CLEAN ENERGY MINISTERIAL

Accelerating the Transition to Clean Energy Technologies

LARGE-SCALE ADOPTION OF ENERGY MANAGEMENT SYSTEMS

Pre-Read for Public-Private Roundtable

Clean Energy Ministerial
16:15-17:45
17 April 2013
Taj Palace
New Delhi, India

OUTLINE

1. Objective
2. Current landscape of industrial energy efficiency
3. Government energy management programmes
4. Role of industry, energy service providers and financial institutions
5. Opportunities for progress

OBJECTIVE

- Identify a set of smart policies and regulatory mechanisms to mobilise energy efficiency at a large-scale and accelerate corporate adoption of energy management systems (EnMS), including those that can be carried forth through public-private collaboration within the context of the Clean Energy Ministerial

Industries that adopt EnMS may save up to 10-30% of their total energy use.

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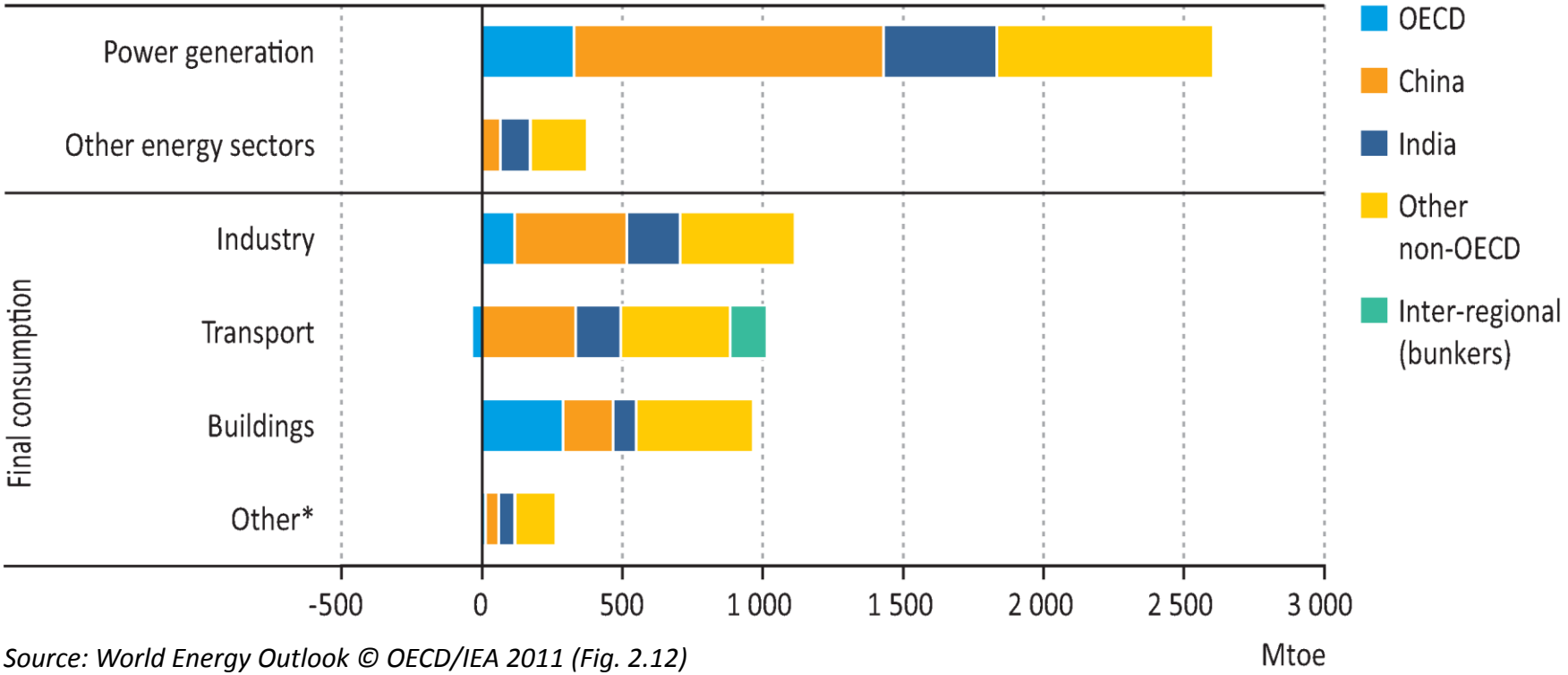
Why is the industry sector important?

