Oak Ridge National Laboratory, TN – 50001 READY

BACKGROUND

The Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee, is the largest of the U.S. Department of Energy's (DOE) open science laboratories. Its mission is to deliver scientific discoveries and technical breakthroughs that accelerate the development and deployment of solutions in neutron science, global security, and clean energy while creating economic opportunities for the nation. ORNL hosts one of the world's most advanced high-performance computers to assist in research and to solve challenges in diverse scientific fields. Energy and water resources required to operate these systems makes energy efficiency a critical driver to ORNL's operations.

ORNL is familiar with the management systems standards approach to continual improvement with certifications in ISO 14001 (environmental management) and ISO 9001 (quality management) standards. Understanding the cost and environmental benefits of energy efficiency, the ORNL Facility Management Division (FMD) uses the EPA's Energy Star Portfolio Manager to track and improve energy performance in all metered buildings on its campus and participates in DOE's Better Buildings and Smart Energy Analytics initiatives. The ORNL FMD ensures federal compliance by conducting energy audits on the 65 buildings as part of this project's scope and dedicates annual operating funds for energy conservation projects.

To complement the benefits of investments in advanced metering technology, ORNL recognized the advantage of implementing a structured process to take its energy performance to the next level. The laboratory was in a prime position to deploy a system that could facilitate and document continuous energy and water usage reductions and help to improve operational costs.

SOLUTIONS

Recognizing the value of the ISO 50001 energy management standard, ORNL adopted 50001 Ready as a guide toward structuring an energy program and became a 50001 Ready facility in 2019. Since then, the lab's energy team has re-attested each year to reinforce its practices in continual energy improvement. Now in the third year of implementation, 50001 Ready continues to surpass expectations, and as a result the team is considering how to expand its role in ORNL energy management. The ORNL energy team has established a foundation for a sustainable and resilient network of facilities, with support across the organization.

The Oak Ridge National Laboratory (ORNL) re-attested to 50001 Ready in August 2022. *Photo credit: The Oak Ridge National Laboratory*

Implementing a 50001 Ready Energy Management System

- **Central Repository:** One of the greatest challenges of effective energy management for ORNL is navigating and tracking the various components that make up its energy management system. The 50001 Ready Navigator guidance and tools helped ORNL formally document its energy management processes and procedures and organize its data records. Following the Navigator's guidance, the team set up a central repository tailored to the specific needs of ORNL facilities, designing a work breakdown structure with color coding and links between related documents. The Navigator's structure allows the ORNL energy team to organize their ideas around how energy management fits into the larger organization.
- **Strategic Planning:** With the information architecture in place, ORNL employed the DOE 50001 Ready program to develop a plan of action. The energy team used data from newly installed meters to identify the facilities using the most energy. These buildings were then prioritized for energy conservation measures (ECMs), which, in turn,

were weighed based on potential impacts. Advanced utility meters can also be used to measure and verify the savings associated with the ECMs implemented, as well as assist in energy tracking and reporting throughout ORNL.

- **Leveraging Achievements:** The energy team met with ORNL's ISO 14001 compliance staff, who provided useful advice on the tasks, planning steps, and strategies for meeting energy performance goals while maintaining conformance to ORNL's broader sustainability goals. Being able to draw on the success of previous experience with ISO program structures accelerated the adoption of the 50001 Ready structure. The reverse has also proved true: 50001 Ready prepared the energy team to support ISO 14001 audits.

BENEFITS

50001 Ready provides an excellent structure for coordinating an organization's energy management program. With a framework in place, the energy team can plan ahead and begin work on ECMs well in advance of their scheduled implementation. 50001 Ready's energy management system structure and process have proven particularly beneficial when managing unpredictable operational conditions (e.g., as a result of the pandemic's effects), and has highlighted the lab's improved resilience. By remaining ahead of the curve, the energy team can take preventative and adaptive measures, as needed, rather than reacting to changing circumstances.

ORNL discovered a major value proposition of 50001 Ready after bringing in a new energy manager. The structure and documentation prepared for 50001 Ready greatly eased the transition for key team members. The information needed to effectively manage energy remained available and easy to understand and access.

50001 Ready has also helped achieve the wide scale and long-term buy-in necessary for sustained impacts. After implementing reporting and communications measures in accordance with guidance from the Navigator tool, the energy team used 50001 Ready to track communication and training that engages the ORNL workforce in energy-saving efforts and training opportunities that can benefit the energy program goals.

Among other messaging, team members are creating broad awareness of ORNL's significant energy consuming facilities and systems, and prioritizing ECMs for these facilities and systems. Guiding stakeholders through identifying significant energy uses and ECM planning reinforces ORNL's commitment to reducing energy baseline consumption. The methodical approach validates the energy management program and encourages others—including management—to align in common cause.

"ORNL's Energy Efficiency and Sustainability Team is very excited to receive the DOE 50001 Ready recognition. Its standardized approach and tools will pay great dividends at ORNL, especially with the unique, complex, and legacy facilities ORNL maintains for its state-of-the-art research mission."

– Kory Miike, Director, Facilities Management

KEY TAKEAWAYS

- Engaging stakeholders is key to an energy program's success. Every employee is different, from operational styles to familiarity with ISO 50001; but everyone has a role to play, and 50001 Ready has something for everyone. ORNL has a variety of strengths to leverage, both within and outside the organization, and engaging these assets can smooth implementation and optimize outcomes.
- 50001 Ready reinforces related initiatives, such as Better Buildings, and encourages organizations to take part—and to take actions aligned with those programs. Through 50001 Ready, ORNL has recognized the need to implement better knowledge management, operational improvement tracking process, and a comprehensive, long-term fault detection and diagnostic system.
- 50001 Ready steers an energy program while the groundwork is laid. While working toward becoming a 50001 Ready facility, the ORNL energy team carefully defined program scope and organized and documented work and processes. These first steps are critical to future successes. At this point, ORNL simply fine tunes their energy management system to accommodate facility changes and to meet evolving goals.
- The internal audit process allows for documenting and tracking action items or areas that are desired for program continual progression overtime. Each year, this process helps show the progress the energy program has made throughout the yearly re-recognition process.