UNIDO's worldwide advances achieved in promoting energy management

Marco Matteini
Industrial Development Officer
Department of Energy

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Abrinstal YouTube Channel

Content

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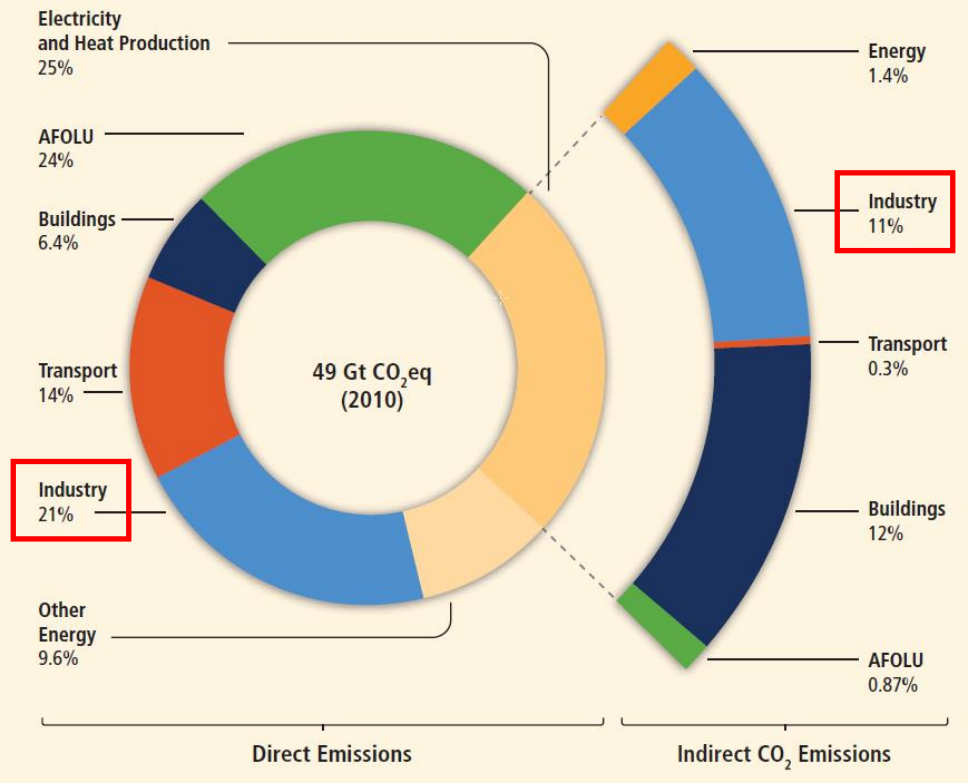
2. The value of energy management systems and ISO 50001
3. Promoting energy management and ISO 50001
4. Energy management and ISO 50001 in Oil and Gas

