CEC's Work on Stimulating Uptake of ISO 50001 Energy Efficiency Standard (2015–2018)

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Long-term Impact Assessment

Between 2015 and 2018, the Commission for Environmental Cooperation (CEC) implemented two projects aimed to "position ISO 50001 and the Superior Energy Performance (SEP) program as key mechanisms to reduce greenhouse gas emissions, improve energy management, increase energy efficiency, reduce energy costs, and improve competitiveness in select North American industrial sectors" [CEC 2023]. Designed through a CEC-industry partnership cost-sharing strategy, the first project [Accelerating Adoption of ISO 50001 and Superior Energy Performance Program Certification in North America (2015–2016)]—was launched with a budget of C$300,000. The project focused on building capacity in three directions: establishing common requirements for Certified Practitioners in Energy Management Systems (CP EnMS), piloting an end-user cohort-training model, and developing training materials and tools.

Eighteen (18) facilities across nine (9) companies (3M, ArcelorMittal, BMW, Cargill, Cummins Inc., Ingersoll Rand, Intertape Polymer Group, New Gold, and Titan America) participated in this first pilot project.

In 2017, the CEC undertook a second two-year project: Increasing Industrial Energy Efficiency through ISO 50001 (2017–2018), this time committing C$600,000. This project was now targeted at original equipment manufacturers (OEMs) and their supply chains. This second CEC-industry partnership project led to two Nissan cohorts (a Mexican cohort and a United States cohort), involving 11 facilities across eight (8) companies (Nissan, Sannoh, IAC, Calsonic Kansei, and Varroc Lighting in Mexico and Shape Corp, ArcelorMittal, and Mitsubishi Electric Automotive America Inc. in the United States).

Acknowledging the potential value of the projects to better understand and extract lessons from CEC partnerships with the private sector, a long-term impact assessment was carried out in 2023, measuring the impact of the projects to date and identifying potential opportunities for the future.[1]

1. The full report is available upon request. Please contact **José Antonio Casis García** at jacasis@cec.org for further details. The report was conducted by SR Management Consulting.

ASSESSMENT METHODOLOGY

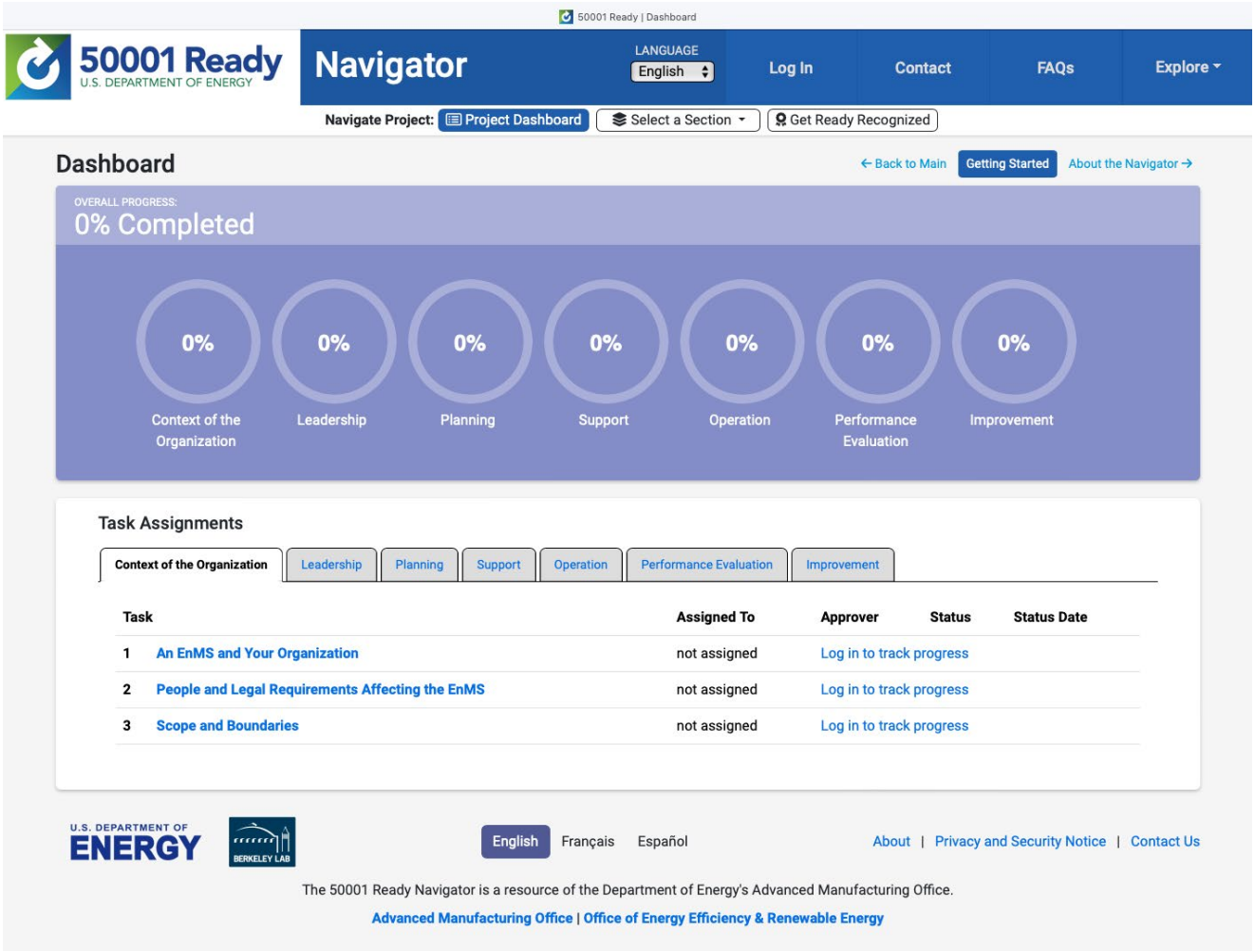
Conducted between September-December 2023, the assessment posed five (5) questions:

(i) What impact did industrial training have on ISO 50001 and/or SEP certification?
(ii) How have the ISO 50001 training, training tools and case studies been deployed to support the further uptake of ISO 50001 and/or SEP in other facilities or other companies?
(iii) What third-party-verified energy savings and greenhouse gas reductions resulted?
(iv) What uptake barriers and strategies for mitigating them can be identified as a result of the experience gleaned through the projects?
(v) What can be learned from the projects' partnership and cost-sharing approach for stimulating environmental impact and industrial change?

Answers to these questions came from a multifaceted assessment of document reviews (300+ documents), stakeholder interviews, and a training impact survey, product assessment [two (2) case studies and a guide] and third party-verified data to confirm facility energy savings and greenhouse gas reductions.

Energy performance improvements

With 61% of the 2015-16 ISO Pilot participants becoming ISO 50001 certified, **considerable energy savings and greenhouse gas reductions were realized through the project's activities**. Third-party verified data captured by the DOE Better Buildings, DOE EERE, Clean Energy Ministerial, and CEC Case Studies reported energy performance improvements ranging from 2.8% to 29% over a three- or four-year period (timeframe unique to each facility). The average energy performance improvement by the 11 facilities, which became ISO 50001 certified, was 4.08% per year.



ABOUT ISO 50001 INDUSTRIAL ENERGY EFFICIENCY PRACTICES

Introduced by the International Organization for Standardization (ISO) in 2011, ISO 50001 is a voluntary energy standard that "supports organizations to address their impact, conserve resources, and improve the bottom line through energy efficiency" [ISO 2023]. The United States Department of Energy (DOE) Better Buildings sought to recognize sustained excellence in ISO 50001 practices, leading to their development of the Superior Energy Performance 50001TM (SEP 50001TM) program. This "gold standard" certification approach is intended to "further drive energy performance improvement" and enable facilities or organizations that achieve sustained excellence to achieve "elevated levels of recognition" [DOE 2023]. Not all organizations seek formal certification. A growing number of organizations see value in using ISO 50001 as a strategy to "build a culture of structured energy management and improvement" [DOE 2023]. In response, the ISO 50001 Ready, no-cost, online navigator platform[2] was built as a step-by-step tool to support and guide organizations toward energy efficiency. The 50001 Ready Navigator is a resource of the Department of Energy's Advanced Manufacturing Office.[3]

2. Available at: <https://navigator.lbl.gov/>.
3. For more information, please visit: <https://navigator.lbl.gov/#:~:text=The%2050001%20Ready%20Navigator%20is,from%20an%20energy%20management%20system>.

MAIN FINDINGS

Impact of industrial training on ISO 50001 and/or SEP certification

Between 2015 and 2019, 108 employees of the participating companies were trained by the Georgia Institute of Technology in ISO 50001: 74 during the 2015–2016 ISO pilot and 34 during the 2017–2018 ISO Supply Chain project. Nine (9) of these individuals received extensive training and became designated Certified Practitioners in Energy Management Systems (CP EnMS). Ultimately, the training led 61% of facilities (11 of 18) participating in the 2015–2016 ISO Pilot to become ISO 50001-certified.

