

Volvo Group North America

WHY SEP 50001?

The U.S. Department of Energy's SEP 50001 program offers certification to organizations and facilities that achieve sustained excellence in energy management. To certify, organizations use an ISO 50001 energy management system to improve energy performance, and an independent third party verifies achievements. DOE offers elevated recognition at Silver, Gold, and Platinum levels to certified organizations that use best practices described in the *SEP 50001 Scorecard*.

Overview

Volvo Group North America has three interconnected U.S. facilities that have all received SEP 50001 recognition. The New River Valley plant in Dublin, Virginia, manufactures, paints, and assembles the full line of Volvo Class 8 heavy-duty trucks for the North American market. Mack Trucks Inc. in Macungie, Pennsylvania, also manufactures and assembles heavy-duty trucks, covering the full Mack North American product line. Volvo Powertrain North America in Hagerstown, Maryland, is engaged in manufacturing, assembling, testing, and painting diesel engines, axles, and transmissions for Mack and Volvo trucks; the New River Valley and Mack sites are its primary customers. Collectively, these facilities represent more than 7,000 employees, over 4.6 million square feet of workspace, and 85% of Volvo Group North America's energy use in the United States.

Volvo Group North America is part of Volvo Group, which recognizes the imperative to provide sustainable transportation solutions and has a plan to become climate-neutral by 2040. The first pillar in the Volvo strategy is energy efficiency, in which DOE programs play key roles. Along with the above-noted facilities' success in the SEP 50001 program, the company has 27 facilities involved in the DOE Better Climate Challenge and 13 in Better Plants.

Participation in SEP 50001 and use of a robust energy management system have helped the sites achieve their Better Plants goals. The New River Valley and Mack plants were already certified to ISO 9001 (quality management) and ISO 14001 (environmental management) when they began their efforts to add ISO 50001 and SEP 50001 to their lists of achievements;



Volvo New River Valley facility. *Photo credit: Volvo Group North America.*

Mack Trucks also boasts ISO 45001 (occupational health and safety). In 2012, the New River Valley facility earned SEP 50001 certification at the Platinum level—the highest level of recognition the program bestows—having improved its energy performance by 25.8% over three years. The following year, Mack Trucks was recognized by the program for achieving a 41.9% improvement over ten years. Hagerstown was the third addition to the list of SEP 50001 Volvo facilities, joining New River Valley at the Platinum level.

“SEP 50001 provides a systematic, robust, and verifiable approach to energy management.”

– Bert Hill, Manager, Health, Safety and Environment,
Volvo Group North America

Currently, Volvo's Mack Trucks and Hagerstown sites are in their fourth SEP 50001 certification cycle and New River Valley is in its fifth, so all have been ISO 50001 certified for at least nine years. (All organizations must apply for renewal every three years.)

Solutions

A Volvo facility begins the journey toward improved energy performance by identifying the significant energy users (SEUs). The energy team then ranks the SEUs, factoring in energy usage, risk potential, and importance to top management (e.g., whether an action would also help meet emissions reduction goals). For example, the Hagerstown ranking identified boilers, air compressors, and heat treatment as priority areas.

The facility then establishes an energy baseline, comparing projected energy use with actual energy use. This task serves as a “litmus test” to ensure that the energy team is accounting for everything that needs to be considered. The baseline is used to set targets and objectives. Finally, energy performance indicators (EnPIs) are used to track progress. ENPIs allow users to normalize results by accounting for variables (e.g., weather and production levels) that affect energy consumption.

The targets are monitored regularly, results are reported to top management, and are discussed in annual management reviews. This allows the facility to make adjustments and informs upper management of any need for additional support.

The corporate office takes on the critical role of coordination between the facilities. Ten years ago, Volvo formed an energy network, the Volvo Energy Network North America (VENNA), to share best practices between the facilities and increase the level of knowledge.

