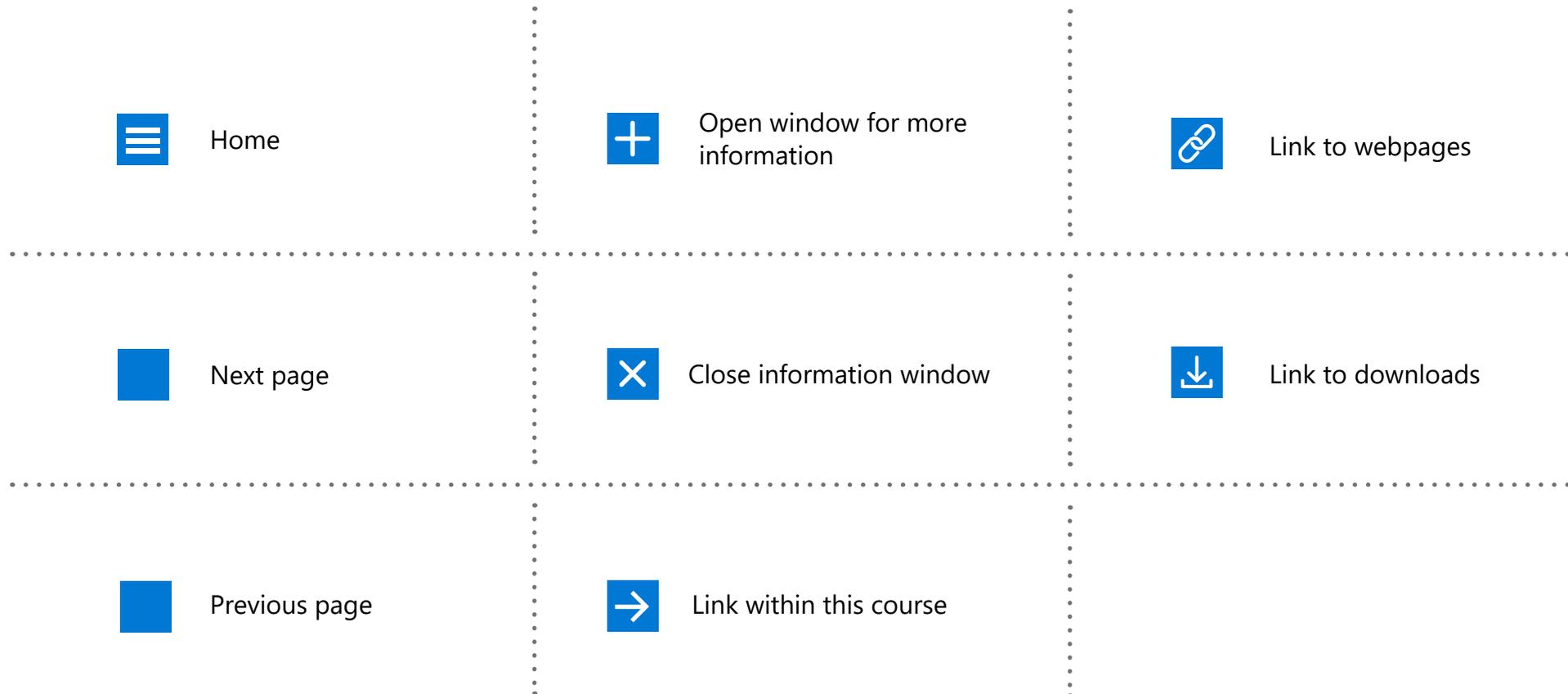
- **Understand how to start an energy management program.**
- **Engage stakeholders.**
- **Identify energy efficiency opportunities.**
- **Build an implementation roadmap.**
- **Develop a business case.**
- **Implement energy efficiency projects.**



Module 1

Getting started with energy management

Before we start our training, please find the keys below to our interactive PDF:



Learning objectives

This is the first of six energy efficiency modules and reviews the preliminary steps to stand up an effective energy management program. Once you complete this module you should:

- Understand the preliminary steps to take to stand up an energy management program.
- Recognize how to use benchmarking activities to inform an energy efficiency program framework and SMART goals.
- Know how to access industry resources to support program building and continued energy efficiency education.

This module is followed by **Module 2 – Stakeholder engagement** which will cover methods for engaging effectively with energy efficiency program stakeholders to build and manage your program.

Once you complete this module, you'll have the following modules left:



Terms to know

AEE: Association of Energy Engineers.

ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Baseline: The initial energy use measured with the current operating parameters that future energy use, after ECM implementation, can be measured against.

DOE: U.S. Department of Energy.

ECM: Energy conservation measure.

Energy efficiency: Reducing the amount of energy needed to provide the same or improved level of service to the consumer.

ENERGY STAR: A program run by the U.S. Environmental Protection Agency and U.S. Department of Energy that promotes energy efficiency.

GSA: U.S. General Services Administration.

IPCC: International Panel on Climate Change.

ISO: International Organization for Standardization.

NREL: National Renewable Energy Laboratory.

SMART Goals: Framework for guiding goal setting, with goal criteria as Specific, Measurable, Achievable, Relevant, and Time-Based.



The importance of energy efficiency

Energy efficiency reduces the amount of energy needed to provide the same or improved level of service to the consumer. In short, it means **using less energy to get the same (or a better) job done.**

Increasing energy efficiency of the built environment is one of the primary tenets of the IPCC's pathways to carbon reduction.

Buildings generate nearly 40 percent of annual global GHG emissions



On average, 30 percent of the energy used in commercial buildings is wasted



Energy efficiency

...opportunities are **often more cost effective** than other carbon reduction approaches.

...**projects support the transition to renewable energy** by reducing capacity development needs.

...projects frequently **provide benefits beyond carbon reduction**, such as:

Common energy conservation measures

As a first step, establish an energy performance baseline and benchmark your performance to inform your energy efficiency program vision, goals, and roadmap. Common ECMs include, but are not limited to:



Key resource: GSA's [Sustainable Facilities Tool](#) is an interactive resource that allows users to click through various building systems and workspaces in a virtual facility to explore common ECMs and energy management principles.

Benchmark your energy efficiency program

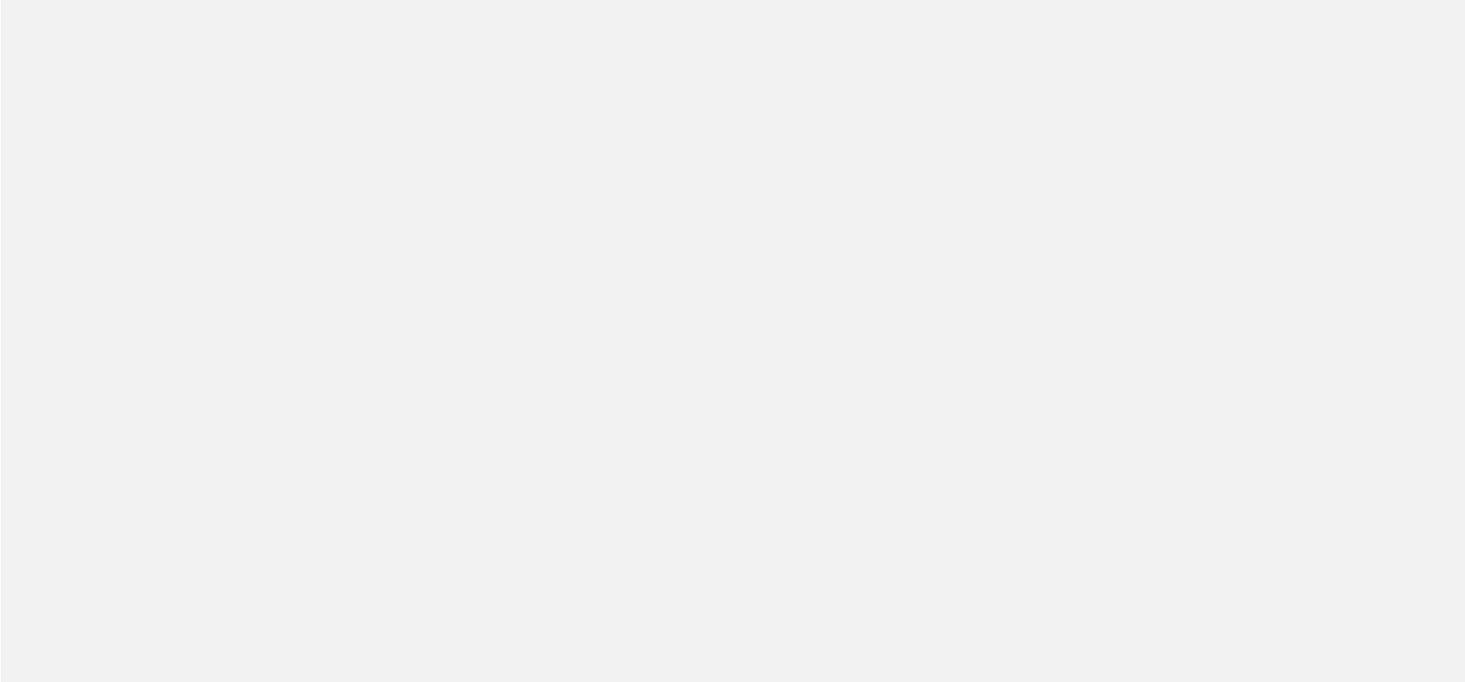
As a first step, assess the status of your energy efficiency program to inform the program vision, goals, and roadmap. “You can’t manage what you don’t measure.”

