Energy and Carbon Savings:
Insights from Companies Certified to ISO 50001
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ISO 50001 is a business-friendly energy management system standard that provides a global benchmark for climate and clean energy action.

ISO 50001—A Proven Climate Strategy

Countries and companies are looking for strategies to reduce energy and carbon emissions. A strategic approach to energy management has demonstrated value. Energy efficiency is the least expensive, most quickly deployable, and cleanest of all energy resources.

Leading businesses around the world are achieving their energy and carbon reduction goals using the global ISO 50001 standard for energy management systems. These early adopters are proving the business value of ISO 50001 and paving the way for its broad implementation.

ISO 50001 is a framework to help companies continually improve their energy performance and reduce emissions.

Regardless of a company’s size or sector, this framework helps shape policy for efficient energy use, set targets to drive progress, and facilitate data-based decisions about energy use to reduce costs year after year. ISO 50001 is a product of international collaboration—drawing on best practices from over 50 countries and demonstrating impressive savings among the 12,000 early adopters.
This booklet highlights first-hand business experiences, insights, and benefits resulting from use of ISO 50001 around the world.

The Clean Energy Ministerial’s Energy Management Working Group (EMWG) has been driving the global dialogue on quality ISO 50001 implementation since 2010.

To showcase and share energy management successes and best practices of early adopters, the EMWG launched the Energy Management Leadership Awards program.

To qualify for these awards, organizations with ISO 50001 certification prepared case studies to share a high-quality and replicable description of their ISO 50001 implementation, resulting business benefits, and useful advice on lessons learned and keys to success. An independent panel of international experts selected the winners.

Thirty-five businesses in 20 countries have been selected for global recognition. Three companies earned top honors, the Award of Excellence in Energy Management: Cummins Inc. (USA), LG Chem Ltd. (Republic of Korea), and New Gold Inc. (Canada). Another 32 companies received Energy Management Insight Awards for helping to build global insight on the benefits of energy management systems in industrial and commercial facilities.

**Clean Energy Ministerial**
The Clean Energy Ministerial (CEM) is a high-level international forum that promotes policies and programs to advance clean energy.

Through the CEM’s EMWG, government officials worldwide share best practices and leverage their collective expertise to accelerate the use of EnMS in industry and commercial buildings.

Governments participating in the EMWG include Australia, Canada, Chile, China, the European Commission, Finland, Germany, India, Indonesia, Japan, Mexico, the Republic of Korea, Saudi Arabia, South Africa, Sweden, and the United States. The EMWG was launched in 2010 by the CEM and International Partnership for Energy Efficiency Cooperation.

For full details, the award-winning case studies are available online: [www.cleanenergyministerial.org/energymanagement](http://www.cleanenergyministerial.org/energymanagement)
Award of Excellence in Energy Management

Cummins Inc.
India: Jamshedpur, Jharkhand
United Kingdom: Stamford, Lincolnshire;
Huddersfield, West Yorkshire; Darlington County,
Durham; Northamptonshire, East Midlands
United States of America: Columbus, Indiana (2 sites);
Whitakers, North Carolina; Lakewood, New York

LG Chem, Ltd.
Republic of Korea: Cheongju, Chungcheongbuk

New Gold Inc.
Canada: Kamloops, British Columbia

CEM Energy Management Insight Award

3M Company
Canada: Brockville, Ontario; London, Ontario; Perth,
Ontario; Perth 302, Ontario
France: Tilloy-lez-Cambrai, Nord
Germany: Kempten, Bavaria; Neuss, North-Rhine
Westphalia; Hilden, North-Rhine Westphalia; Juchen,
North-Rhine Westphalia; Kamen, North-Rhine
Westphalia; Seefeld/Landsberg, Bavaria; Obernburg,
Bavaria; Wuppertal, North-Rhine Westphalia
Poland: (two plants) Wroclaw, Silesia
Republic of Korea: Naju-si, Jeollanam-do
Taiwan: Tainan City
United States of America: Cordova, Illinois

3M Korea Ltd.
Republic of Korea: Naju, Jeollanam

Abbott Diagnostics Division Sligo
Ireland: Sligo, Connacht

Abbvie Ireland NL BV
Ireland: Sligo, Connacht

Aberdare Cables
South Africa: Port Elizabeth, Eastern Cape Province

Catalyst Paper
Canada: Crofton, British Columbia

Central Termoelectrica Genelba
Argentina: Marcos Paz, Buenos Aires

Curtiss-Wright Electro-Mechanical Corporation
United States of America: Cheswick, Pennsylvania