New Policies Scenario: Assumes all new policies announced to date are effectively implemented

Incremental energy demand by sector and region in the New Policies Scenario, 2009-2035



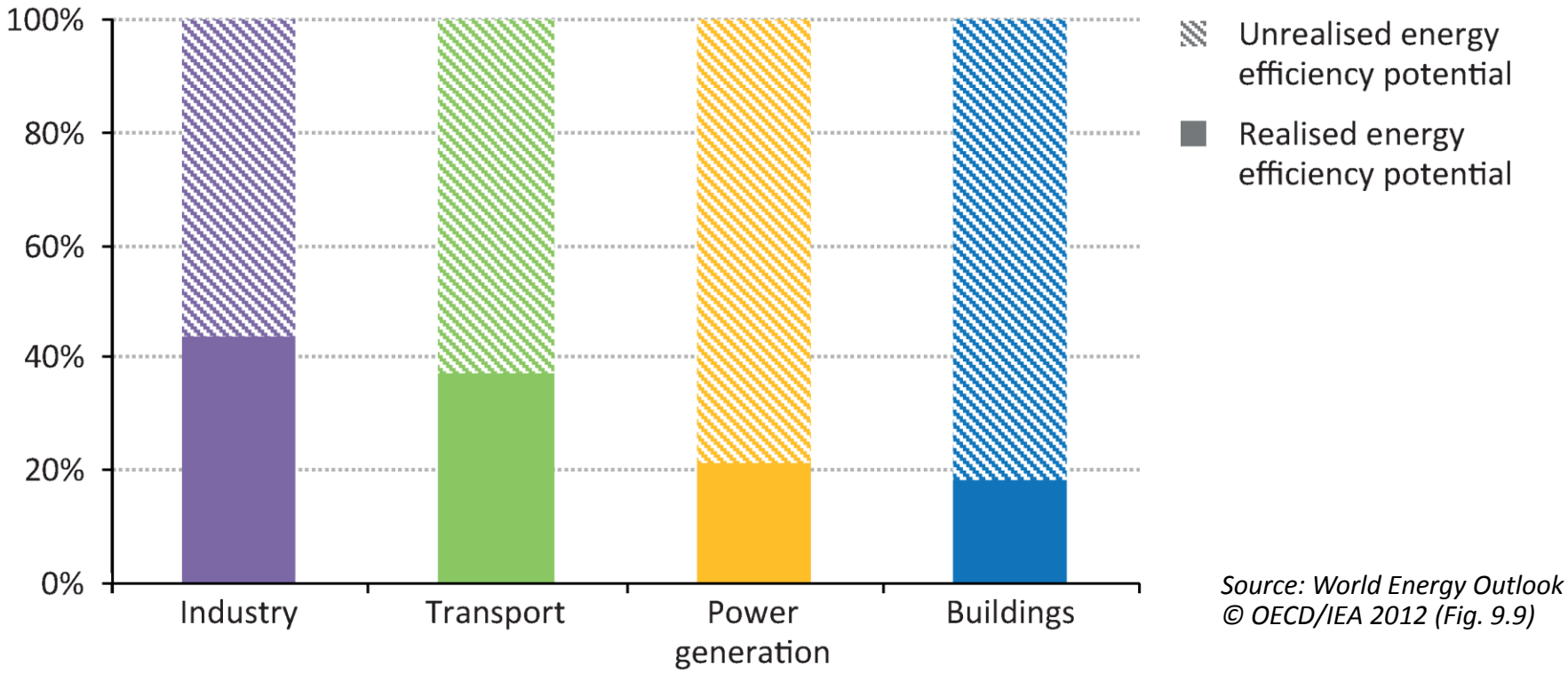
Source: World Energy Outlook © OECD/IEA 2011 (Fig. 2.12)

Final industrial energy demand is projected to grow rapidly (behind power generation) during 2009-2035, particularly in developing countries.

