



Section: Continual Improvement

Task 18: We consider energy performance opportunities when designing new, modified, or renovated facilities, equipment, systems and processes

Getting It Done

- Use the [Energy Considerations in Design Worksheet](#) to identify and evaluate energy performance improvement opportunities and operational controls in design activities.

Task Overview

In ISO 50001, the design requirements are not associated with the design of products or services; they are applicable to the development of new, modified, and renovated facilities, equipment, systems, and processes that can have a major impact on energy performance. *Energy performance* is defined as measurable results related to energy efficiency, energy use, and energy consumption. The design requirements of ISO 50001 incorporate energy performance improvement opportunities and operational control as considerations in design activities. This can provide the basis for more innovative and energy-efficient designs.

At the completion of this task, you will have...

- Identified the facilities, equipment, systems, and processes that can have significant impact on energy performance
- Incorporated consideration of energy opportunities and operational control in design projects
- Included results of energy performance evaluation in specification, design, and procurement
- Recorded results of design activities

This guidance is relevant to Section 4.5.6 of the ISO 50001:2011 standard.

Associated Resources	Short Description
Energy Considerations in Design Worksheet	A template for use when reviewing and considering design energy inputs.
Example Misapplications of Energy-Efficient Technologies	This resource gives users a practical example of how energy efficient technologies may be used incorrectly in motor and AC applications.
ENERGY STAR Guidelines for Energy Management	ENERGY STAR Guidelines for Energy Management guidance document.



Full Description

Identify the facilities, equipment, systems, and processes that can have significant impact on energy performance

Any facilities, equipment, systems, or processes that are within the scope of the EnMS that can or will significantly impact energy performance fall under the design requirements of ISO 50001. This means that energy performance improvement opportunities and operational controls must be considered when you design new, renovate, or modify any facilities, equipment, systems, and processes that can have a major effect on your energy efficiency, energy use, and energy consumption.

The facilities, equipment, systems, and processes that can affect energy performance can vary, depending on project specifics. At a minimum, items that can significantly affect energy performance include facilities, equipment, systems, or processes associated with:

- Management and operation of significant energy uses
- Achievement of energy objectives, targets and action plans
- EnPIs

Incorporate consideration of energy opportunities and operational control in design projects

When designing new facilities, equipment, systems, and processes, or renovating or modifying existing ones, think about how they can or will affect your organization's energy performance. Identify potential energy performance improvements that can be considered for the design. Also, identify any operational controls that may be needed. These would include controls necessary to achieve the energy performance improvement, or at least to minimize (or appropriately manage) the impacts of the design on your organization's energy performance.

Examples of design for energy performance improvement include the following:

- Design lighting to automatically adjust according to the amount of daylight present. (Equipment)
- Design air conditioning systems to use a water-cooled central chiller instead of an air-cooled split system for cooling. (System)
- Design the molding process such that hydraulic pumps only pump the volume needed instead of operating at full speed and pumping full volume. (Processes)

Some questions to ask when designing new, modified, or renovated facilities, equipment, systems, and processes include:

- What characteristics of this item impact energy consumption (past, current, or future)?



- Where and how can energy consumption be reduced?

When evaluating the opportunities for improving energy performance, consider the following:

- How will the existing facilities, equipment, systems, and processes be modified?
- What specific items can be changed to improve energy efficiency and reduce energy consumption over time?
- What is the right energy source?
- What are the technological options?
- What operational controls are needed to achieve and sustain design intended energy performance?

For energy-efficient designs to achieve their full potential, the design process should be coupled with proper operational control. Since equipment controls can be bypassed or disabled, an operational control strategy must be combined with efficient design to make sure that anticipated savings are achieved.

The [Energy Considerations in Design Worksheet](#) can be useful in identifying and evaluating energy performance improvement opportunities and operational controls in design activities.

Include the results of the energy performance evaluation in specification, design, and procurement

Once the questions above have been answered, take action to improve energy performance. The results of the energy performance evaluation must be incorporated, where appropriate, into the specification, design, and procurement activities related to the project. This should ensure that the decisions on energy efficiency related to the design are carried out. Incorporating results into procurement specifications and activities keeps the purchasing function in the loop, ensures their awareness of procurement requirements to support the energy performance improvement, and provides the justification for any additional costs.

When designing or upgrading facilities, equipment, systems, or processes that can significantly impact energy performance, pay close attention to how new energy-efficient technology is specified, applied, and used in order to avoid misapplications. Installation of “energy-efficient” equipment does not ensure improved efficiency if the retrofit is not properly specified. Moreover, no energy-efficient technology will capture savings when installed or programmed incorrectly. (See [Example Misapplications of Energy-Efficient Technologies](#))

Record results of design activities

Maintain a record of the results of design activities to show energy considerations were properly addressed in the process. This can take a variety of forms, such as a completed checklist, meeting



minutes, design drawings, purchasing specifications, project records, and more.