Dairygold Food Ingredients (DFI)
Ireland: Mitchelstown, County Cork

Detroit Diesel
United States of America: Detroit, Michigan

F-TECH INC
Japan: Kameyama, Mie

HARBEC, Inc.
United States of America: Ontario, New York

Hitachi, Ltd. Infrastructure Systems Company Omika
Works
Japan: Hitachi-shi, Ibaraki

JK Lakshmi Cement Limited
India: Jaykaypuram, Rajasthan

Map Ta Phut Olefins Company Limited
Thailand: Map Ta Phut, Rayong

Mutua Madrileña Automovilista
Spain: 14 buildings in Madrid

Nissan North America, Inc.
United States of America: Smyrna, Tennessee

PT Indah Kiat Pulp & Paper
Indonesia: Tangerang Selatan, Banten

PT. AMERITA INDAH OTSUKA
Indonesia: Cicurug, Sukabumi; Kejayan, Pasuruan

PT. APAC INTI CORPORA
Indonesia: Semarang, Central Java

PT. KMK Global Sports
Indonesia: Cikupa, Banten Province

PT. Nippon Shokubai Indonesia
Indonesia: Ciwandan, Banten

PT. Pertamina Hulu Energi Offshore North West Java
Indonesia: Jakarta

Raymond Limited
India: Chhindwara, Madhya Pradesh

Raymond Limited
India: Jalgaon, Maharashtra

Saint-Gobain Construction Products Gyproc Cape
Town Factory
South Africa: Cape Town, Western Cape

Schneider Electric
Canada: Victoria, British Columbia; McLaughlin,
Ontario
Mexico: Acuamanala, Tlaxcala; Iztapalapa, Distrito
Federal; Monterrey (Plant 2), Nuevo Leon;
Monterrey (Plant 3), Nuevo Leon; Tijuana, Baja
California
United States of America: Lexington, Kentucky; Oxford,
Ohio; Seneca, South Carolina; Columbia, South
Carolina; Smyrna, Tennessee; Clovis, California; Costa
Mesa, California; Lincoln, Nebraska; West Kingston,
Rhode Island; Columbia, Missouri; Cedar Rapids,
Iowa; Peru, Indiana; Portland, Oregon

Scott Safety and Tyco Projects Australia
Australia: Sydney, New South Wales

Shree Cement Ltd.
India: Beawar, Rajasthan

Sidi Kerir Petrochemicals Company (SIDPEC)
Egypt: Alexandria

TNT Chile Limitada
Chile: San Bernardo, Santiago

Vedanta Ltd.
India: Jharsuguda, Odisha
Three companies earned top honors, the CEM Award of Excellence in Energy Management:

**Cummins, Inc.**  
*9 sites across India, the United Kingdom, and the United States of America*  
Cummins designs, manufactures, sells, and services diesel engines and related technology around the world. Establishing an energy management system through a corporate enterprise approach has helped the company exceed savings goals in cost, energy, and carbon emissions.

**LG Chem, Ltd.**  
*Ochang Plant*  
LG Chem is the biggest manufacturer of large-sized polarizers in the world market and makes many kinds of batteries, including Lithium-Ion batteries. LG Chem’s Ochang plant is certified to ISO 50001, helping the company to meet domestic and international energy and greenhouse gas targets, including the Korean government’s goal to reduce national carbon emissions 30% by 2020.

**New Gold Inc.**  
*New Afton Mine*  
New Afton is the first mine in North America to implement ISO 50001. With lower gold and copper prices over the past few years, improved energy performance is one of the few areas that can improve profitability. ISO 50001 also aligns well with energy and greenhouse gas emissions protocols, allowing the mine to focus on ISO 50001 as a means to comply with several programs at the same time.
Cummins, Inc.

Nine sites certified to ISO 50001
US$3.5 million annual savings
1-year payback

*India
• Jamshedpur, Jharkhand

*United Kingdom
• Huddersfield, West Yorkshire
• Daventy, Northamptonshire
• Darlington County, Durham
• Stamford, Lincolnshire

*United States of America
• Columbus, IN laboratory
• Columbus, IN Technical Ctr.*
• Lakewood, NY
• Whitakers, NC*

* Also certified to Superior Energy Performance

Rolling out ISO 50001 at nine sites helped us exceed our goals. Establishing clear procedures, roles, and responsibilities at corporate, business unit, and site levels helps facilitate implementation.
At LG Chem Ochang, switching the focus from operational improvements to energy management helped double annual energy cost savings (5% to 10%).

LG Chem, Ltd.

Ochang plant: Certified to ISO 50001 and Korea Superior Energy Performance

$9 million in savings
4.3-month payback (2014)
Energy is our second greatest expense, amounting to 13% of operational costs, so even a 1% improvement in energy performance is worth hundreds of thousands of dollars.

