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 SEEC 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 implementing a SEEC 50001 Ready system, your organization may want to tackle just one or two SEUs initially. Over time, you can add additional SEUs to expand the boundaries of your EnMS.

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, 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
50001 Ready Playbook Task 09	Significant Energy Uses

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 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.

Learn More: **The SEEC Energy Footprint Tool**

The SEEC Energy Footprint Tool can be used to assist with data collection and analysis and serve as an input to the SEEC EnPI Lite regression analysis tool.

- **Footprint tool inputs:** The Footprint tool can actively track up to 20 types of energy sources (electricity, natural gas, etc.) and 20 related relevant variables (production levels, degree days, operating hours, occupancy rates, etc.) for up to a 10 year period. Customized energy types and related factors can easily be added as needed. Energy end-use is tracked on an annual yearly basis. Users can create up to 10 major energy end-use groups (process areas, building areas, boiler room, etc.) which each can include up to 30 individual components (boilers, fans, pumps, lights, etc.) which assists in determining the EnMS SEUs.
- **Footprint tool outputs**: The Footprint tool generates a series of charts and graphs based on the entered data. This allows for the comparison of energy types, monthly and yearly trends, and entered energy consumption (BTUs) vs energy end-use (application of energy). Comparing consumption to tracked end-use can help to determine how accurately the total "bottom-up" end-use compares to the "top-down" metered consumption and how much end-use energy consumption may be unaccounted for. The tool helps to determine the energy consumption of various energy end uses and thus help in determining the SEUs. Finally, the tool can also output energy data into a format that is compatible with the SEEC EnPI Lite tool in order to perform a regression analysis of energy consumption with other relevant variables like weather, production, and building occupancy.

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 8 Energy 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. 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 50001 Ready Playbook Task 09 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 50001 Ready Playbook Task 09 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

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.