Key Takeaways: SEP 50001 Energy Management Strategies

- ▶ **Structure and accountability:** With targets and objectives from myriad sources—internal groups, ISO standards, local and global requirements, etc.—it is important to have a structure. SEP 50001 presents a way to organize, standardize, and prioritize objectives, as well as providing a format for reporting, which helps the organization to be accountable and to maintain proper documentation.
 - ▶ **Third-party verification:** Because the results are developed through detailed calculations and physical measurement and are verified, facilities can provide that information to others (e.g., Science Based Targets initiative, utility incentive programs, upper management) with confidence.
- We’re really proud of our involvement in SEP 50001. Over each certification period, our energy intensity improvement builds on the previous period, so all in all, we’ve been able to reduce our energy intensity by 62.2% since starting the SEP program. We received Platinum-level recognition for each of those periods.”***
- Dee Spolarics, Environmental and Energy Engineer,
Volvo Group Trucks Operations
- ▶ **Website as energy management system:** The sites’ energy management systems took the form of internal websites accessible to the whole facility. Through the websites, employees access work instructions, track performance, and organize documents in preparation for audits.
 - ▶ **Next-level energy management:** Already in their fourth or fifth certification cycle, the facilities have mature energy management systems. The SEP 50001 Scorecard provides ideas and credit for implementing best practices beyond the requirements of SEP 50001 and ISO 50001. Also, the facilities have already picked much of the “low-hanging fruit” and implemented numerous capital projects. They are now moving toward behavioral, operational, and maintenance measures, largely through teamwork. For example, employees are engaged in energy “treasure hunts” to identify low-cost energy savings opportunities. Involving the full staff ensures that simple but effective strategies are implemented.
 - ▶ **Outside expertise:** The Mack Trucks and New River Valley facilities have worked with **50001 Certified Practitioners in Energy Management Systems (50001 CP EnMS)** to assist with system implementation, calculations, record keeping, and administration, lightening the load for the energy team. The Association of Energy Engineers maintains a list of **credentialed 50001 CP EnMS**.

► **Equipment replacement:** When a facility needs to replace equipment or is expanding a department, the energy team makes sure that the most energy-efficient option is procured. Although more money may be spent upfront, the resulting savings add up quickly. Below are sample projects, along with the estimated benefits.

- High-intensity discharge (HID) and T8 lamp fixtures were replaced with LED and T5 fixtures for annual energy savings of ~31,000 MMBtu.
- A total heating system retrofit involved eliminating hot water heating by installing 120 infra-red heaters across the New River Valley plant (except for the office area, which now uses a more efficient unit). The annual energy savings are ~28,000 MMBtu.
- Controls were installed to connect the lighting schedule with operation and production activities. The system adjusts automatically for time of day and plant closures (weekends and holidays). Annual energy savings are ~14,000 MMBtu.
- Two new 500 HP variable-speed compressors with desiccant dryers replaced four fixed-speed 200 HP compressors with inefficient air drying. The net annual energy cost savings average \$164,250.
- Hagerstown retrofitted crankshaft grinders with grinding machines that use computer numerical control (CNC). Thirteen machines now do the work of three. The new machines process more crankshafts per day while reducing electricity consumption by 56%.

► **Measuring the efficiency of expanded production:** When a facility is expanding and, as a result, is increasing energy consumption, the energy team calculates how much energy would have been used if the new energy performance tools, tricks, and techniques were not applied. For example, Hagerstown is sourcing a second furnace for heat treatment, which will allow for greater production volume but will also add to energy consumption. However, without using recuperative burners and



Conducting an energy assessment with the West Virginia University Industrial Assessment Center. Photo credit: Volvo Group North America.

capturing waste heat, the amount of additional energy would be considerably more. In short, the facility can do more with less, thanks to the strategies that have been established.

Other Benefits

ISO 50001 has provided clear benefits in terms of cost and energy savings. The structured system has also helped keep management attention on energy issues.

In addition, some less tangible benefits are coming to light. The Volvo facilities are receiving recognition from both internal and external stakeholders, thanks to the focus on sustainability and successful program implementation.

There have also been health and safety benefits. For instance, when searching the HVAC system for leaks, staff found some loose filters in the system. Fixing the issue improved air quality.

Finally, getting all the employees involved—including staff from other divisions (e.g., finance)—helps each facility become a well-rounded, well-oiled machine.

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