Superior Energy Performance^{cm}: A Roadmap for Continual Improvement in Energy Efficiency

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ABSTRACT

Superior Energy Performance^{cm} (SEP) is a forthcoming voluntary certification program that will move industrial and commercial facilities onto a path of continual energy performance improvement while maintaining competitiveness. This article describes the certification program for U.S. industry; pilot testing and results to-date; and benefits to collaboration partners that deliver the program, such as state programs, utilities, and supply chain partners. SEP certification requires facilities to conform to all requirements of ISO 50001, the first global energy management system standard, and to demonstrate energy performance improvement as specified in MSE 50021, a forthcoming standard. Facilities must demonstrate improved energy performance using the program's transparent, globally accepted, verification system. SEP is envisioned to foster market demand for verified, sustained improvements in energy performance and to increase adoption of the ISO 50001 standard. The standard, developed with input from representatives from more than 50 countries, is broadly applicable to various sectors of national economies and could influence as much as 60% of the world's energy demand [1]. At the international level, the Global Superior Energy Performance partnership is working to harmonize a range of nationally accredited energy performance certification programs that reward strategic energy management and third-party-verified energy reductions.

INTRODUCTION

The Superior Energy Performancecm (SEP) certification program applies to the certification of industrial or commercial facilities that conform to the ISO 50001 international energy management standard and obtain third-party verification of an improvement in energy performance, as specified in the forthcoming MSE 50021 standard. It is a voluntary program that provides industrial and commercial facilities with a roadmap for achieving continual improvement in energy performance while maintaining competitiveness [2].

A central element of SEP is the implementation of the ISO 50001 global energy management standard. The program includes additional requirements for achieving and documenting energy performance improvements. These requirements are documented in MSE 50021. SEP will provide companies with a framework that fosters energy efficiency at the facility level and a methodology for measuring and verifying energy performance improvements.

The U.S. Department of Energy (DOE) partnered with the U.S. Council for Energy-Efficient Manufacturing (U.S. CEEM) to develop the SEP program for industry, which will be launched nationwide in 2012. The partnership brings together the respective strengths of industry, standards-making bodies, federal agencies, national laboratories, universities, and technical experts.

DOE owns the Superior Energy Performancecm certification mark and will accordingly license the use of the mark to facilitate delivery through private sector organizations. Although federal funds supported the development of the SEP program, it is designed as a nongovernmental program that will transition to a self-administered, fee-based entity in 2014. SEP supports attainment of the 2015 goals that the DOE Advanced Manufacturing Office (AMO), formerly known as the Industrial Technologies Program (ITP), seeks to achieve in partnerships with stakeholders:

- Save over 400 trillion Btu annually industry-wide
- Influence 35% of manufacturing energy end use
- Engage 10,000 plants (5,000 through supply chain initiatives) to continuously improve energy management
- Certify 750 industrial plants through the SEP program

SEP is accredited by the American National Standards Institute (ANSI) and the ANSI-American Society of Quality (ANSI-ASQ) National Accreditation Board (ANAB). (Note: This accreditation is in process and not final at the time of this writing.) The Superior Energy Performance program for commercial buildings will launch later, as these programs are still under development.

REQUIREMENTS FOR CERTIFICATION

SEP is designed to encourage participation among facilities of all sizes and levels of experience in actively managing energy performance. The program offers two methods of verifying results, depending on the depth of verification desired by a facility. Facilities will apply to become "Partners" or "Certified Partners," depending on the value they perceive for verification or certification of savings and management practices. (See Table 1.)

All facilities applying to SEP must conform to the ISO 50001 energy management standard and the MSE 50021 standard, which requires a demonstrated improvement in energy performance. Because ISO 50001 does not prescribe specific performance criteria or results with respect to energy performance, the MSE 50021 standard will specify the SEP program performance tiers and requirements beyond ISO 50001. The MSE 50021 standard is currently in development by the Georgia Tech Energy & Environmental Center (GTEEMC), an ANSI-accredited standards developer, and will be proposed to ANSI for approval as an American National Standard.

