Section: Planning

Task 9: We determine our significant energy uses (SEUs), identify and monitor their relevant variables and energy performance, and identify the persons that affect the SEUs. We have a process to review and update SEU data and related information, including our methods and criteria to determine that an energy use should be an SEU.

Getting It Done

1. Identify the energy uses that consume the most energy within your boundaries.
2. Identify factors and persons that affect the energy consumption of identified energy uses.
3. Establish a selection criteria for identifying which of these energy uses should be a significant energy use (SEU).
4. Determine SEU energy performance based upon energy consumption and relevant variables is appropriate.
5. Review the SEU selection criteria as part of the SEU update process.

Task Overview

Significant energy uses (SEUs) are energy uses identified by the organization as having major energy consumption and/or considerable opportunity for improvement. They are a key component of the 50001 Ready system and require additional attention and action relative to other energy uses. It's important to identify your organization's SEUs using defined criteria for significance. When starting out with a 50001 Ready system, it is recommended to tackle just one or two SEUs.

Once identified, the current energy performance of SEUs needs to be determined. The performance of the SEU is dependent on factors that influence its operation. Identifying these factors or relevant variables will help you to determine their current energy performance. Once the performance is determined, processes should be implemented to continually monitor that performance. Collecting, analyzing, and tracking data on SEU performance can reveal opportunities for improvement.

In addition to determining and then monitoring SEU energy performance, it is important to identify the people that influence or affect the operation of SEUs. In most cases, the energy performance of SEUs is affected by persons who perform ongoing operational control and maintenance activities. However, there may be other personnel who also influence or affect the SEUs; for example, site managers or engineers. Once these people are identified it will be important to engage with them so they are aware of the focus on the SEU and any upcoming capital or operational improvements to be made.

Lastly, it is important to plan for how and when the energy team will review and update the criteria and process of selecting SEUs and consider if current and potential SEUs meet selection criteria. Over time,

Licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

the energy uses identified as significant may change as your organization continues to improve its energy performance. Also over time, it may be appropriate to modify the evaluation and selection methodology based on changes in sites, equipment, systems, or processes.

This guidance is relevant to sections 6.3 b) and c) of the ISO 50001:2018 standard.

Associated Resources Short Description

no resources for this questions

Full Description

Determine and apply criteria for selecting SEUs

By definition in ISO 50001, significant energy uses (SEUs) are energy uses with substantial energy consumption and/or considerable potential for energy performance improvement. Criteria for the selection of SEUs should include both of these determining concepts. Your organization decides as part of this criteria what is considered to be “substantial” consumption and what is considered to be “considerable potential” for energy performance improvement.

Most organizations will determine SEUs based on the largest energy consuming systems and equipment identified in an energy balance. However, SEUs also may be determined based on considerable potential for energy performance improvement (see Task 10 Improvement Opportunities). This can be a good option if your organization has been engaged in energy management activities for many years and the opportunities for additional improvements to the largest energy-consuming systems are limited, or if organizational hurdles exist to meaningfully change the largest energy-consuming systems. In this situation, you can focus on smaller systems that have greater opportunity for energy performance improvement.

In Task 8 Energy Data Collection and Analysis, the energy balance was presented as a method of reasonable assurance that you have accounted for all the energy consumed in your organization. Once a balance is achieved, one of the most common methods for determining SEUs is to rank the energy uses by consumption. You can then establish a certain threshold of energy consumption or a certain percentage of total consumption as the selection criterion for significance (see Task 8 Energy Data Collection and Analysis). The top energy consuming uses can then be evaluated for improvement opportunities, if they haven’t been already (see Task 10 Improvement Opportunities). However, this is only an example of one way to approach the selection criteria; you can choose different approaches that are appropriate for your organization.

Learn More: **80/20 Rule**

In industry and many businesses, the *80/20 rule* typically applies (see Task 8 Energy Data Collection and Analysis); i.e., 80 percent of the energy consumption will be accounted for by 20 percent of the equipment or processes. Typically, only a few energy systems consume the majority of a site’s

(cc) BY-SA Licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

energy. Consider focusing on these, and apply the criteria for significance. Energy management is a continual improvement process, and over time additional energy uses can be identified as significant.