The mine used an energy management system to drive down energy use and improved its energy performance by 11.4%.

**New Gold Inc.**

New Afton Mine: ISO 50001 certified
- CAD$643,000 savings, 1.1-year payback (2014)
- CAD$444,000 savings, 0.6-year payback (2015)
32 companies received an Energy Management Insight Award for helping to build global insight on the benefits of energy management systems in industrial and commercial facilities.

ISO 50001 is applicable to businesses and organizations of all sizes and sectors, as evidenced by the broad range of award recipients, with ISO 50001 certified sites in the commercial buildings sector (insurance and property management) and industry sectors (e.g., aluminum, automotive, cement, chemicals, food and beverage, oil and gas, petrochemical, pharmaceuticals, plastics, power generation, pulp and paper, textiles, and traffic control equipment, etc.).
3M facilities implementing ISO 50001 and Superior Energy Performance have pushed energy efficiency improvements 60% above company average.

**3M Company**

18 facilities in 7 countries: ISO 50001 certified
US$8 million annual savings
Less than 1-year payback

**Canada**
- Brockville Tape Plant, Ontario*
- London, Ontario
- Perth Scotch-Brite Plant, Ontario
- Perth Tape Plant, Ontario

**France**
- Tilloy-lez-Cambrai

**Germany**
- Hilden
- Jüchen
- Kamen
- Kempten
- Neuss
- Obernburg
- Seefeld/Landsberg
- Wuppertal

**Poland**
- Wroclaw AD
- Wroclaw PSD

**Republic of Korea**
- Naju-si**

**Taiwan**
- Tainan City

**United States**
- Cordova, IL*

* Also certified to Superior Energy Performance
** Also certified to Korea Superior Energy Performance
Third-party verification validates the energy team’s estimated energy savings and helps sell management on future energy projects.

3M Korea Ltd.

Naju plant: ISO 50001 and Korea Superior Energy Performance certified
$210,000 annual savings
13-month payback
At Abbott Diagnostics, the entire cost of certification to ISO 50001 was simply the verification audit; there was no additional cost involved in implementing the EnMS.

Abbott Diagnostics Division

Sligo facility: ISO 50001 certified
€1.4 million savings
Less than 1-year payback
AbbVie uses its energy management system to also manage its water and nitrogen usage.

AbbVie Ireland NL BV

Sligo facility: ISO 50001 certified
€800,000 annual savings
Less than 1-year payback
Recognizing that tax and legislative restrictions on energy use are on the horizon, Aberdare Cables proactively earned ISO 50001 to highlight its commitment. The company’s remaining South African facilities will be certified by the end of the year.

Aberdare Cables
Stanford Road site: ISO 50001 certified
R1.5 million annual savings
5-month payback
Collaboration between industry and government is the surest route to a successful energy management system.

Catalyst Paper
Crofton Division: ISO 50001 certified
CAD$3,264,000 savings
Less than 1-year payback
C.T. Genelba’s certification to the global ISO 50001 standard for energy management systems encouraged other facilities in the company to develop energy policies and one has also earned the certification.

Central Termoeléctrica Genelba

Marcos Paz, Buenos Aires facility: ISO 50001 certified
$136,000 annual savings
3-month payback
The EMD facility had pursued energy efficiency in the past, but ISO 50001 and Superior Energy Performance provided the uniform reporting needed to ensure sustainability and verify energy efficiency improvements.

Curtiss-Wright Electro-Mechanical Corporation

EMD Facility: ISO 50001 and Superior Energy Performance certified
US$60,000 annual savings
1 year and 8 month payback
International customers have actively sought to do business with Dairygold because of its commitment to energy efficiency and sustainability—as verified through ISO 50001 certification.

Dairygold Food Ingredients

Clonmel Road and Castlefarm facilities, Mitchelstown: ISO 50001 certified

€407,000 annual savings

1.5-year payback
Integrating ISO 50001 into the existing ISO 14001 system allowed Detroit Diesel to implement its energy management system in just six months.

Detroit Diesel Corporation

Detroit facility: ISO 50001 and Superior Energy Performance certified
US$3.7 million annual savings
2-year payback
F-TECH Inc. used the Kameyama plant’s lessons learned and experience in implementing ISO 50001 to develop a corporate energy management system, which it plans to introduce as the standard for all of its mass production plants.

F-TECH Inc.
Kameyama Plant: ISO 50001 certified
¥7 million annual savings
2-month payback
ISO 50001 and Superior Energy Performance helped this small manufacturer become carbon neutral.