Table 1. Superior Energy Performance: Tiers and Summary of Requirements

	Partner	**Certified Partner**
Criteria	• Conformance with ISO 50001 • Measure and audit energy performance improvement	• Conformance with ISO 50001 • Measure, verify, and certify energy performance improvement
Performance Levels	• Energy performance improvement required	• Energy performance improvement required, minimum levels set by program • Two pathways available: Energy Performance or Mature Energy
Method of Verifying Results	• Self declaration with internal company audit	• ANSI-ANAB accredited certification with onsite visit by third-party audit

ISO 50001 Energy Management Standard

SEP requires that a facility's energy management system conform to ISO 50001. Published in June 2011, ISO 50001 is compatible with widely used management system standards such as ISO 9001 and ISO 14001. Conformance to ISO 50001 demonstrates that an organization has sustainable energy management systems in place, has completed an energy use baseline, and has made a commitment to continual improvement in energy performance.

Implementing an energy management system will enable facilities to realize greater persistence in energy savings and higher returns on energy efficiency investments. Corporations, supply chain partnerships, utilities, and energy service companies can use ISO 50001 as a tool to improve energy performance and reduce carbon emissions in their own facilities as well as those belonging to their customers or suppliers. The standard does not prescribe specific performance criteria or results with respect to energy.

MSE 50021: Additional Requirements for Energy Management Systems

All facilities applying to SEP must demonstrate improved energy performance, as outlined in MSE 50021 and its normative references, which include the SEP Measurement and Verification Protocol.

VERIFICATION

All participating facilities are required to verify conformance to ISO 50001 and achievement of energy performance improvement using the SEP Measurement and Verification Protocol. Two methods for verifying results are offered:

- *Self-declaration*: Facilities applying to become SEP Partners will self-declare their conformance to the program requirements. Self-declaration may include audits conducted by team members within the facility or by off-site representatives.

- *ANSI-ANAB accredited certification*: Facilities applying to become SEP Certified Partners will submit required material to an ANSI-ANAB accredited verification body. The verification body will conduct a SEP conformity audit.

SEP Measurement and Verification Protocol for Industry

Each active SEP-defined sector will have a sector-specific energy performance measurement and verification protocol defined and documented. Appendix A lists the sectors under consideration. Currently the SEP Measurement and Verification Protocol for Industry has been developed and applies to two sectors, industry-light to medium, and industry-heavy. A SEP Measurement and Verification Protocol for Commercial Buildings is under development. Sector-specific SEP measurement and verification protocols for additional sector types will follow.

All participating industrial facilities are required to verify conformance to ISO 50001 and MSE 50021 using the SEP Measurement and Verification Protocol for Industry. The protocol will offer a best practice methodology to (1) verify implementation of the energy management standard, (2) track the extent to which the facility's energy performance changes over time, and (3) document normalized energy performance. The SEP Measurement and Verification Protocol for Industry has been designed to document the establishment of normalized energy performance indicators and to verify resulting energy performance improvement.

The SEP Measurement and Verification Protocol for Industry is intended to emphasize reliability in the consistency of reporting, sustainability of results, and credibility of assertions. A range of stakeholders has helped to develop the protocol, including industrial end users, utilities, regulators, energy efficiency organizations, and the measurement and verification community. However, facilities wishing to use their energy performance achievements to qualify for third-party incentives or recognition by outside programs may need to satisfy additional requirements as may be specified by those programs.

Performance Levels for SEP Certified Partners (Industrial Facilities)

To encourage industrial facilities to achieve greater energy performance levels, the SEP program for industry allows candidates seeking ANSI-ANAB accredited certification to apply for Silver, Gold, or Platinum status, based on their demonstrated energy performance.

SEP for industry provides two pathways for achieving a Certified Partner designation: the "Energy Performance Pathway" and the "Mature Energy Pathway." Most industrial facilities will qualify through the Energy Performance Pathway, which requires facilities to achieve a certain percentage of improvement in energy performance. However, it

is recognized that industrial facilities that have mature energy management programs in place and have already identified and implemented efficiency improvements for the last decade or more may face greater challenges in achieving high percentages of further improvement in energy performance. The Mature Energy Pathway offers these facilities an alternate pathway that takes into account the maturity of a facility's energy management system, improved energy performance, and continued efforts to institutionalize performance best practices.

Industrial facilities participating through the Mature Energy Pathway will use the SEP Industrial Facility Best Practice Scorecard to assess the maturity of their facility's energy management system to qualify for certification. The scorecard offers credits for energy management system activities, processes, or procedures that are exhibited by "best in class" companies. The guidance in the SEP Industrial Facility Best Practice Scorecard provides details about the credits and approaches that can be implemented to achieve them. The SEP Industrial Facility Best Practice Scorecard also lists measurement and verification activities that an auditor may use to verify each credit [3].