1. Some context information

Some context for Industry

Greenhouse Gas Emissions by Economic Sectors

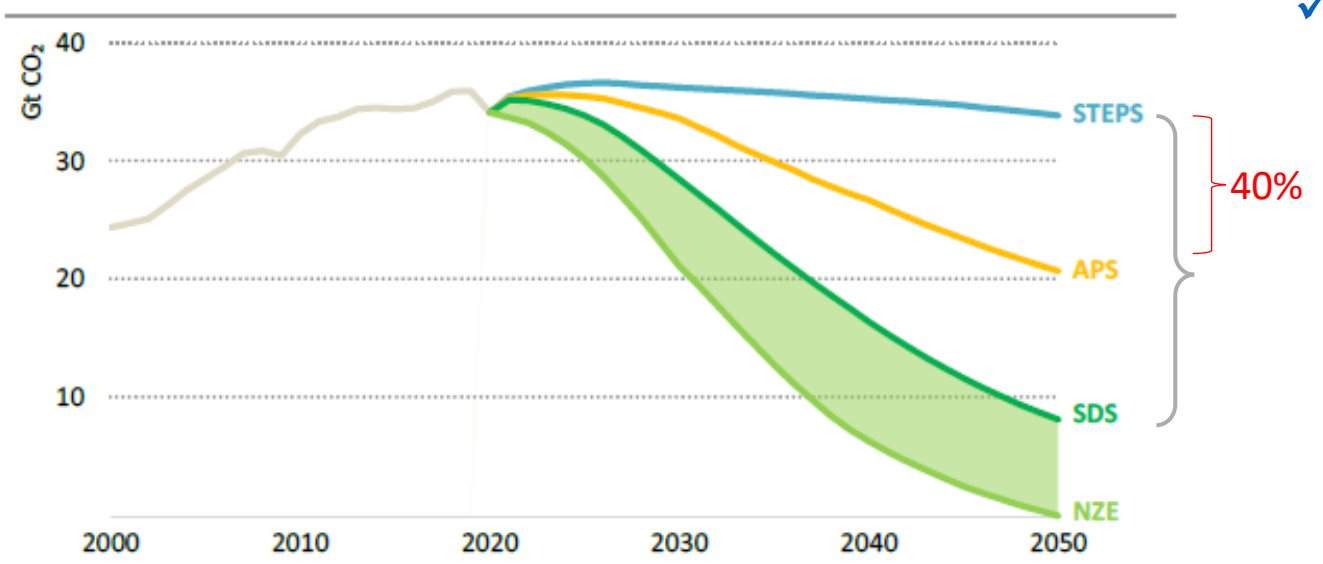


Source: IPCC Working Group III – Mitigation of CC, 2014

- ✓ Industry energy consumption represents almost 40% of current global total final consumption and is still dominated by fossil fuels, in particular coal (*Source: IEA WEO 2021*)
- ✓ Industry is the single largest source of direct & indirect GHG emissions, accounting for about 32% of global emissions (*Source: IPCC WG III, 2014*)
- ✓ Industry production is projected to increase by 10 to 30% by 2030 depending on the sub-sector sectors, and almost all this growth will occur in emerging markets and developing economies (*Source: IEA WEO 2021*)

Some context for Energy Efficiency

Figure 1.4 ▷ CO_2 emissions in the *WEO-2021* scenarios over time



The APS pushes emissions down, but not until after 2030; the SDS goes further and faster to be aligned with the Paris Agreement; the NZE delivers net zero emissions by 2050

Note: APS = Announced Pledges Scenario; SDS = Sustainable Development Scenario; NZE = Net Zero Emissions by 2050 Scenario ; STEPS = Stated Policies Scenario

Source: IEA World Energy Outlook 2021

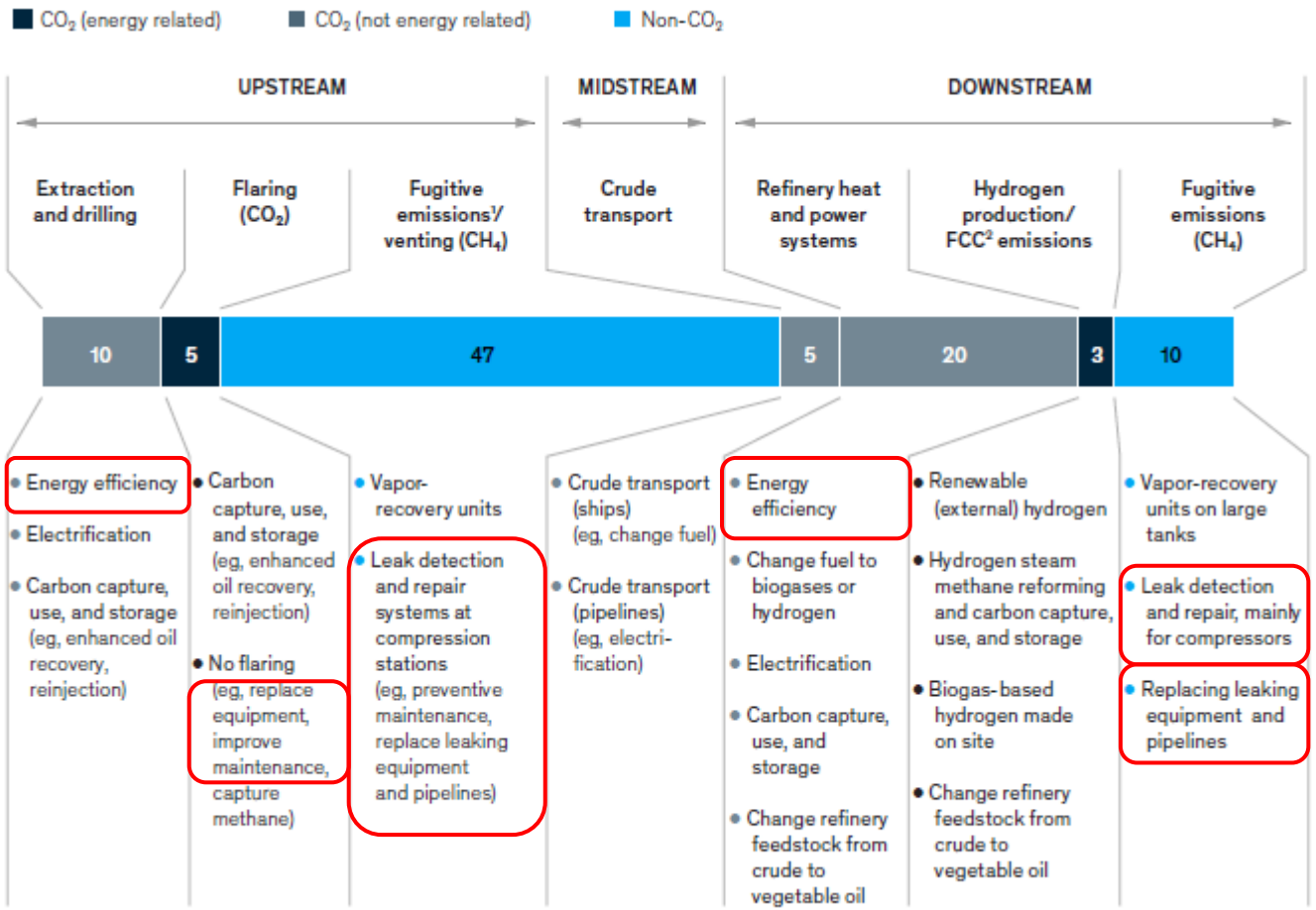
✓ Energy-efficient technologies and services contribute to about 40% of cumulative emissions reductions to 2070 in the Sustainable Development Scenario relative to the Stated Policies Scenario

- efficiency improvements and refurbishments to further enhance technology or process efficiency
- shifting towards low-carbon electric, renewable, or hydrogen end-use equipment that are more efficient than existing products.
- avoided demand through material efficiency, public transportation, and active controls also contributes.