Significant Energy Savings in Industry Still Available

New Policies Scenario: Assumes all new policies announced to date are effectively implemented

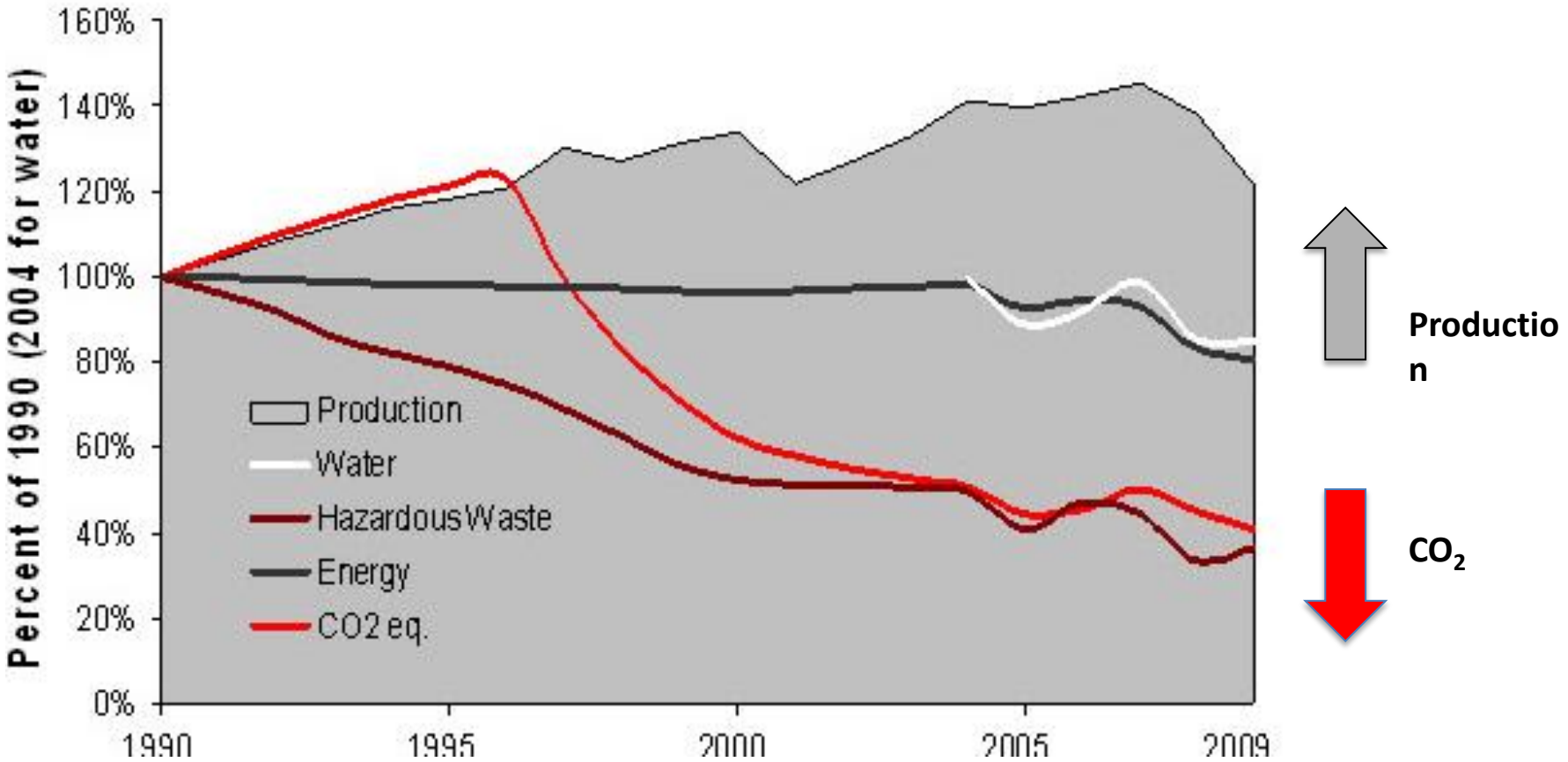
Energy efficiency potential realised by sector in the New Policies Scenario



Source: World Energy Outlook
© OECD/IEA 2012 (Fig. 9.9)

Two-thirds of the economic potential to improve energy efficiency remains untapped in the period to 2035.

Transforming Industry – Gaining Productivity



DuPont Sustainability Management System

is based around senior management leadership, allocates resources intelligently, leverages efforts across business units, improves operational discipline and takes into account sustainability cost benefits when making business decisions.