SEP Verification Bodies

ANSI-ANAB accredited verification bodies will perform verification for the SEP program. The SEP verification body will conduct a SEP conformity audit, which includes a Stage 1 audit to determine whether the facility is prepared for the Stage 2 audit. The SEP verification body will then send a SEP audit team composed of a SEP lead auditor and SEP performance verifier(s) to the facility to assess conformance to ISO 50001 and MSE 50021 and verify any energy performance improvement using the appropriate sector-specific SEP measurement and verification protocol.

To issue SEP certification, verification bodies are legally required to hold a valid ANSI-ANAB accreditation. ANSI-ANAB will be the only recognized SEP accreditation body. Forthcoming American National Standard MSE 50028 will define the requirements for ANSI-ANAB to use in accrediting verification bodies for SEP. This standard incorporates requirements in ISO 17021, conformity assessment for bodies providing audit and certification of management systems, and further defines SEP requirements beyond ISO 17021 to ensure that SEP verification bodies operate energy management system certification and energy performance verification in a competent, consistent, and impartial manner.

Certified Practitioners for Measurement and Verification: SEP Lead Auditors and Performance Verifiers

The Institute for Energy Management Professionals (IEnMP) will accredit SEP lead auditors and performance verifiers that will serve as third-party auditors for the stage 2 audit of the SEP conformity audit to verify that a facility meets SEP requirements.

- SEP *lead auditors* assess a manufacturing facility's energy management system conformance to ISO 50001 and additional SEP requirements. These additional requirements are documented in MSE 50021.

- SEP *performance verifiers* assess a manufacturing facility's conformance to (1) the measurement and verification protocols and (2) the energy performance improvement levels defined by the SEP program.

The SEP program will help to build the expertise required to fill these auditor positions by developing Certified Practitioner credentialing programs. SEP lead auditors and performance verifiers will be subject to a rigorous qualification exam and, once certified, periodic professional enrichment requirements. The exam, training curriculum, and educational and experience requirements are under development.

ELECTIVE RESOURCES TO PREPARE FACILITIES FOR CERTIFICATION

Specialized resources are either currently available or in development to help facilities implement an energy management system and achieve results for participation in the SEP program.

System Assessment Standards

ASME has developed standards for conducting assessments of several types of energy systems that are widely deployed in industrial facilities: process heating, pump, steam, and compressed air systems. These standards provide a basis for facility operators to measure energy efficiencies, optimize fuel utilization, and improve environmental performance. The standards set the requirements that need to be performed

during the assessment but do not provide guidance on how to perform a system assessment.

Accompanying guidance documents assist users in applying the standards. The guidance documents provide the rationale for the technical requirements, technical guidance, application notes, and alternative approaches, tips, techniques, and rules of thumb. Guidance documents do not set any new requirements; the standards may be used with or without the guidance documents.

These assessment standards and guidance documents are not required for SEP; however, they define a clear pathway for participants to quickly achieve energy savings. The standards and guidance documents are available for purchase on the ASME website [4].

Certified Practitioners for Managing Energy and Assessing Energy Efficiency Opportunities

Personnel with significant training and skill will be required to appropriately apply the ISO 50001 and ASME system assessment standards in facilities that wish to pursue SEP certification. Two Certified Practitioner credentialing programs will help build this expertise in the workforce:

- *Certified Practitioners in Energy Management Systems* will assist facilities in implementing the ISO 50001 energy management standard.

- *Certified System Practitioners* will assist facilities in conducting energy system-specific assessments (conducted in accordance with ASME system assessment standards) and establishing procedures for continually improving energy performance in these systems. Certification will be system-specific.

These practitioners can include facility personnel, consulting professionals, or service providers with the appropriate technical expertise in industrial and commercial energy systems. The Certified Practitioner credentials will establish the credibility of professionals performing these services and help ensure proper applications of the standards. The credentialing programs will also help potential users of these services to locate a qualified Certified Practitioner.

A company or facility may use the energy management standards or system assessment standards without engaging a Certified Practitio-

ner. However, using a qualified individual adds a level of assurance that the standards will be properly applied.