HARBEC Inc.

Ontario, New York facility: ISO 50001 and Superior Energy Performance certified

US$52,000 annual savings

2.4-year payback
ISO 14001 helps to determine energy savings targets, but ISO 50001 connects action and performance measurement to document success.

Hitachi, Ltd. Infrastructure Systems Company

Omika Works plant: ISO 50001 certified

¥ 60 million annual savings
The Jaykaypuram, Sirohi plant proactively earned certification to ISO 50001, exceeding the energy reduction targets mandated by India’s Energy Conservation Act of 2001.

JK Lakshmi Cement Limited

Jaykaypuram, Sirohi plant: ISO 50001 certified
Rs 903 million savings
3 year 2 month payback
Energy is the company’s most significant operating cost, so corporate executives strategically selected the facility using the largest amount of energy in the company to implement ISO 50001 and accelerate progress toward company goals to reduce energy use, greenhouse gas emissions, and costs.

Map Ta Phut Olefins Company Limited

Rayong Province facility: ISO 50001 certified
US$964,000 annual savings
10-month payback
To obtain target energy and cost savings, ISO 50001 radically shifted our approach from large capital investment to more effective management and the adoption of low- to no-cost measures. Our energy management system is also used to manage water, a scarce and precious resource in Spain.

Mutua Madrileña Automovilista

14 buildings in Madrid: ISO 50001 certified
€428,847 savings in 2 years
4-month payback
Some believed the company had already seized all opportunities to save energy, but the energy management system helped unveil correctable, previously undetected energy losses.

**Nissan North America, Inc.**

Smyrna, Tennessee facility: ISO 50001 and Superior Energy Performance certified
US$4.6 million annual savings
Top management clearly communicates the mill’s energy policy both internally and externally, and suppliers are evaluated, in part, on their energy performance.

PT. Indah Kiat Pulp and Paper

Tangerang Mill: ISO 50001 certified
US$1.6 million savings
17-month payback
PT. Amerta Indah Otsuka encourages all of its business partners to review their energy consumption, efficiency, and policies to discover savings opportunities. For example, its Purchasing Orders with external parties recommend use of an energy management system.

PT. Amerta Indah Otsuka

Kejayan and Sukabumi plants: ISO 50001 certified
IDR 3.2 billion annual savings
1.2-year payback
Companies can gain valuable additional expertise, training, and resources by cooperating and collaborating with other organizations, such as UNIDO and ministries of energy and industry.

PT. Apac Inti Corpora

Central Java facility: ISO 50001 certified
US$319,000 annual savings
1.1-year payback
Energy management systems work best when all parties are involved: top management, mid-management, and operators. Ongoing communications at all levels of the company helps build understanding, knowledge, and support.

PT. KMK Global Sports

Cikupa plant: ISO 50001 certified
US$1 million annual savings
2-year payback
While PT. Nippon Shokubai Indonesia’s process systems already used efficient equipment, ISO 50001 helped find energy savings opportunities in the energy distribution system and conversion efficiency.

PT. Nippon Shokubai Indonesia
Banten plant: ISO 50001 certified
Rp. 15 billion savings (2016 est.)
Less than 1-year payback
PT. PHE ONWJ

Five facilities: ISO 50001 certified
US$840,000 annual savings
1.9-year payback

North West Java Sea ISO 50001 Certified Sites
- Mike Mike flow station
- Arco Ardjuna floating storage and offloading facility
- Muara Karang onshore receiving facility
- Tanjung Priok onshore receiving facility
- Cilamaya onshore receiving facility

To counter projected decreases in oil and gas production, PT. PHE ONWJ encourages the use of energy management system to improve energy efficiency.
ISO implementation guides clarify the use of ISO 50001 and its requirements. These guides include ISO 50004 (EnMS implementation guidance), 50006 (energy baseline and energy performance indicators), ISO 50002 (energy audits), and 50003 (EnMS audits).

Raymond Limited

Chhindwara facility: ISO 50001 certified
Rs. 2.6 million annual savings
A company cannot control the cost of raw materials, but it can use an energy management system to reduce energy use and minimize manufacturing costs to obtain an edge in marginally profitable markets.

**Raymond Limited**

Jalgaon facility: ISO 50001 certified
23.2 Lacs annual savings
1-year payback
ISO 50001 provides a systematic approach to improve the energy performance of any business. It is a simple, effective, proven system.

Saint-Gobain Construction Products

Gyproc Cape Town Factory: ISO 50001 certified
R 1.9 million savings (2015)
1-month payback
By adopting an enterprise-wide approach, Schneider Electric has been able to reduce the time required to implement an ISO 50001 energy management system from 18 months to 6 months.

