



**INDUSTRIAL
ENERGY
ACCELERATOR**

MEXICO

**Industrial Energy Accelerator
MEXICO Diagnostic**



About the Industrial Energy Accelerator

In partnership with key government agencies and industry stakeholders, the Industrial Energy Accelerator works on the ground to rally government, industry and finance around solutions that ignite change in industries. We then take our knowledge and experience to the world, sharing what we have learned to inspire a global movement for industrial energy efficiency. We currently operate in Indonesia, China, Mexico, Brazil and Morocco, five major industrial countries responsible for around 26% of the world's energy consumption.

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Industry is also responsible for 55% of Mexico's GHG emissions (INECC, 2014), of which 41% from cement, siderurgical and chemical sectors.



What is the target market?

Industries are responsible for 25% of Mexico's GDP and consume 31% of the country's energy as of 2015 while employing 31% of the working population (INEGI, 2014).

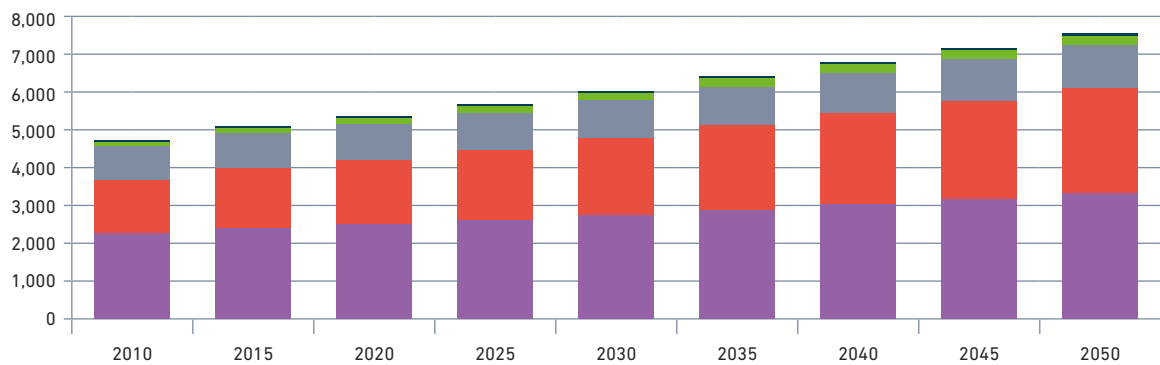
In 2016, Small and Medium-sized Enterprises (SMEs) represented 99.2% of Mexican companies, contributing to 52% of national GDP. From this, industrial SMEs are 12% of the total SMEs.

estimates that Business as Usual (BAU) energy consumption will be 7,000 PJ in 2050, up from 5,000 in 2015; in this scenario industry will account for 36% of the total up from 31% in 2015 (SENER, 2016).

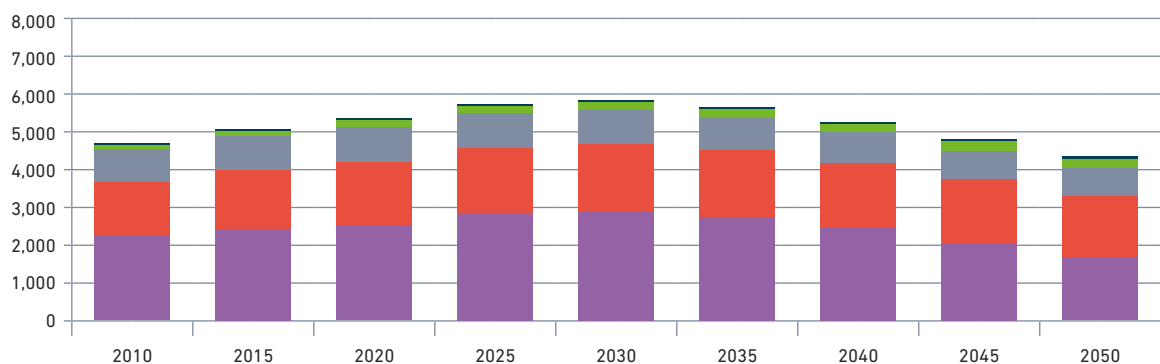
Industry is also responsible for 55% of Mexico's GHG emissions (INECC, 2014), of which 41% from cement, siderurgical and chemical sectors. The government

The transition scenario developed by SENER projects that industry could reduce its energy consumption by 41% to 2050 (Figure 1).

Total final energy consumption by sector, baseline scenario 2016-2050 (Petajoules)



Total final energy consumption, transition scenario 2016-2050 (Petajoules)



Source: SENER, 2016

Figure 1. Mexico's EE potential by 2050 in PJ

Are there drivers to action?