Energy Management Tools

DOE offers free software tools, training, and technical information for continually improving industrial energy performance. DOE's online Energy Management Portal, which will soon be accessible through the DOE website, will feature an Energy Management Tool Suite with resources to help companies implement energy management systems consistent with ISO 50001. The site will provide downloadable software tools organized by energy management activities at the project, facility, and corporate level. The portal will also provide information on standards and protocols, and online training to help facilities meet SEP requirements. Facilities seeking SEP certification will also have access to web-enabled versions of software tools, with the option to store facility data in a secure area for future updating or use in other tools.

RESULTS

Texas Pilot Program (2008-2010)

By April 2011, five manufacturing facilities had qualified for SEP certification through a pilot program in Texas, achieving certified energy performance of 6.5% to 17.5% over a period of three years. (See Table 2.) These facilities tested the elements of the SEP program from 2008–2010 to verify that the program was practical and achievable, benefitted participating facilities, and demonstrated that certification criteria can be met. These facilities represented a range of industrial sectors,

Table 2. First Facilities Certified To Superior Energy Performance Through Texas Pilot Projects

Facility Name and Location	Percentage of Energy Performance Improvement over Three Years
Cook Composites and Polymers Co. – Houston, Texas	14.9%
Freescale Semiconductor, Inc. – West Austin, Texas	6.5%
Owens Corning – Waxahachie, Texas	9.6%
Dow Chemical Co. – Texas City, Texas (manufacturing facility)	17.1%
Dow Chemical Co. – Texas City, Texas (energy systems facility)	8.1%

size, and experience in energy management. Because ISO 50001 was still in the early stages of development at the start of this pilot project, the Texas pilot program facilities met SEP requirements by conforming to the American National Standard for Energy Management, ANSI MSE 2000-2008. They also tested the additional SEP requirements that were eventually documented in MSE 50021. Each participating facility elected to pursue the Energy Performance Pathway for certification.

The Texas pilot facilities provided constructive feedback that impacted the design of the SEP program. For example, the program originally considered an option for facilities to achieve certification via a remote review to verify results if an on-site review was undesired. The pilot facilities tested both the remote and on-site review methods and found that the paperwork for the remote review was labor-intensive and that phone calls with the auditor were time-intensive. Describing the complexity of a facility's energy systems to an auditor remotely can be more complicated and time-consuming than an on-site tour. Typically, auditors charge for the amount of time they spend working with a facility. In many cases, the amount of time spent communicating with the remote auditor would have greatly increased the auditor costs. Following pilot facilities' feedback, the remote review for verifying results was removed as a way of qualifying for SEP, but it may be reintroduced if advancements in technology enable the facilities and auditors to share information more efficiently in the future.

The Texas pilot facilities also confirmed the benefits of implementing an energy management system and pursuing SEP certification. Many participants realized cost savings without large investments in capital. For example, Cook Composites and Polymers achieved a 14.9% energy performance improvement without any capital investment. When facing risks of increased energy costs, the pilot participants found that energy management was more effective for lowering energy costs than seeking the lowest price of energy.

A cross-functional energy management team at the facility was credited with maximizing the effectiveness of the energy management system. The pilot facilities cited that behavioral changes and corporate culture contribute to the effectiveness of energy management programs. Engaging various levels of staff—plant management, financial, engineering, operations, facility maintenance, procurement, and production process line staff—helped identify a wider range of energy savings opportunities. Each job position contributed a different set of expertise,

and energy management became a shared responsibility.

Overall, the pilot facilities viewed the energy management structure as similar to other management systems, such as safety, health, environment, and quality. Some facilities reported that energy management became part of their business model—a shift from a project-by-project approach to finding energy savings.

DOE SEP Demonstration Projects (2009-present)

DOE is conducting additional demonstrations in partnership with states, regions, and utilities to further test SEP and build local energy management expertise. The first of these demonstration projects launched in 2009, and additional projects launched throughout 2010 and 2011. As of November 2011, there were 33 facilities progressing toward meeting SEP requirements through these projects. (See Figure 1.)