Schneider Electric

20 sites in 3 countries: ISO 50001 certified

Canada
- McLaughlin, Ontario
- Victoria, British Columbia*

Mexico
- Tlaxcala
- Rojo Gomez*
- Monterrey – Plant 2*
- Monterrey – Plant 3*
- Pacifico, Tijuana*

United States of America
- Cedar Rapids, IA*
- Clovis, CA*
- Columbia, SC*
- Columbia, MO*
- Costa Mesa, CA*
- Lexington, KY*
- Lincoln, NE*

- Oxford, OH
- Peru, IN*
- Portland, OR
- Seneca, SC*
- Smyrna, TN*
- West Kingston, RI*

*Also Superior Energy Performance certified
ISO 50001 provides a structured approach to Right First Time methodologies. Ultimately, improved efficiencies, maintenance practices, and cost savings benefit the organization, its shareholders, and customers.

Scott Safety and Tyco Projects

Guildford facility: ISO 50001 certified
AUD$25,000 annual savings
1.5-year payback
Shree Cement Ltd. found that employees could better recall their instruction in energy management when classroom sessions were augmented by innovative training methods like roleplaying, workshops, movies, and case studies.

Shree Cement Ltd.

Ras, Rajasthan facility: ISO 50001 certified
Rs 40.8 Cr savings
3-year payback
SIDPEC knew that it could tackle increasing energy costs and supply insecurity by improving its energy efficiency using the systematic approach provided by ISO 50001.

Sidi Kerir Petrochemicals Co. (SIDPEC)
Alexandria facility: ISO 50001 certified
6.4 million EGP annual savings
3-month payback
The systematic energy management system structure required by the ISO 50001 standard enabled TNT Chile Limitada to align the entire company and all of its employees toward achieving a common target.

TNT Chile Limitada

Nationwide fleet: ISO 50001 certified
US$263,000 annual savings
17-month payback
The ISO 50001 energy management system helped Vedanta Limited reduce its cost of production, reduce its carbon footprint, and meet multiple legal and government requirements in a structured and organized manner.

Vedanta Limited

Smelter plant-1, Jharsuguda: ISO 50001 certified
1635 Lakhs Rupees (INR) savings
2-month payback
Participating Companies, by Sector

Acrylic Film and Battery Manufacturing
- LG Chem, Ltd.

Aluminum Manufacturing
- Vedanta Limited

Automotive & Parts Manufacturing
- Cummins, Inc.
- Detroit Diesel Corporation
- F-TECH Inc.
- Nissan North America, Inc.

Cement Manufacturing
- JK Lakshmi Cement Limited
- Shree Cement Ltd.

Chemicals Manufacturing
- 3M Korea Ltd., Naju plant
- Map Ta Phut Olefins Company Limited
- PT. Nippon Shokubai Indonesia, Banten plant
- Sidi Kerir Petrochemicals Co.

Commercial and Defense Nuclear Manufacturing
- Curtiss-Wright Electro-Mechanical Corporation

Electric Power Generation
- Central Termoeléctrica Genelba

Electrical Equipment Manufacturing
- Aberdare Cables
- Hitachi, Ltd. Infrastructure Systems Company

Energy and Energy Management Products and Services
- Schneider Electric

Food and Beverage Manufacturing
- Dairygold Food Ingredients
- PT. Amerta Indah Otsuka

Footwear Manufacturing
- PT. KMK Global Sports

Freight Transportation
- TNT Chile Limitada

Healthcare (Diagnostics) Manufacturing
- Abbott Diagnostics

Insurance and Property Management
- Mutua Madrileña Automovilista

Manufacturing (General)
- 3M Company

Mining
- New Gold, Inc.

Nonmetallic Mineral Product Manufacturing
- Saint-Gobain Construction Products

Oil and Gas Production
- PT. PHE ONWJ

Pharmaceuticals Manufacturing
- AbbVie Ireland NL BV

Plastics Manufacturing
- HARBEC Inc.

Pulp and Paper Manufacturing
- Catalyst Paper
- PT. Indah Kiat Pulp and Paper

Safety Equipment Manufacturing
- Scott Safety and Tyco Projects

Textiles Manufacturing
- PT. Apac Inti Corpora
- Raymond Limited, Chhindwara
- Raymond Limited, Jalgaon
### Participating Companies, by Country

<table>
<thead>
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<th>Country</th>
<th>Companies</th>
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<td>Central Termoeléctrica Genelba, Marcos Paz, Buenos Aires</td>
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*Indicates sites included in a company’s global or broader regional submission*
www.cleanenergyministerial.org/energymanagement