For newly implemented energy management systems, it is important to start simply. Consider limiting the number of SEUs in your new EnMS, since these energy uses can require the most resources. ISO 50001 requires that you address operational and maintenance controls (see Task 17 Operational Controls), procurement (see Task 19 Energy Considerations in Procurement), and monitoring and measurement (see Task 21 Monitoring and Measurement of Energy Performance Improvement) of all the SEUs identified. You will also need to consider SEUs when establishing objectives and energy targets (see Task 12 Objectives and Targets) and Task 10 Improvement Opportunities). These requirements can quickly consume available resources.

Determine relevant variables and current energy performance of SEUs and implement monitoring

Once SEUs are identified, collect appropriate energy data to determine their performance (part of Task 8 Energy Data Collection and Analysis). Factors that can affect SEU energy performance are called relevant variables (for details on relevant variables see Task 8Energy Data Collection and Analysis).

For commercial or institutional facilities, occupancy and weather can often be variables affecting consumption. For industrial facilities, production is generally an additional variable that affects energy consumption of SEUs. Using engineering logic, think about the potential SEU and what may be relevant variables. In addition to weather, occupancy, and production, consider the following: operating schedule, product mix, input materials, and season.

Verify the impact of specific variables on SEUs by collecting relevant energy data and comparing it to appropriate variable data to determine the relationship, if any, of the change in energy consumption coinciding with the change in the variable. One way to define the relationship is to graph the energy data over a defined time period and compare it to a graph of the variable data, such as average daily temperature, over the same period and determine if there are coincidental variations. Consistent variations between the two could indicate a valid relevant variable. Anomalies between the two may indicate other relevant variables are also a factor in energy consumption of the SEU. Statistical techniques or more sophisticated engineering calculations may be required for analysis of multiple variables.

Energy performance indicators (EnPIs) (see Task 11 Energy Performance Indicators and Energy Baselines) can be developed to define the energy performance for a SEU. For many common energy systems that are often identified as SEUs there are standardized EnPIs used by energy professionals. Similar EnPIs can be developed for sites, equipment, processes, personnel, or other systems. Consider normalizing the EnPIs for the SEUs using relevant variable data; this may lead to more meaningful results. Normalized EnPIs and related baselines allow performance comparisons under equivalent conditions.

Track EnPI values to reveal trends that allow comparison of the performance of SEUs over time.

(cc) BY-SA Licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Benchmarking, which is the practice of comparing an SEU to the best in class or theoretically optimal performance of similar uses, may be used when available (see Task 8 Energy Data Collection and Analysis).

Energy performance of an SEU also can be determined and monitored by operational or maintenance parameters (see Task 21 Monitoring and Measurement of Energy Performance Improvement).

Operations of SEUs are among the "key characteristics" affecting energy performance that are regularly monitored, measured, and analyzed (see Task 21 Monitoring and Measurement of Energy Performance Improvement). Your organization decides on the method for determining the energy performance, identifies the monitoring and measurement necessary for data collection, and includes it in the Energy Data Collection Plan (see Task 8 Energy Data Collection and Analysis).

Data analysis is a continuous process. Continue to monitor SEUs and collect, analyze, and track the data. This can have the added potential benefit of identifying opportunities for energy performance improvement of the SEUs.

Identify persons who affect the SEUs

Identify the employees, onsite contractors, and service providers whose work activities affect SEUs. These personnel may need additional awareness training or specific qualifications to ensure that the operations associated with the SEU are followed correctly and, if applicable, that energy performance targets are achieved. This is particularly true for personnel responsible for the operation or maintenance of sites, equipment, systems, or processes identified as SEUs. The optional Playbook worksheet can be useful in helping to identify the potential types of personnel who may be relevant to an SEU.

Plan for updating SEU selection

The process of identifying SEUs is part of the energy review. Documented information must be maintained on the criteria and process used to select SEUs. Documented information should be updated as the selection criteria and process of identifying SEUs changes. The optional Playbook worksheet can help document the criteria and method used to determine significant energy uses.