Mexico has a sophisticated policy and regulatory set up driving action on energy efficiency (See Table 1). This legal framework embraces federal level policies including the General Law of Climate Change mandating sector specific reductions in emissions, which are a strong driver of energy efficiency.

There are also several cross-sector programmes and institutions such as the National Commission for Efficient Use of Energy (CONUEE) providing support to the private sector for implementing energy efficiency (EE) interventions. Industrial sector is under this framework through specific programmes focused on SMEs.

It must be pointed out that industrial sector's programmes lead by CONUEE, FIDE and international cooperations are based on the advice of additional consultants due to the lack of energy professionals inside the industrial organisations.

In terms of energy prices in Mexico, these are subsidized for the residential sector, but this subsidy does not apply to the industrial sector, which in fact faces higher costs than developed countries such as the United States of America (USA) and Canada (see Appendix). This means prices in the industrial sector are a strong driver for energy efficiency.

TABLE 1. Summary of EE existing plans and regulations

NAME OF LEGISLATION	KEY TARGETS/SUMMARY
FEDERAL PLANS	
Nationally Determined Contributions (NDC)	Mitigate 22% of its GHG emissions by 2030, equivalent to a reduction of 210 equivalent megatonnes (Mt) of GHG. (Unconditional) Generate 35% of clean energy in 2024 and 43% by 2030
General Law of Climate Change (LGCC)	In 2020, mitigate 30% of GHG emissions in reference to a baseline (2000) and mitigate 50% relative to emissions of the year 2020
Energy Sectoral Program (PROSENER)	In 2018, ensure that 51% final national energy consumption is covered by energy efficiency regulations, growing from 46% in 2013
Strategy of Transition to Promote the Use of Cleaner Technologies and Fuels (STRATEGY)	Average annual reduction rate of 1.9% in the intensity of final energy consumption for 2016-2030 Average annual reduction rate of 3.7% in the intensity of final energy consumption for 2031-2050

NAME OF LEGISLATION	KEY TARGETS/SUMMARY
CROSS-SECTOR FEDERAL PROGRAMMES	
Special Energy Transition Program (PETE)	Certified energy efficiency and renewable energies professionals. Baseline (2015) 388 certified professionals. Target (2018) 2,481 certified professionals
Special Program of Climate Change 2014-2018 (PECC)	PECC aims to reduce GHG emissions by approximately 83 MtCO ₂ e by 2018 and it includes the contribution of the Federal Public Administration for the period 2014-2018 to help meeting the objective set for 2020 in the LGCC of reducing GHG emissions
Energy Efficiency Roadmap	Roadmap to achieve the objectives of the STRATEGY
Program for the Sustainable Use of Energy (PRONASE - 2014-2018)	Strengthen national programs about standardisation, development EE projects and capacity building
CROSS-SECTOR FEDERAL REGULATION	
Energy Transition Law (LTE)	Mandates CONUEE to support the development of energy efficiency in the country, including via the creation of an EE roadmap Includes the Voluntary Agreement scheme for Energy Management Systems in energy intensive industries
INDUSTRIAL SECTOR PLANS	
CONUEE's SME program	Promotes the sustainable use of energy for SMEs, through dissemination of information on technologies and best practices, as well as promotion of similar support programs of other institutions
Introduction of Energy Efficiency and Energy Management Systems in SMEs in Mexico Program (CONUEE - PTB)	Support to SMEs to implement Energy Management Systems that allows them to apply sustainable energy use measures in their daily practices, including energy efficiency
NAMA Eco - Credito Empresarial Program (FIDE-GIZ)	Target: Financing of MXN \$165 MM by December 2013 - to encourage SMEs to implement energy efficiency measures. The initiative offers finance to small businesses to substitute inefficient commercial refrigeration, air conditioning equipment, electric motors and upgrade lighting systems of up to MXN \$350,000 and is still ongoing
Voluntary Agreement Scheme for Energy Management Systems in Energy Intensive Industries	Under the Energy Efficiency component of the Mexican-Danish Climate Change Mitigation and Energy Program, Denmark has co-operated with CONUEE to develop a Voluntary Agreement Scheme, as one of the most cost-effective measures to reduce energy consumption. First agreement was released at the end of 2017

Is there a supply chain for energy efficiency?

The energy efficiency supply chain in Mexico is moderately developed, however, more support is needed in the industrial sector.



In terms of supply chain support, the Electric Power Savings Trust Fund (FIDE), a private entity funded by the State Utility CFE, provides a list of certified technology suppliers for industrial energy efficiency equipment. Other institutions provide similar services for other sectors – for example FIRCO for agriculture.

There are fiscal incentives for SMEs to buy efficient equipment, which supports the growth of the supply chain, however this to be fairly limited both in scope and size. Furthermore in some cases import tariffs and similar restrictions create barriers to purchasing EE equipment for companies and EE providers.