None of the supply chain facilities participating in the Nissan Cohorts of the 2017–2018 ISO Supply Chain project became certified. Those interviewed speculated that smaller companies farther down the supply chain have insufficient human capacity to implement the breadth of ISO 50001. However, the cohort training model developed for the 2015–2016 ISO pilot project continues to be used by the US Department of Energy (DOE) and those certified as CP EnMS. One of those newly trained, and designated as CP EnMS, reported training in turn more than 500 individuals globally on an annual basis in ISO 50001, using the cohort training model—ISO 50001 Ready navigator framework—and methodologies learned through their own training during the projects.

Support of ISO 50001 and/or SEP in other facilities or companies

Three publications were created as part of the 2017–2018 ISO Supply Chain project: Supply Chain Energy Efficiency through ISO 50001: A How-to-Guide for Your Company, and two case studies: Ingersoll Rand Manufactura S. de R.L. de C.V., Monterrey, Nuevo León, Mexico; and Cummins Filtracíon SLP, San Luis Potosí (SLP), Mexico. The ISO 50001 Ready navigator platform was also translated into Spanish and French. Digitally accessed data from the CEC's website and captured between August 2022 and October 2023 reveals that there continues to be interest (albeit modest) globally, with more views and downloads recorded outside North America than within its borders. None of the products are digitally accessible through the primary stakeholders of the CEC's ISO 50001 projects, namely DOE, NRCan or CONUEE.

The ongoing impact from the projects is shown in four directions. Titan America, Cummins, 3M and Nissan are expanding ISO 50001 certification at facilities globally, reinforcing the value of EnMS. The DOE reported its 6,000th client registration on the ISO 50001 Ready navigator on 2 November 2023. A decarbonization layer has been added to all 25 divisions of the platform to heighten the opportunity for greenhouse gas reduction as part of energy management. In 2022, Canada licensed the navigator as ISO 50001 Ready Canada, and it is now an active part of Canada's industrial energy efficiency approach.

Third-party-verified energy savings and greenhouse gas reductions

The 2015–2016 ISO pilot project goal to achieve an "average 10 percent source energy savings (or 100,000 MM Btu source energy per year) at five (5) North American facilities by end of 2017" [CEC 2015] was realized at two (2) of three (3) sites reporting direct energy savings: ArcelorMittal Dofasco and Cummins San Luis Potosí.

The 2015–2016 ISO pilot project set out to achieve an "average 5,500 metric tons of CO_2 equivalent reductions at five North American facilities by the end of 2017" [CEC 2015]. Given that data on greenhouse gas emissions reductions are available for only a few of the participating companies, it is not possible to confirm whether this project goal was met. Of those reporting data, only one facility met this target: ArcelorMittal. Three companies (Ingersoll Rand, Cummins, and ArcelorMittal) reported total CO_2 reductions of 404,147 metric tonnes per annum, an average of 44,826 metric tonnes per year. In addition, both Titan America and Cargill reported considerable CO_2 reductions of 280,320 metric tonnes and 462,000 metric tonnes, respectively, but these figures are inclusive of other facilities beyond those participating in the ISO 2015–2016 ISO pilot project. Data were not available for any of the companies that participated in the 2017–2018 ISO Supply Chain project.