Plan for how the energy team will regularly review and update which energy uses are selected as SEUs, as well as the selection criteria and process methodology. Management input should be solicited during this process. Changes in the selected SEUs or the evaluation and selection process may be necessary for a number of reasons:

- Improvement projects have reduced consumption of an SEU below the selection threshold.
- Resources available to address SEUs have changed.
- Business changes have affected SEU focus/selection.
- New processes have altered energy consumption patterns.
- Major changes in sites, equipment, systems and energy-using processes have occurred.

Documenting SEU information

(cc) BY-SA Licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Documenting SEU information is a recommended best practice. Record the significant energy uses, the areas or operations with which they are associated, and the affected personnel (by position title). A simple spreadsheet can serve as the list of current SEUs and a place to record other information that will be needed to ensure proper management of significant energy uses.

Decarbonization

Significant energy uses (SEUs) are energy uses identified by the organization as having substantial energy consumption and/or considerable potential for improvement. They are a key component of the 50001 Ready system and require additional attention and action relative to other energy uses. It's important to identify your organization's SEUs using defined criteria for significance.

When including energy-related GHG emissions in your EnMS, your organization should include the potential for improving energy and energy-related GHG emissions performance as determining concepts for the selection of SEUs. Criteria for selecting SEUs will help your organization integrate GHG emissions into the management of SEUs could include:

- Identifying factors and persons that affect the energy-related GHG emissions of SEUs
- Determining SEU energy-related GHG emissions performance based upon energy consumption and relevant variables
- Monitoring and measuring SEU energy performance improvement

Establishing a new EnMS prioritizing decarbonization

If you do not have an existing 50001 Ready-based EnMS and want to build one that also helps your organization manage energy-related GHG emissions, you should follow the guidance in the "Full Description" tab keeping the following in mind:

1. **Determine and apply criteria for selecting SEUs**. Make sure to include criteria for determining SEUs energy-related GHG emissions and/or energy-related GHG emission reduction opportunities (or any other GHG-related approach that is appropriate to your organization).
2. **Determine relevant variables and performance of SEUs and implement a monitoring process.** When including GHG emissions as criteria for selecting SEUs, consider the relevant variables that can affect energy-related GHG performance and the data that will need to be collected to determine the energy-related GHG emissions performance of the SEU. Refer to Task 8 Energy Data Collection and Analysis for an overview of data collection processes and determining relevant variables. Make sure you build upon the energy data that is already being collected and your existing list of relevant variables. If the potential for improving energy-related GHG emission performance is included as criteria, refer to Task 10 Improvement Opportunities for an overview of the processes for identifying GHG performance improvement opportunities. Include GHG-related measurements in the monitoring of SEUs. Follow the process detailed in Task 21 Monitoring and Measurement of Energy Performance Improvement.
3. **Identify persons who affect the SEUs**. Identify the person(s) who affect SEUs and ensure that they have the appropriate training or qualifications to manage both energy and energy-related GHG emissions.

(cc) BY-SA Licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

4. **Plan for updating SEU selection**. Include energy-related GHG emissions in your process for reviewing and updating SEUs. Keep in mind that business changes can affect the relative importance of energy-related GHG emissions and therefore the criteria for selecting SEUs.
5. **Document your SEU information**. Include documentation on the relative importance of energy-related GHG emissions (performance and reduction opportunities) in your SEU information.

Adapting an existing EnMS to prioritize decarbonization

If you have an existing 50001 Ready-based EnMS and want to adapt it to manage GHG emissions, you should:

1. **Review your criteria for selecting SEUs**. Review your criteria for defining SEUs to establish how to integrate energy-related GHG emissions and/or energy-related GHG emission reduction potential or to determine if there is another GHG-related approach that is appropriate to your organization.
2. **Review relevant variables and performance of SEUs and review your monitoring process.** When adding energy-related GHG emissions as criteria for selecting SEUs, consider the relevant variables that can affect energy-related GHG performance and the data that will need to be collected to determine the energy-related GHG emissions performance of the SEU. Refer to Task 8 Energy Data Collection and Analysis for an overview of data collection processes and determining relevant variables. Make sure you build upon the energy data that is already being collected and your existing list of relevant variables. If the potential for improving energy-related GHG emission performance is added as criteria, refer to Task 10 Improvement Opportunities for an overview of the processes for identifying energy-related GHG performance improvement opportunities. Implement monitoring of SEUs, including GHG-related measurements. Follow the process detailed in Task 21 Monitoring and Measurement of Energy Performance Improvement.
3. **Review the list of persons who affect SEUs**. If SEUs have changed, identify the person(s) who affect SEUs and ensure that they have the appropriate training or qualifications to manage both energy and GHG emissions.
4. **Review your plan for updating SEU selection**. Review your plan for updating SEU selections to see if the inclusion of GHG emissions changes the plan.
5. **Document your SEU information**. If your criteria for selecting SEUs, the list of SEUs, or the affected personnel have changed, make sure to update the documented SEU information.

Commercial Emissions Reduction Planning Framework

The guidance for this task is from the following sections from the ERP Framework: ERP Framework Introduction and Milestone 1.

The process of identifying SEUs can involve gathering information on the characteristics of individual buildings within the portfolio and grouping them into categories for prioritization. Buildings within each category can then be benchmarked using tools like ENERGY STAR Portfolio Manager to identify opportunities for energy performance improvement.

Gather information on the selected characteristics of individual buildings to better understand what

(cc) BY-SA Licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

differentiates the buildings within the portfolio. Generally, three to five characteristics will be sufficient to categorize a portfolio. The organization may already have information available on some of these characteristics, but others may need to be collected internally or with the support of a consultant. Automated methods can be used to collect some of the characteristics, such as through virtual data-driven audits or automated building-stock analysis, to help speed the process. (Milestone 2)

Once characteristic information has been collected, group buildings in the portfolio into different categories for prioritization. This multi-layer approach to categorization helps owners define a subset of buildings that represents the breadth of their portfolio and captures the different emissions reduction strategies that may be applied. Within each category, buildings can be benchmarked using the ENERGY STAR Portfolio Manager (or a similar tool). Other analysis approaches can also provide a high-level identification of emissions reductions opportunities early in the process. (Milestone 2)

After calculating its GHG inventory and setting portfolio emissions reduction targets, an organization defines characteristics that differentiate its buildings (e.g., HVAC system type and GHG emissions intensity). These characteristics are used to categorize buildings in the portfolio. For example, buildings with packaged rooftop units are in one category, and buildings served by a central HVAC plant are in another category. Next, the organization selects a sample of buildings for decarbonization audits that represent the different categories. The framework refers to these as representative buildings. The results from these representative building audits are scaled across similar buildings to estimate emissions reduction impacts and develop potential scenarios at the portfolio level. Additionally, the scenarios are influenced by portfolio-level assessments such as fleet electrification studies, solar opportunity analysis, and utility green power options. After evaluating the scenarios, the organization selects and defines their emissions reduction pathway.

Industrial Emissions Reduction Planning Framework

Consider both direct (Scope 1) and indirect (Scope 2, such as electricity) emissions when identifying the organization's significant GHG emitters.

The guidance for Task 9 is found within the following section of the ERP Industrial Framework:

Milestone 2:

Identify and quantify GHG emissions for Significant Greenhouse Gas Emitters (SGEs) – Identify the largest GHG emissions sources (also known as "significant GHG emitters" or SGEs) both at the facility level and at the equipment/process level. SGEs could be individual, discrete pieces of equipment, such as a boiler, or could be sources from processes or equipment that, while individually small, are distributed widely enough to be significant, such as refrigerant leaks from chillers or air conditioners. Once SGEs are identified by estimation first, accurately determine the energy consumption and GHG emissions for these systems. Identify key variables that determine performance of SGE systems and collect, analyze, and track performance data.

Benchmark SGEs – Benchmark SGEs relative to similar systems to gauge performance. This can be done internally (e.g., across facilities within the same portfolio) or externally, depending on data

(cc) BY-SA Licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

availability. In the absence of reliable data on comparable systems, SGEs can instead be benchmarked against their own past performance. Benchmarking can be used to identify best practices and ideal operating conditions as well as opportunities for performance improvement.

Licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.