(*Source: IEA 2020 Energy Technologies Perspectives*)

Some context for Oil and Gas Sector

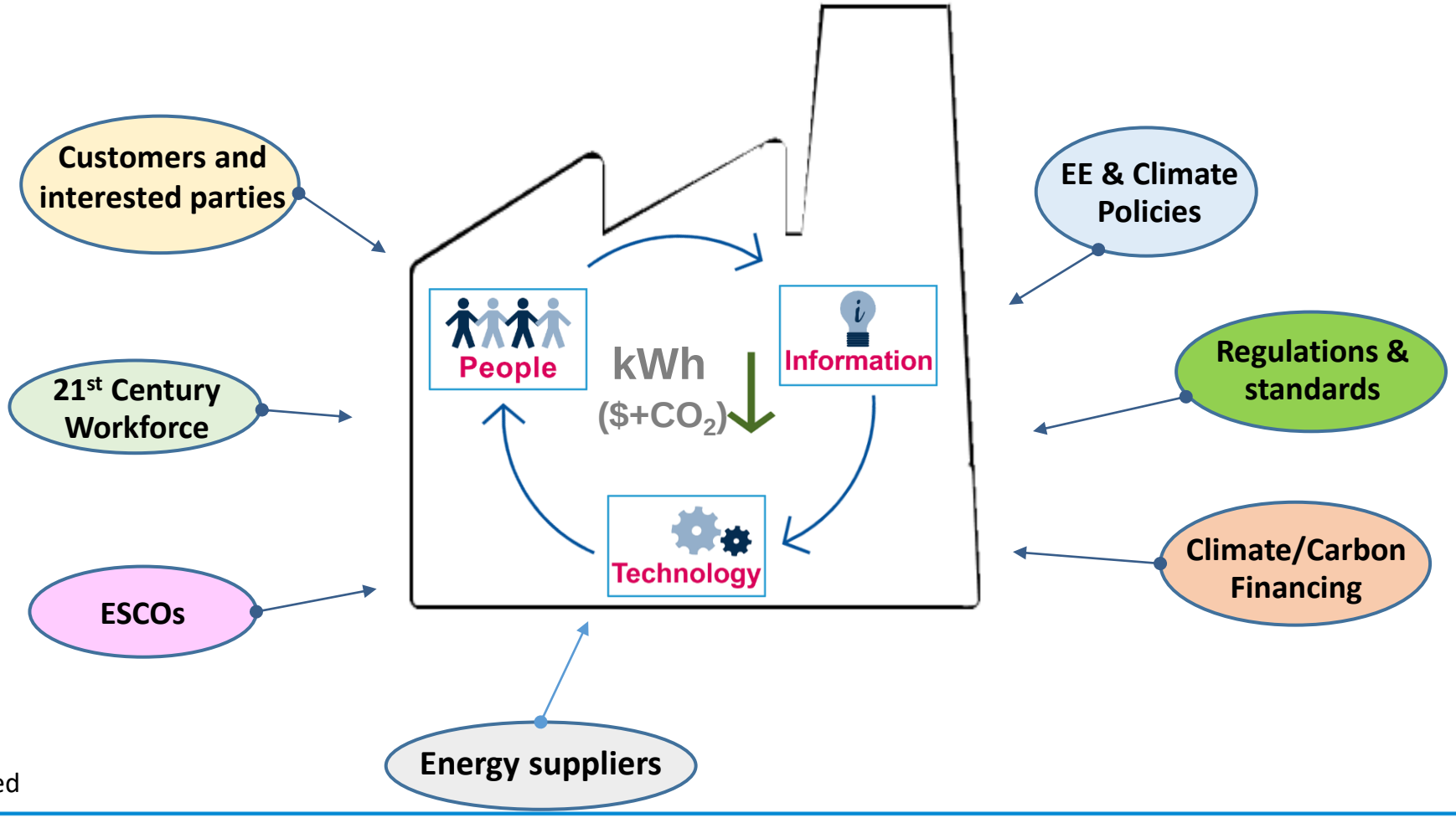
- ✓ Oil & Gas industry's operations (Scope 1) account for 8% of all human-made greenhouse-gas (GHG) emissions. In addition, it produces the fuels that create another 34% of global emissions *(Source: McKinsey & company, Jan 2020)*
- ✓ Currently available technologies can address most of the oil and gas industry's emissions *(Source: McKinsey & company, Jan 2020)*



(Source: The future is now: How oil and gas companies can decarbonize, McKinsey & Company, Jan 2020)