Benefits of Industrial energy efficiency

Private Sector

- Reduced energy costs
- Increased productivity, resource efficiency and product quality improvements
- Co-benefits often exceed the value of energy savings

National

- Increases in GDP, national competitiveness and job creation
- Increased energy security and system reliability through reduced energy demand

International

- Reduction in GHG emissions

Achieving Energy Efficiency Potential through energy management

What is an Energy Management System (EnMS)?

- A suite of procedures and practices to ensure systematic tracking, analysis and planning of energy use in industry

What does an EnMS System Do?

- Maximises energy savings and improves energy performance continuously through organisation and technology changes at the facility and enterprise level

- Helps companies overcome informational, behavioural and organisational barriers to energy efficiency

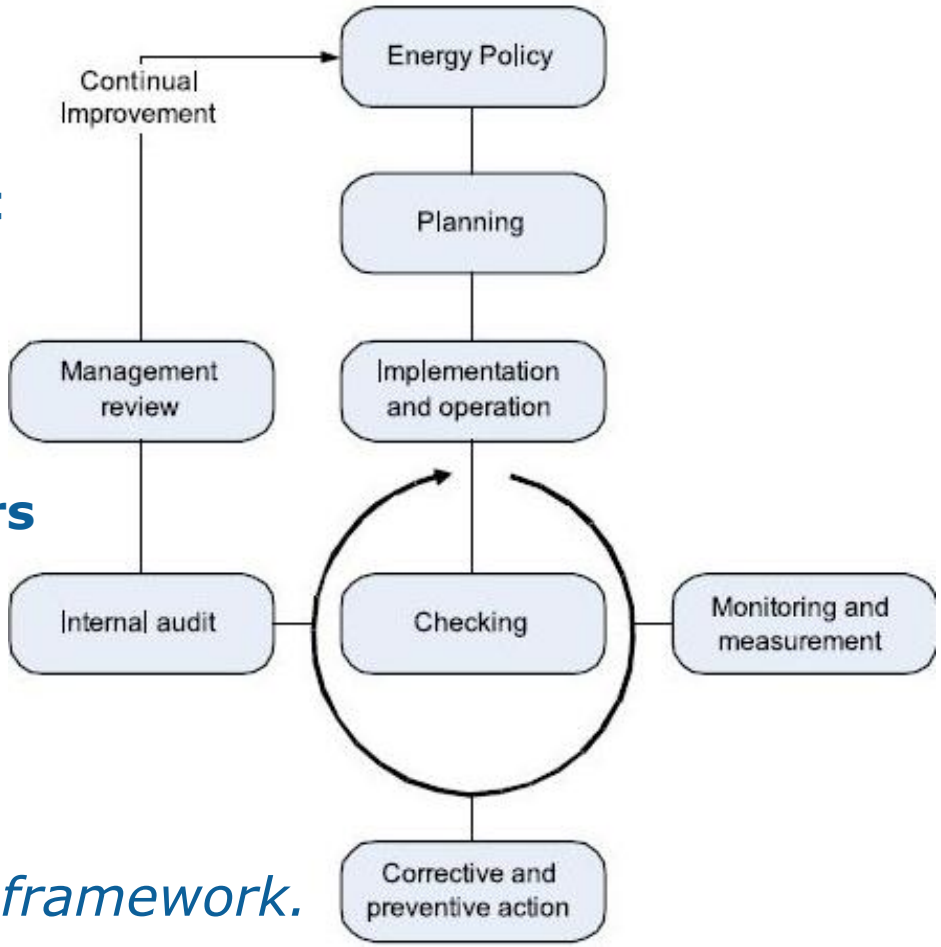
EnMS standards:
defined by standardisation bodies (e.g., ISO 50001)

EnMS specifications:
formulated by a government agency

Key Elements of Energy management Systems

An EnMS includes:

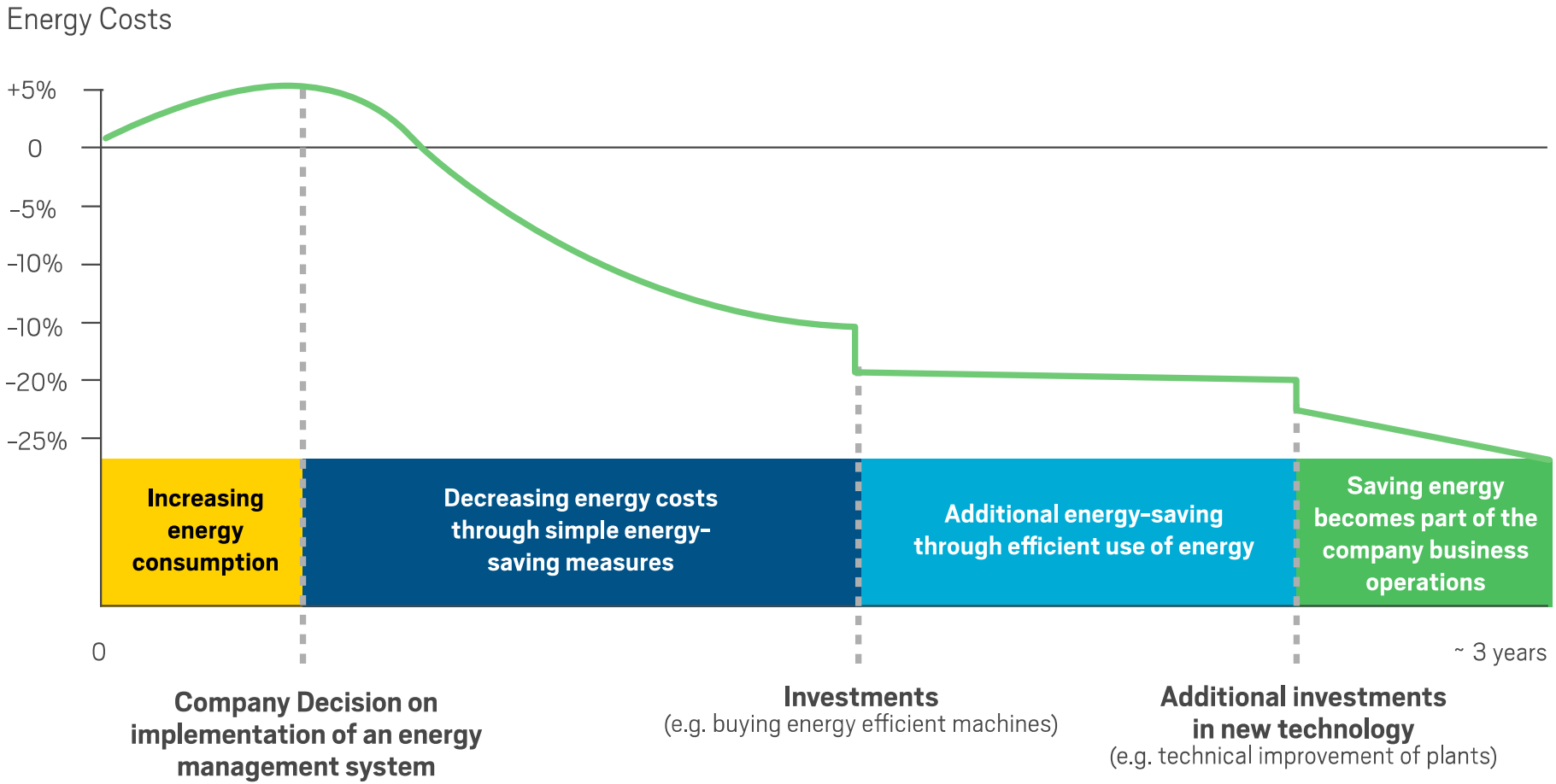
- **Energy policy**
- **Cross-divisional management team**
- A **baseline**
- An **energy review**
- **Energy performance indicators**
- **Action plans**
- **Internal audits**
- **Third party certification**



*...within a **Plan-Do-Check-Act** framework.*

Sources: A. McKane (2011), Superior Energy Performance (2011), ISO (2011).

Continuous Cost Reduction with Energy Management



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Source: Adapted from Kahlenborn et al., (2012)

Energy Management System Results

- Industries that adopt EnMS may **save up to 10-30%** of their total energy use.
- Companies including Dow Chemical, United Technologies Corporation, 3M, St Marys Cement and Toyota have achieved major energy-intensity improvement using EnMS.