The DOE SEP demonstration projects span the Northwest, Southeast, Midwest, Mid-Atlantic, and Northeast regions, along with California, Colorado, and Texas (round two). The state or region agrees to identify an appropriate industrial facility well-suited to implement ISO 50001 and pursue SEP, according to guidelines suggested by DOE. The

3M	Holcim
Alcoa	JR Simplot
Allsteel	Kenworth Trucks
Amcor PET	Lockheed Martin
Bentley Prince Street	MedImmune
Bridgestone Tire	Neenah Foundry Company
CocaCola Refreshments	Nissan
Cook Composites & Polymers	OLAM Spices
Cooper Tire	Schneider Electric
Cummins	Sherwin-Williams
Didion Milling, Inc.	Spirax Sarco
Dixie Chemical	Traco
Dow Chemical	UTC/Sikorsky
Eaton	United States Mint
General Dynamics	Volvo
Harbec Plastics	World Kitchen
Haynes International	

Figure 1. Industrial Facilities Participating in U.S. Department of Energy Superior Energy Performancecm Demonstration Projects

state or region is also responsible for recruiting energy management consultants who coach the facilities. DOE provides in-person training sessions to the facilities and consultants, while the consultants receive monthly training for 15 months. The state or regional coordinator holds quarterly reviews with the demonstration facility's management team and the consultants to address any concerns about the projects. Upon completion of the project (as early as 18 months after the initial training session), the facilities are ready to apply for SEP.

STAKEHOLDER PARTICIPATION AND OPPORTUNITIES

The benefits of SEP extend beyond industrial facilities to other stakeholder groups, including state and local programs, utilities, and supply chain partners who work with industry to promote progressive energy efficiency improvements and sustain the benefits of energy efficiency projects over time. SEP provides a strategic, transparent framework with third-party verification for continual improvements in energy performance. The program's data-driven approach supports systematic decision-making and project prioritization, thus enabling identification and implementation of a broader range of projects. Implementation of an energy management system leads to greater persistence towards energy savings and encourages operational changes that generate additional energy savings beyond capital projects.

States

Decisions to engage in energy efficiency activities and projects are closely tied to local factors, including energy price structures, local public policies (both legislative and regulatory), types of manufacturing concentrations in the region, and economic and development issues. SEP can help state and regional programs build energy management expertise.

On a policy level, states can advance programs and policies that are supportive of industrial efficiency at state and local levels. Establishing a preferred supplier status for state procurement that encourages or requires SEP certification could build the market for SEP while helping the state to identify suppliers that are committed to energy management and energy efficiency. In addition, states can advocate for the program on the electric utility regulatory side.

Existing federal and regional resources can support state program efforts to deliver resources to industrial customers. For example, state programs can work with DOE to cosponsor workshops and training on industrial energy systems. State industrial efficiency programs that have limited budgets can focus on recognition opportunities for companies that become SEP certified. Recognition by the state could potentially bolster a plant manager's status within the company and help the manager obtain funding or other resources from management for energy projects.

Current Activities

DOE is partnering with the U.S. CEEM, states, and regional teams to conduct SEP demonstration projects. Companies participating in the demonstrations test the elements of SEP and receive training and coaching from the state and regional teams to implement an energy management system.

The state and regional teams have recruited consultants who will begin to build local capacity to engage manufacturing facilities on energy management. These consultants will be trained on how to implement ISO 50001 and will have the opportunity to pursue professional certification for proficiency in implementing an energy management system.

Utilities

Some manufacturing facilities view their utility as the prime source for energy efficiency information. Electric and gas utilities can use the SEP program as a means to strengthen their technical assistance and incentive programs for industrial customers. SEP is a turnkey solution that can enable utilities to deliver energy efficiency resources without adding infrastructure. By working with customers to qualify for SEP, utilities will be able to reward customers for their overall facility energy efficiency gains and thus create longer-term partnerships that stimulate more sustainable and continuous energy savings.

Examples of the most effective utility programs include prescriptive incentive programs; custom incentive programs; training/ education/ outreach services, including energy management support; technical assistance and energy auditing services; and self-direction programs. Prescriptive incentives target investments in specific types of energy efficiency equipment deemed worthy of rebate by the utility [5].

Custom incentives cover other types of energy efficiency investments not covered by prescriptive programs and enable the system-wide approach to energy management that is central to SEP. Offering both prescriptive and custom incentives will provide industrial customers with flexible options for implementing SEP.

Technical assistance and continued guidance on energy projects are also key components of effective utility industrial energy efficiency programs. Utility representatives can seek SEP Certified Practitioner credentialing as an opportunity to increase energy efficiency expertise among their personnel. Utilities will be prepared to respond to their customers' growing interest in energy management and provide support to help them meet SEP requirements.