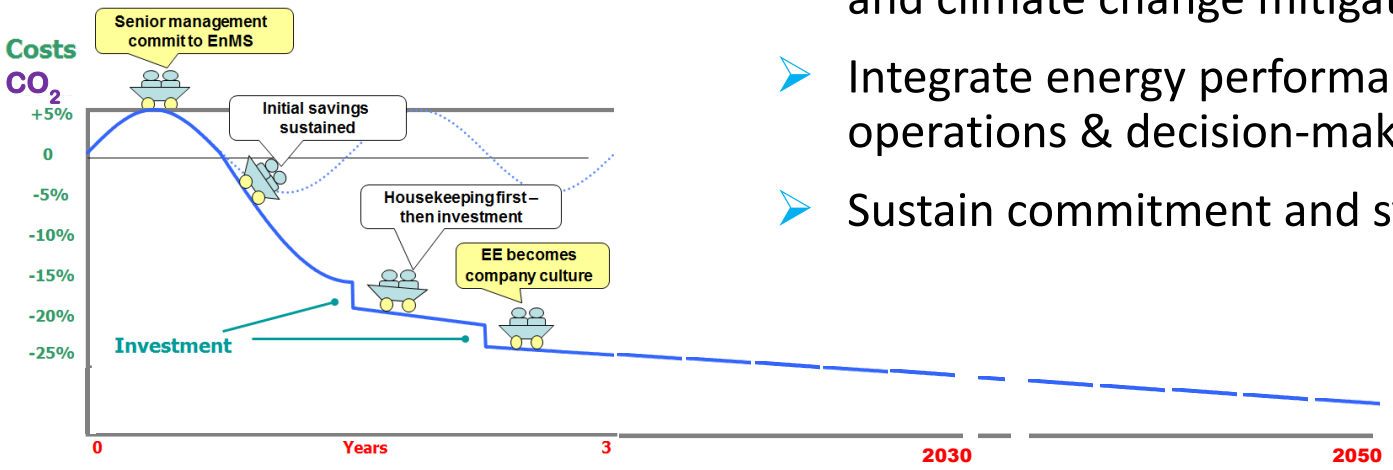
2. The value of energy management systems and ISO 50001

The value of energy management systems and ISO 50001



The value of energy management systems and ISO 50001 – cont.

- Manage complexity and drive transformation for continual improvement of energy performance and carbon net-zero
- Ensure assets optimization and energy cost/emission reductions
- De-risk energy investments and maximize returns



- Demonstrate leadership on performance excellence, sustainability and climate change mitigation
- Integrate energy performance monitoring and improvement in daily operations & decision-making, & corporate culture
- Sustain commitment and systematic actions in the long-term

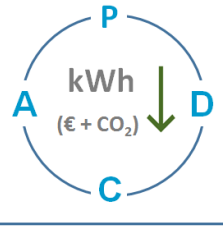
3. Promoting energy management and ISO 50001

Supply & value chain for Energy Management Systems-ISO 50001

EnMS implementation and energy performance improvement → **3rd-party certification to ISO 50001** →

Policies & Regulations

Policy Makers → **Policy Implemen.** → **EnMS Consultants** → **Enterprises** → **EnPerform. Verifiers** → **Lead Audit** | **Cert. Body** | **Accr. Body** → **Financiers & Investors**



- EnMS-ISO50001 reflected in EE Law & Regulation
- Strengthened capacity on EnMS & related policies
- Websites on IEE best-practices
- Government-Industry Working Groups on EE

- Advanced trainings and qualification of EE professionals
- Transfer/License of training material and exams
- Service models

- EnMS Basic and Advanced trainings of industry personnel
- Expert support for EnMS-ISO 50001 implementation
- Trainings on significant energy uses (e.g. energy systems)

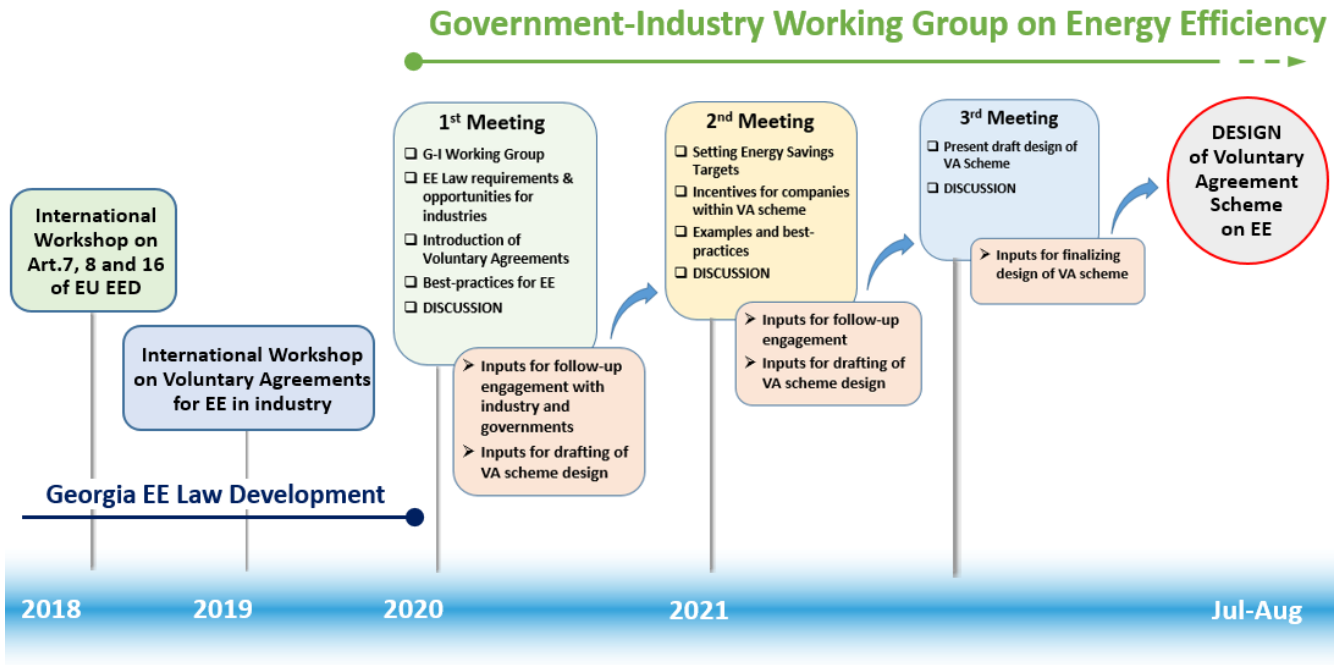
- Training of consultants and enterprises