3M Brockville Plant, Canada

- Began ISO 50001 implementation in 2011 within GSEP pilot
- Improved energy intensity by 15.2% over three years
- Reduced energy use from compressed air system by 12%
- Reduced energy costs by 30% per unit of product ($/m2)

The ISO 50001 Standard

- Adopting the international ISO 50001 standard for EnMS provides companies with an internationally recognised response to sustainability and energy efficiency issues.

- Published June 2011
- 1530 industrial sites certified worldwide

  Source: so-called "Peglau Statistics"
  Status: 02.2013

Strategies to Enable Large Scale Adoption of Energy Management

Implementation of energy efficiency measures can be slow to materialise and industries often need to be supported by programmes or incentives to fully realise energy efficiency potential.

Two Key Strategies to Mobilise Adoption

1. **GOVERNMENT-LED ENERGY MANAGEMENT PROGRAMMES (EnMPs)**
   which mandate or encourage companies to implement EnMS and invest in identified energy savings

2. **THIRD PARTY INITIATIVES**
   which drive the uptake of EnMS in industry and stimulate industry decision makers to take action

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Strategy Option (1): Government EnMPs

- Governments around the world are now promoting EnMS as a viable means of reducing energy consumption. Some governments have mandated corporate adoption, while others are encouraging voluntary uptake by providing financial incentives or awards.

Examples of government programmes (more on next slide)

- Korea (mandatory): GHG and Energy Target Management scheme. ISO 50001 plays a key role in this programme. Certification pilots are underway.
- Ireland (voluntary): Energy Agreements program. ISO 50001 is required in exchange for extensive technical support.

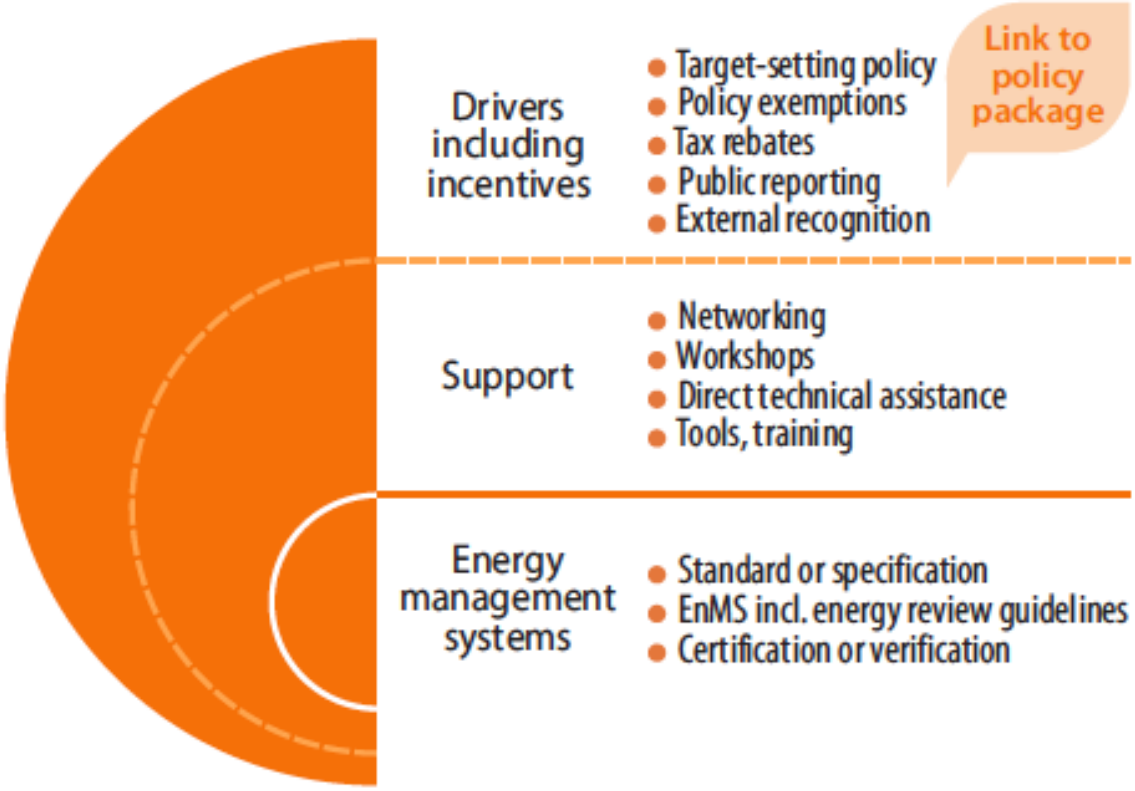
Examples of Government Programmes that Promote EnMS