What is benchmarking? Comparing the performance of a process, facility, or organization to itself, its peers, or established norms, with the goal of informing and motivating performance improvement.¹

Benchmark your program against competitors in at least the following areas:

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1 - In the energy industry, the term benchmarking is often used to refer specifically to quantitative building performance benchmarking in the energy industry. This slide refers to program-level benchmarking, including quantitative and qualitative components.

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Sample benchmarking resources

- [ENERGY STAR Portfolio Manager](#)
- [Commercial Building Energy Consumption Survey \(CBECS\)](#)
- [DOE Better Buildings Initiative](#)
- [Carbon Disclosure Project \(CDP\) published responses](#)
- [Global Real Estate Sustainability Board \(GRESB\)](#)
- Corporate sustainability reports
- Company websites and publications
- Commercial (third party) benchmarking platforms

Outline a program framework

Use the results of benchmarking to **establish a preliminary framework or “vision” for your energy efficiency program**. Expect program design and development to be an iterative process that incorporates feedback from stakeholders—this is intended to be a starting point for engagement.

Creating SMART energy efficiency goals

With a preliminary program framework drafted, leading companies establish SMART energy efficiency goals to drive action and track progress. Similar to program framework development, revise and refine goals through stakeholder engagement.

Portfolio-level example:

Reduce **owned building portfolio energy intensity (kWh/SF)** by **10%** by FY25 compared to an FY20 baseline.

Building-level example:

Reduce **HQ building energy costs** by **\$100,000 annually** in FY22 compared to an FY15 baseline.

Initiative-level example:

Upgrade all interior lighting to LEDs across **20 owned-and-operated sites in the Southeast US region** by FY22 to reduce **regional annual lighting use** by **2,500,000 kWh** compared to FY21.

Build on industry resources

There are a myriad of resources and tools available to support energy efficiency program development and management provided by federal agencies, industry organizations, commercial vendors, and non-profits. This page provides a sampling of available resources from industry-leading organizations for review and use.

Benchmarking

- [DOE Building Energy Use Benchmarking](#)
- [ENERGY STAR Portfolio Manager](#)
 - Commercial energy and resource benchmarking platforms (multiple available via web search)

Technical energy engineering

- [ASHRAE Standard 90.1: Energy Standard for Commercial Buildings Except Low-Rise Residential](#)
- [ISO 5001: Energy Management Systems Standard](#)
- [Whole Building Design Guide \(WBDG\)](#)
- [American Society of Energy Engineers \(AEE\) trainings and certifications](#)

Program development

- [National Renewable Energy Laboratory \(NREL\) Commercial Buildings guidance](#)
- [ENERGY STAR Guidelines for Energy Management](#)

Case studies

- [ENERGY STAR Partner of the Year Success Stories](#)
- [DOE Better Buildings Solution Center Energy Management Case Studies](#)

Congratulations! You've completed Module 1: Getting started with energy management

This module provided a high-level review of best practices for starting an energy efficiency program. Key takeaways:

- Energy efficiency is a key building block in global carbon reduction.
- Start by benchmarking your organization's energy efficiency performance, processes, and goals.
- Develop an overarching program framework tailored to your organization's needs and characteristics.
- Draft SMART goals.
- Review available industry resources to support program development and implementation.

This module is followed by [Module 2 – Stakeholder engagement](#) which provides an in-depth review of identifying stakeholders and engaging them in the process.

Module 1 Getting started with energy management	Module 2 Stakeholder engagement	Module 3 Opportunity identification	Module 4 Roadmap development	Module 5 Business case development	Module 6 Energy efficiency in action
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