- Lead auditor training
- Internal auditor training
- Workshops and training for CBs & ACs
- Transfer/License of training material and exams

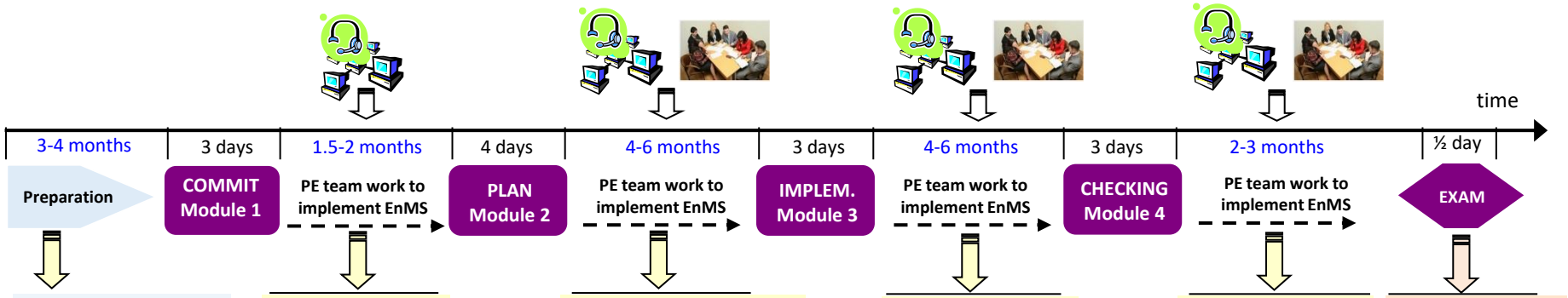
- Awareness raising on EnMS -IEE technologies and case studies
- Development of templates
- Provision of TA for projects/ loans appraisal

Policies and legislation

- Less than 40% of global energy use is covered by mandatory energy efficiency policies & regulations (IEA 2019)
- Few country cases of mandatory implementation of ISO 50001-EnMS. Current draft of "new/updated" EU Energy Efficiency Directive includes obligation for large enterprises to implement and get certified to ISO 50001
- UNIDO ongoing work includes:
  - EnMS-ISO 50001 as part of EE voluntary agreement schemes targeted to industry
  - Fiscal and financial incentives for ISO 50001-EnMS implementation
  - Green public procurement
  - ISO 50001-EnMS Personnel qualification programmes



Expertise, Skills, Service offers and Results



Results:
- Obtain host plant commitment
- Selection of national experts & industry participants
- EnMS Awareness Sessions

Results:
- Draft Energy Policy
- Draft Roles & Responsibility matrix
- Initial data collection

Results:
- Energy Policy
- Roles & Responsibility matrix
- Significant Energy Uses
- Baseline
- Energy Performance Indicators
- Opportunities list & action plans
- Energy & cost savings

Results:
- Staff trained on selected significant energy uses
- Operations & controls improved
- Procurement plan
- EE measures implemented
- Energy & cost savings
- Performance improvements

Results:
- Energy performance checked, verified and reported
- Energy performance reviewed by top management
- Decisions for next period based on internal audit
- Energy savings & …
- Performance impr.

Results:
- Trainee qualified as Energy Management System Expert
- EnMS implemented in PE
- Energy & cost savings
- Performance improvements

Legend

PE team A Partner Enterprise (PE) team is formed by the PE's staff participating in the EXPERT program plus 1-2 national consultants trainees.

Ongoing and periodic communication through webinars, emails and phone calls between international trainers and PE teams to review progress, discuss issues and provide guidance.