Country	Program Name	EnMS type	Voluntary Mandatory	Certification	Drivers
Australia	Energy Efficiency Opportunities	EEO Assessment Framework	M	No	Public reporting of EE opportunities
China	Top 10,000 Enterprise Program	GB 23331	M	Voluntary	Mandatory
Denmark	Agreement on Industrial Energy Efficiency (DAIEE)	ISO 50001	V	Yes	Tax rebate
Ireland	Energy Agreements Program	ISO 50001	V	Yes	Extensive technical support
South Korea	GHG and Energy Target Management scheme	ISO 50001	M	Yes	Mandatory
Sweden	Energy Efficiency in Energy Intensive Industries (PFE)	ISO 50001	V	Yes	Tax rebate
USA	Superior Energy Performance	ISO 50001	V	Voluntary	Awards, possible tax rebate

Government Energy Management Programs

EnMS itself is not sufficient to deliver savings: implementation support and drivers are needed

- Policies, drivers and incentives and implementation support are needed
- Tying to energy performance improvements is key



Source: Reinaud, Goldberg and Rozite, 2012.

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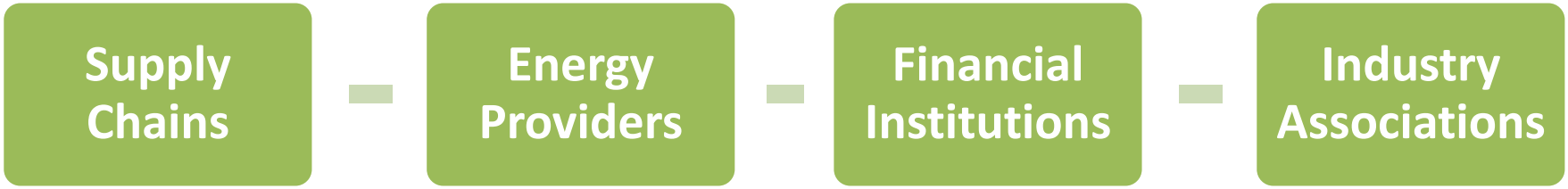
STRATEGY OPTION (2): ALTERNATE AND COMPLEMENTARY CHANNELS TO DELIVER CORPORATE ADOPTION OF ENMS

Third Parties can also drive the uptake of EnMS in industry



- Energy providers, multinational companies and multilateral and commercial banks around the world have started to initiate large-scale energy efficiency programmes that have EnMS at their heart.

Alternate Delivery Channels for EnMS Adoption

Delivery Models	Drivers for Players to Develop EnMS Programs (examples)	Drivers for EnMS Adoption by Companies
Supply Chains (large corporations)	• Enhance company's reputation • EnMS can be used by all industrial players, large and small • Government support: allowing companies to meet their EE obligations by engaging their value chain	• Buying power of the large company • Cost savings • Possible implementation support
Utilities/Energy Providers (utility or third parties)	• Improve the utility's customer relations • Strategy to improve reliability and availability of power supply at a lower cost than supply resources • Regulatory requirements for energy efficiency	• Sustainable source of financing • Technical assistance
Financial Institutions	• Increase number of deals and project finance • Help assess the risks and returns of EE projects • Reduce investment risk • Improve and enhance customer relations	• Lower loan transaction costs • Blending technical assistance with financial products
Industry associations	• Provide valuable service to member companies	• Sharing of information • Implementation support

Energy Management Systems in Supply Chains

- Supply Chain Initiatives (SCIs) by corporations focusing on EnMS have potential to continuously deliver cost savings and increase efficiencies across company value chains on a large-scale and across a broad business base.