Self-direction programs offered by many utilities grant credits to large customers that make investments in energy efficiency without outside assistance. Self-direction enables companies to apply part of their electricity charges to internal energy efficiency projects. The utility then evaluates these projects and counts the energy savings toward the utility's energy savings goals or requirements [5]. The rigor of the SEP Measurement and Verification Protocol for Industry can provide utility regulators with a greater level of confidence that utility incentives are returning high energy savings from ratepayer funds. Third-party verification of energy performance improvements through SEP can support a more flexible approach by public utility commissions in verifying expenditure of ratepayer funds [6].

Current Activities

As part of the DOE SEP demonstration projects, utilities and utility program administrators in California, Wisconsin, the Northwest, and other areas are advancing SEP through their existing continuous energy improvement programs. These utilities are working with their state/regional teams and DOE to pilot SEP in industrial facilities. The utilities are engaging the facilities by providing technical expertise, cost-sharing, and incentives.

Supply Chain

SEP may be useful to major original equipment manufacturers and retailers that are moving their supply chains toward sustainable energy and shifting strategies to reduce energy and other embedded costs. Companies could incorporate SEP as one of the criteria to qualify for

preferred supplier status. SEP is a framework that can be used to ensure a high level of quality in how suppliers manage energy and achieve energy cost reductions. Potentially, facilities that are certified by SEP could receive preferred supplier status with their customers.

CONCLUSION

SEP will provide facilities with an opportunity to improve their energy performance and verify their improvements through an ANSI-ANAB accredited process. The program encourages participation by facilities of all sizes and levels of experience by providing a tiered approach, and it mobilizes resources from states and utilities to assist facilities. The DOE and U.S. CEEM are providing leadership to launch the SEP program. Standards, protocols, and third-party verification will enable companies to achieve energy savings and carbon emission reductions with potential market value that could be recognized both nationally and internationally.

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Paul has worked for DOE since 1988, having developed with U.S. industry a variety of research, development, and technology deployment partnerships and initiatives that all aim to encourage the more rapid adoption of energy efficient industrial technologies. In the 1990s, he managed DOE's voluntary industry partnerships such as Motor Challenge, Steam Challenge, and Compressed Air Challenge, which were then integrated within ITP's current BestPractices initiative.

Previous to DOE, he worked for five years at the Garrett Turbine Engine Company in Phoenix, Arizona, and five years with Westinghouse Electric Corporation in Concordville, Pennsylvania. Both jobs were as a gas turbine development engineer with a specialty of gas turbine combustor design, test, and development.

He has a BS in mechanical engineering from the University of Connecticut and an MS in mechanical engineering from Drexel University.

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Joe holds a BS in electrical engineering from the University of Houston. He has 33 years of experience in the petrochemical industry, with a significant portion in the management of energy systems operations, projects implementation, and energy conservation. He is a recent past chairman of the Texas Industries of the Future Industrial Energy Efficiency Program Advisory Board, a founding and executive committee member of the US Council for Energy Efficient Manufacturing, a member of the US TAG, and a delegate to PCP 242 Energy Management System for development of ISO 50001, and is now an expert on TC 242. In his career with Dow, Joe has also worked and lived in the Middle East and Asia and has extensive experience in facilities operation in those economies.

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APPENDIX A

Appendix A: Sectors Under Consideration For Superior Energy Performance[cm]

Sector	Definition
Industry – Light to Medium	Manufacture of consumer, end-user oriented products using smaller amounts of raw materials and energy. Examples: Clothing, consumer electronics, home appliances, furniture, specialty chemicals, food processing, warehousing, and semiconductors.
Industry – Heavy	Production industries requiring high capitalization and consuming large quantities of raw materials and energy. Examples: Vehicle manufacturers, chemicals, mining, metals production, oil refining, ship building, pulp and paper mills, industrial machinery.
Commercial Buildings	Commercial buildings with business operations that are generally applicable to all commercial buildings. Examples: K-12 schools, restaurants, lodges, stores, small-medium office buildings.
Buildings – Complex Energy Use	Commercial buildings with operations that are highly specialized and require specific domain expertise due to the complexity of energy use. Examples: Health care facilities, educational campuses, research laboratories, data centers.
Transportation	System or means for transporting people or goods. Examples: Ports, trucking services, rail operations, monorail, cruise liners.
Energy Supply	Organizations in the energy market generating, transmitting, or distributing an energy source. Examples: Electric power plants, natural gas drilling operations, gas and oil pipelines, electric distribution companies.