Plant visits by national EE consultants trainees

Financing Instruments

Loan Guarantee Fund in Ukraine

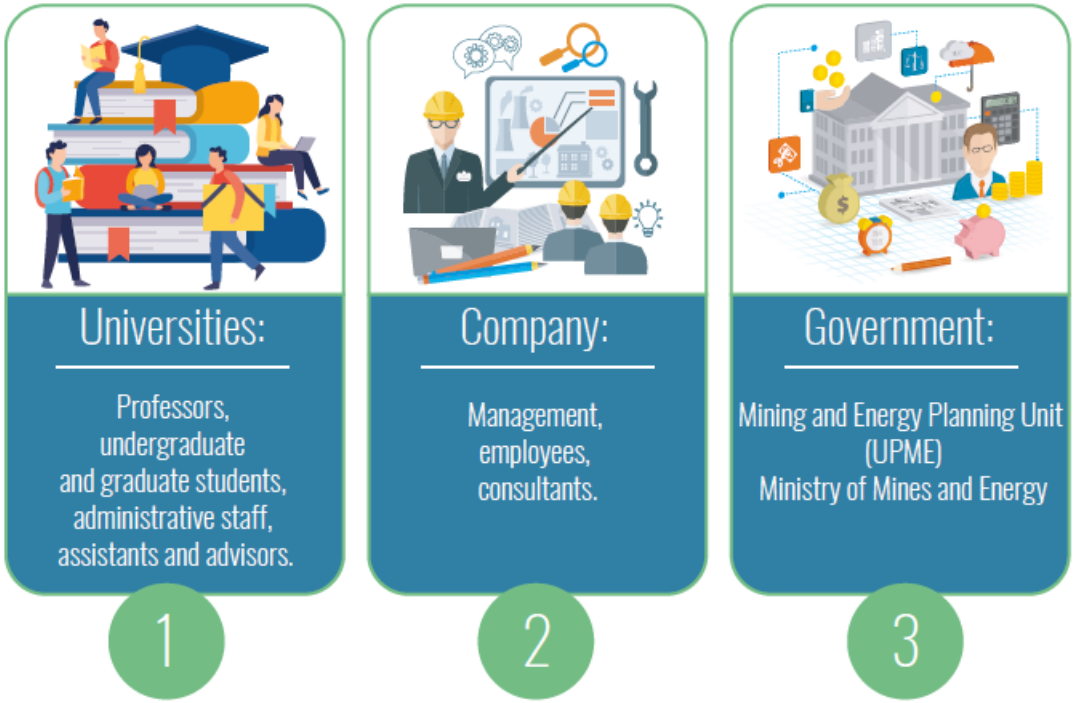
- **Target companies** –
  - SMEs and large companies
  - Industrial enterprises that have gone through UNIDO Project's trainings and carried out SEU assessments
  - Other industrial enterprises (that meet defined criteria)
- **Loan Use** –
  - Implementation of energy management systems (EnMS) in line with ISO 50001:2018, incl. 3rd party certification
  - Energy System Optimization projects (fans, pumps, compressed-air, steam, etc.)
  - Other IEE measures
- **Loan Currency** – Ukrainian hryvnya (UAH), US Dollars, Euro
- **Loan Size** – up to 150,000 USD and above
- **Guarantee** – 100 % on up to 150,000 USD of loan principal
- **Loan Interest** – market reduced rate
- **Loan Repayment** – 18-24 months

Partnership between Government, Universities and Industry

Industrial Assessment Program PEVI in Colombia

Objectives

- Strengthen technical capacities of universities in energy efficiency
- Provide practical/on-the-job education on energy management systems and energy efficiency to current and future industry workforce (students and employees)
- Promote and disseminate use of tools to support EnMS-ISO 50001 implementation, and identify EE opportunities
- Support greater university-company interaction that, without technological bias, make local companies aware about advantage and relevance of performing energy management



Industrial Energy Accelerator

https://www.industrialenergyaccelerator.org/

- A UNIDO-led network of initiatives working to demonstrate the vast opportunities that industrial energy efficiency can provide for people, businesses, economies and the planet.
- UNIDO experts work in partnership with key government agencies and industry stakeholders to help drive momentum for energy efficiency.
- Focus Areas:

KNOW-HOW FOR INDUSTRY

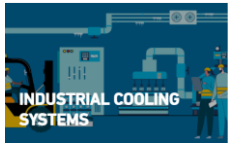
FINANCING FOR EFFICIENCY

SUPPORT FOR SMEs

ADVOCACY & POLICY SUPPORT

RENEWABLES FOR INDUSTRY

Efficiency Solutions → Media Kits on

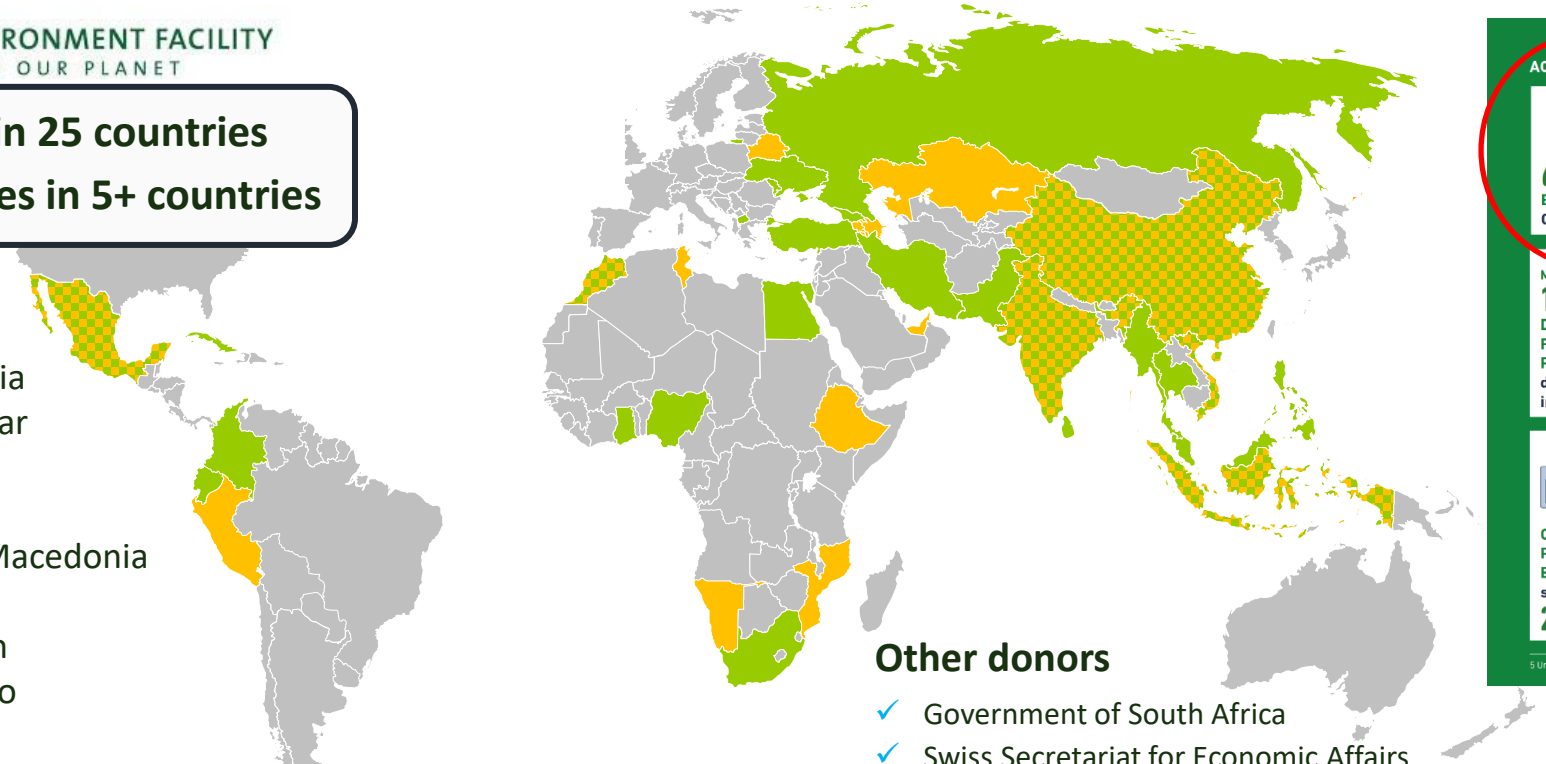


Resources → Case studies, articles, infographics, videos, tools, country diagnostic reports, etc.

UNIDO Global EnMS-ISO 50001 Programme (2010-2020)

GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Operational in 25 countries
Planned activities in 5+ countries



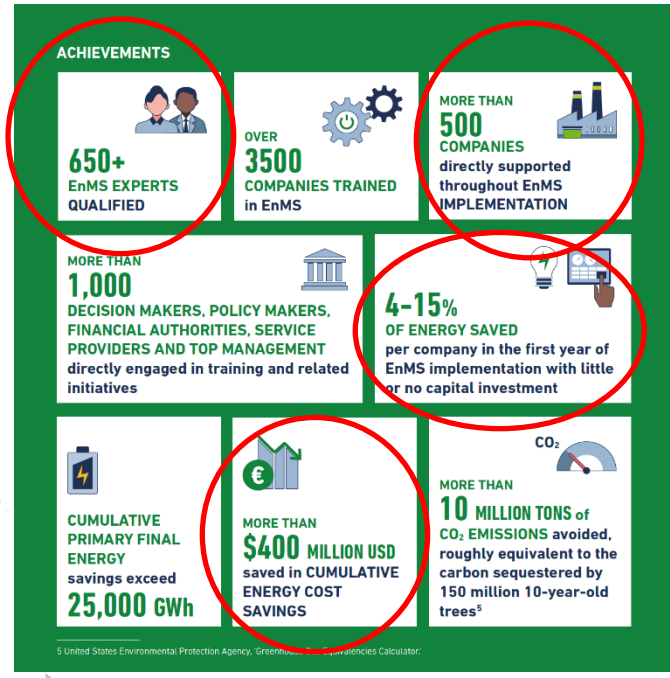
Projects

South Africa
Moldova
Russia
Turkey
Ecuador
Malaysia
Thailand
Viet Nam
Philippines
Indonesia
Egypt
Iran
Ukraine
Colombia
Myanmar
India
Georgia
North Macedonia
Mexico
Pakistan
Morocco
Cuba
Nigeria
Sri Lanka*
Ghana*

Discussing activities

Other donors

- ✓ Government of South Africa
- ✓ Swiss Secretariat for Economic Affairs
- ✓ UK Dept. for International Development
- ✓ Government of Italy
- ✓ Government of Austria
- ✓ European Union
- ✓ Green Climate Fund



4. Energy management and ISO 50001 in Oil and Gas

Implementation of EnMS-ISO 50001 in Oil & Gas is growing

CEM Energy Management Leadership Awards

https://cleanenergyministerial.org/initiative-clean-energy-ministerial/energy-management-leadership-awards


ISO 50001 Energy Management System Implementation: Case Study

2021

Abastible S.A.