ISO 50001 is useful for companies seeking an internationally recognised tool in corporate and supply chain sustainability programmes

Examples

- SKF requires all its energy intensive suppliers have ISO 50001 by 2016.
- HP is requiring suppliers in China and Taiwan to implement EnMS.
- Governments (Japan, Netherlands) allow larger companies to count action in the supply chain toward their energy targets/obligations.
- Financial institutions, like IFC, now offer specialised financial services for energy efficiency projects in suppliers of large brands.

EnMS in Energy Efficiency Obligations (EEO) - Utility Programmes

- Utility/EEO programmes encourage utilities or third parties (e.g. ESCOs) to deliver energy savings in customers' premises.
- Traditionally focused on residential sector and technical options, these programmes are now targeting industry offering EnMS training, implementation and financial incentives.

Energy Trust of Oregon (ETO)

- A non-profit corporation, ETO facilitates EnMS implementation by utility customers. ETO offers technical support and incentives for customised project solutions and technologies.
- Services and projects paid principally through systems-benefit charges.

Utility Programme Example in the US: Incentives based on EnMS performance

Milestones Achieved	Certification Path Incentives (required for enterprises >2,000 MWh/yr)
Energy Action Plan approved	$7,500
Certification readiness Report issued	$7,500
ISO 50001 certification received	$7,500
Superior Energy Performance certification	$7,500

Source: Klaus Carl, (2012)

EnMS and Financial Institutions

- Financial institutions are initiating models that blend financing with technical assistance and EnMS capacity building.
- For example, EBRD has developed internal technical capacity to promote and provide assistance on EnMS to its customers, and make EE assessments as part of its standard loan evaluation process.

GEF-funded Program: EE Market Transformation in Russia 2010-15

- EBRD and UNIDO joint program builds capacity of the government to develop effective industrial energy efficiency policies, and of industry to engage in energy management and identify energy efficiency projects.
- EBRD provides technical assistance and capacity building to industry CFOs to develop bankable EE projects according to EnMS.
- EBRD builds capacity of local lenders, including financial intermediaries, ESCOs, to access risks and returns of EE projects.

EnMS and Industry Associations

Industry associations:

- Introduce voluntary EnMS programs with their members.
- Coordinate network of companies to share best practices.

Food processing industry – U.S. Pacific Northwest

- The Northwest Food Processors Association (NWFPA), government and Northwest Energy Efficiency Alliance (NEEA) built a partnership to leverage enterprise participation in a voluntary EnMS program.
- The partnership set a voluntary 25% energy intensity reduction target for their sector.
- NWFPA serves as the intermediary between companies and government and coordinates sharing of best practices and information on benchmarks.
- EnMS implementation is linked with utility incentives.
- Third parties help implement EnMS in companies and provide training.

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Opportunities for Progress

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Opportunities for Progress (1): Enhancing Government Energy Management Programmes

- Governments play an important role in establishing support structures to promote uptake of EnMS and need to be tailored to third party as well as industry needs.
- In the development of EnMPs, consultation with industry and third parties is key.

Examples of incentives and support structures

- EnMS implementation guidelines
- Technology catalogues
- Public sector guarantees for financing EE in SMEs
- Training and capacity building of third parties

Opportunities for Progress (2): Encouraging Public-Private Cooperation

- Non-government actors, such as energy providers, industry associations and large corporations have the potential to drive widespread uptake.

Examples of public-private EnMPs

- Governments encourage utilities or third parties to drive EnMS implementation within the utility's program offerings.
- Governments, such as the Netherlands and Japan, recognise the efforts of lead companies that take energy efficiency action in their supply chains.
- Denmark and Italy have allocated bilateral funds to financial institutions for EnMS training in industry.

Opportunities for Progress (3): Building International Collaboration

There is significant work at the international level focusing on EnMS adoption. For example:

Global Superior Energy Performance (GSEP)	• Promotes government cooperation to advance EnMS in industry and commercial buildings through the Clean Energy Ministerial
Energy Management Working Group (EMAK)	• Builds a network of policy makers and industry practitioners to promote energy management in industry
Institute for Industrial Productivity (IIP)	• Supports EnMS adoption on the ground in India, China and the United States and compiles and develops global best practice information
United Nations Industrial Development Programme (UNIDO)	• Provides capacity building and policy advisory assistance to promote resource-efficient and low-carbon industrial production, including on EnMS

Opportunities for Progress (3): Building International Collaboration

There are opportunities to improve coordination at the international level