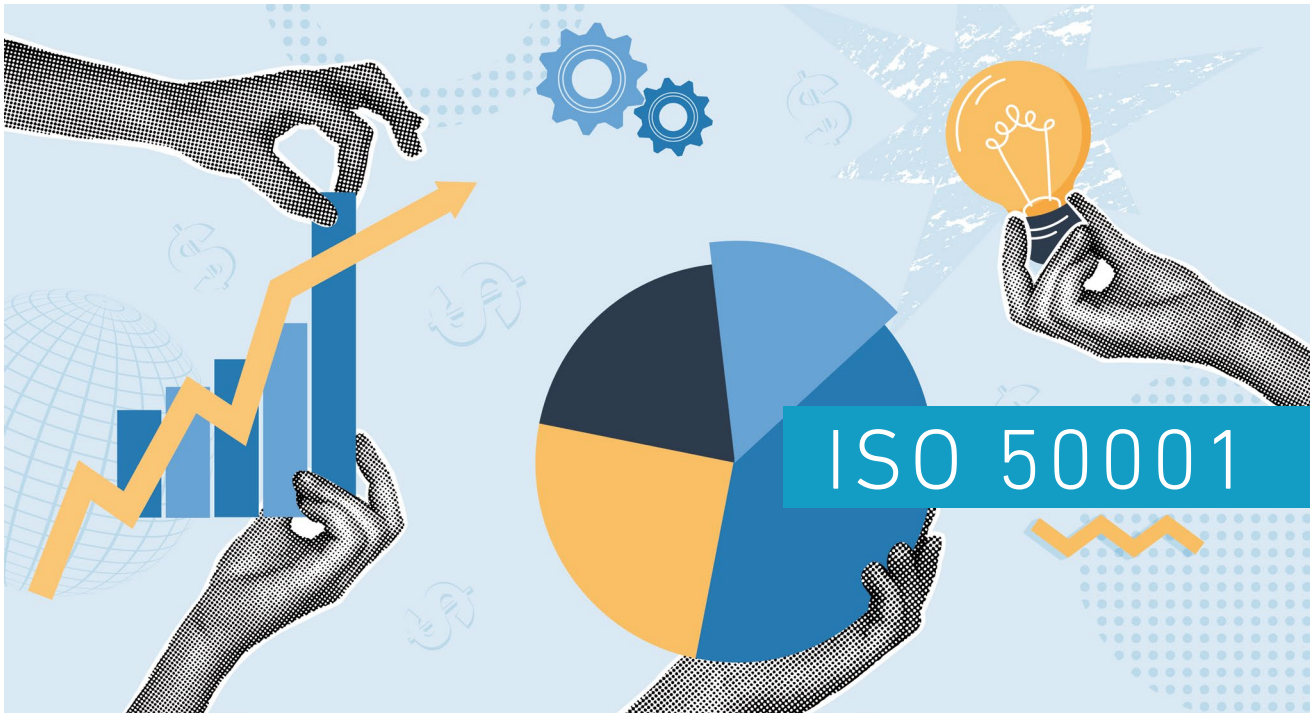
Barriers and mitigation strategies

Two key ISO 50001 uptake barriers were identified over the course of the CEC's two projects: participation drop-off and supply chain recruitment. In some instances, participation drop-off undermined long-term, sustained participation and commitment among some employees and/or facilities. Reasons for drop-off included: the prolonged period over which some elements of ISO 50001 training were delivered, the advanced level of that training, events that interrupted or redirected human involvement, and higher-level organizational commitment (e.g., large-scale non-energy related project implementations, facility wind-downs, expansion activities). One way of solving the drop-off challenge is the presence of leaders of the "C-level suite" who support and commit to EnMS themselves, backed by strategic objectives to improve energy efficiency or decarbonization across the organization.

The 2017–2018 ISO Supply Chain project resulted in a better understanding of how to engage supply chains, for instance: a model that targets OEMs and their Tier 1 suppliers can strategically benefit from the push from OEMs and the pull from Tier 1 suppliers. These relationships are typically stronger, the investment and value exchange are more substantial, the communication paths are more established, and the Tier 1 suppliers are likely larger, more invested, and unwilling to risk losing the OEM. Germany's widespread presence of ISO 50001-mandated supply chains for OEMs is an example that could provide useful direction for future programming in this regard.

Lessons learned

Interviews undertaken as part of this long-term impact assessment uncovered two lines of thought regarding the effectiveness of the CEC-industry cost-sharing model for company participation. On the one hand, it is argued that a "user-contribute" model provides incentive for sustained and meaningful participation throughout the project period. On the other hand, the cost-sharing amount of C$12,500 was insubstantial in comparison to an overall investment in a project that nears C$1 million. In considering these perspectives, the CEC-Industry partnership approach could be crafted differently as a strategy of required commitments (e.g., hosting workshops, preparing case studies, presenting outcomes, and impact reporting) that contribute materially to the success of the project. This partnership structure would better serve the goals of the CEC and provide the CEC with built-in communication, impact reporting, and sectoral ISO 50001 awareness-raising.



NEXT STEPS

The interview process provided the opportunity to canvas stakeholders about what next steps could be undertaken to stimulate the uptake of ISO 50001 and SEP as "key mechanisms for reducing greenhouse gas emissions and improving energy efficiencies in the industrial and commercial sectors of North America" [CEC 2015]. Recommendations extend in three directions:

(i) Without exception, all interviewees recommend that a further project be undertaken by the CEC; the preference being a modified ISO 50001 Supply Chain project targeted to OEM+Tier 1 suppliers; potentially those focused on the petrochemical or technology sectors.

(ii) Mexico should license the ISO 50001 Ready navigator, joining the United States and Canada in providing a consistent mechanism of recognition and standards in North American industrial energy management.

(iii) Several strategies could be developed to further engage industrial North America, including targeted messaging, following up contacts, and enhanced visibility for participating companies.

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