Lenga Plant

Aereal view Lenga Plant Abastible S.A.

Organization Profile & Business Case

Abastible was founded in 1956 as a subsidiary of the Copec S.A. group of companies. It is one of the market leaders in the liquefied petroleum gas (LPG) and energy solutions industry with operations in Chile, Peru, Ecuador and Colombia. The company has the largest network of distributors in Chile with 10 plants located from Arica to Coyhaique, through which it meets the energy needs of homes, industries, businesses, and other sectors in a safe, timely and environmentally friendly manner.

Motivation and Drivers

Sustainability is an integral part of our mission and purpose as an organization. We believe in striking a balance between economic growth, environmental protection, and social wellbeing. Our roadmap incorporates sustainability to operate and generate value in our supply chain. At Abastible, we are leading the energy transition in the regions where we operate.

We understand that the sustainable management of our organization must permeate our structure, culture and relationship with other stakeholders. Abastible involves

ISO 50001 Energy Management System Implementation: Case Study

2021

Compañía MEGA SA

We add value to Energy.

We are the 1st midstreamer in Argentina certified for ISO 50001:2018

MEGA´s Loma La Lata Plant

1. Organization Profile & Business Case

Organization. Compañía Mega SA (we call it just "MEGA") started operations in April 2001. We process natural gas from the Neuquén Basin (called "VACA MUERTA"), separate its rich components at the Loma de la Lata Plant (Province of Neuquén, Argentina) and return the remaining gas (basically methane) to the main pipelines carrying gas to industrial and residential areas in Argentina.

A pipeline (600 Km, 12" ø) transporting the rich components, runs through Provinces – Neuquén, Río Negro, La Pampa up to Buenos Aires, where ethane, propane, butane and gasoline are fractioned at the Bahía Blanca Plant. Our Head Office is in the city of Buenos Aires.

Motivations/drivers. Being the natural gas our main "raw material", a detailed care of the energy we use has been present since the very beginning of our operations.

ISO 50001 Energy Management System Case Study

China

Yumen OilField company of CNPC

Yumen oilfield company is the first oil field certificate ISO 50001 in CNPC.

Yumen Oilfield Production Command Center.

Organization Profile & Business Case

Company profile: Yumen oilfield was developed and constructed in 1939. it was built as first natural petroleum base in China .In 2018,Yumen oilfield has extracted 410 thousand tons of crude oil and processing 2.1 million tons of crude oil with total output value of ￥12.7 billion. Its total energy consumption is 516 thousand tons of standard coal, and total energy consumption of Industrial output value is 0.36 tons standard coal, decreased by 4.8% and 26.3% compared 2015.The task "double control" of government energy consumption has been achieved.

"As a energy production company, we should reduce the energy consumption ,Only in this way can we develop sustainably."

—Chen Jianjun,general manager of yumen oilfield

Case Study Snapshot	
Industry	Petroleum and natural Gas Exploitation
Product/Service	crude oil, petroleum product, electricity, heating power; machinery equipment
Location	Jiuquan, China
Energy management system	ISO 50001
Energy performance improvement period	3Years
Energy Performance Improvement (%) over improvement period	7.42%
Total energy cost savings over improvement period	US $ 6.854 million
Cost to implement EnMS	US $ 1.35 million
Total Energy Savings over improvement period	731750 (GJ)
Total CO2-e emission reduction over improvement period	62500(Metric tons)

EnMS Drivers: Yumen oilfield regards the construction of energy management system as an important starting point and breakthrough for enterprises to increase revenue, reduce expenditure, reduce costs and increase efficiency. By strengthening energy control and management, paying close attention to the implementation of responsibilities, adjusting and optimizing the structure, and implementing potential improvement, it has promoted the green, low-carbon and high-quality steady development of enterprises.

The function of Energy Management in Corporate Strategy : By implementation of the energy management system, it effectively improves the

aramco
Haradh Gas Plant Department (HdGPD)

Saudi Arabia

OLDELVAL
OLEODUCTOS DEL VALLE S.A.

Oleoductos del Valle
Argentina

MEGA
COMPAÑÍA MEGA S.A.

Argentina

abastible

Chile

LASAU
LUBRICANTES

Argentina

CNPC

Yumen Oilfield Company
China

中国石化
SINOPEC

Sinopec Zhenhai Refining &
Chemical Company, China

Chandra Asri
Petrochemical

Indonesia

THANK YOU!

For more information:

Mr. Marco MATTEINI

Industrial Development Officer

E-mail: M.Matteini@unido.org

Energy Systems and Infrastructure Division

Department of Energy

UNIDO