Supply chain and energy efficiency market

The presence and size of the ESCO market in a country reflects the efforts to advance energy efficiency through effective business models and creative financing (ACEEE, 2016). Energy services companies (ESCOs) in Mexico typically offer services for the private sector, industry and commercial hotels. According to the ACEEE, the size of market for ESCOs in Mexico represents 0.0040% of its GDP and it has grown slowly.

As a common local ESCO practice, project investment is typically absorbed by the same ESCO and commercial banking has managed to directly finance the ESCOs to implement project for private customers. Furthermore, in Mexico the ESCO business contracts are typically from less than 1 year up to 5 years.

The ESCO market is not well developed and capacity building in this sector of the supply chain is one of the recommendations of the Energy Efficiency Roadmap which was recently published in Mexico (CONUEE, 2017).

TABLE 2. Financial mechanisms to support EE in Mexico

PROGRAM/ CREDIT LINE	AMOUNT	INTEREST RATE	TERM	OTHER/COMMENTS
FOTEASE Mexican energy transition fund	7,022 million pesos	Undisclosed	2009-2018	
FIDE-NAFIN Credit for inefficient equipment replacement	Up to 400 thousand pesos per loan, total N/A	Maximum 20% per year	Up to 4 years	Bonus for scrapping Up to 10% of the cost of replaced equipment
Bancomext Credit line to sustainable projects	100 million USD	Undisclosed	Undisclosed	Japan Bank for International Cooperation (JBIC)
FIRA Credits to EE projects in agroindustry	243 thousand USD per loan (technology) 1 million USD per loan (cogeneration)	Undisclosed	Undisclosed	
KfW German credit line	29.7 million euros	Undisclosed	During 2017	Eco-credit industrial SME
FIRCO Credits to EE projects in agroindustry	Contributions: World Bank 17.52 million pesos, beneficiary 14.71 million pesos. Total amount 32.23 million pesos	Undisclosed	2000-2016	

Financial instruments available for energy efficiency

Regarding financial mechanisms there are at least 6 credit lines focused specifically on energy efficiency projects: FOTEASE, FIDE and FIRCO as national public instruments; credits from development banks, such as FIRA, NAFIN and kfW (see Table 2). Overall, rates are fairly high and represent a barrier to implementation. **Thus, the total amounts available are relatively limited compared to the size of the opportunity, meaning a considerable gap in finance provision remains.**

In this context, FIDE operates a credit line with NAFIN in the Eco-Credito empresarial programme targeting specifically technology replacement in SMEs.

Technical assistance initiatives

Based on the public sector efforts, FIDE is also the main provider of technical assistance (TA) and energy audits, focused exclusively on SMEs. CONUEE provides support in the form of certification of products and technologies, while several internationally funded initiatives are also focusing on TA for SMEs. Recently the German cooperation agency, GIZ, successfully submitted a programme proposal for an energy efficiency programme for SMEs to the NAMA Facility, which should become operational in 2019. This can be considered the only industry-specific initiative that supports the deployment of Energy Management Systems in industrial SMEs.

In conclusion TA for the industrial sector is relatively limited and only focuses on SMEs, and this situation is unlikely to be ameliorated in the short term.

What are the barriers holding back Mexico's energy efficiency market?

Given the relative lack of TA and finance mentioned above, an array of barriers limits the realization of the industrial EE opportunity.



Table 3 summarizes the main barriers restraining the market categorizing them as awareness and commitment, technical, and financial.

TABLE 3. Summary of barriers limiting EE development in Mexico

CATEGORIES	MAIN BARRIERS
<p>Awareness and commitment Barriers weakening the demand for EE products & services</p>	<p>Lack of awareness to disseminate the EE national programmes and best practices.</p> <p>Higher cost of more efficient technologies limits their uptake</p> <p>Lack of trust in technologies, technology suppliers and project implementers.</p> <p>Lack of policies mandating EE implementation</p>
<p>Technical barriers Limiting their capacity to create a high-quality pipeline and service it</p>	<p>Insufficient inter-institutional coordination generates mistrust and annoyance between the industry sector as they are subject to conflicting requirements and regulations</p> <p>Lack of technical knowledge and skills within companies</p>
<p>Financier-related barriers Limiting the attractiveness of existing finance</p>	<p>Lack of finance and incentive schemes limits to accelerate the EE implementation projects.</p> <p>Lack of knowledge of energy efficiency on the part of commercial banks' staff</p>

What solutions can address these barriers?

To better understand the potential solutions, we mapped the barriers again using the Pillars as a guide.

Some of these solutions can address the lack of drivers (e.g. policy development) or counteract them (e.g. incentives). An effective package of solutions should always be aligned to the drivers and tackle the barriers. The following figure presents an analysis of the stronger solutions that tackle the main barriers.

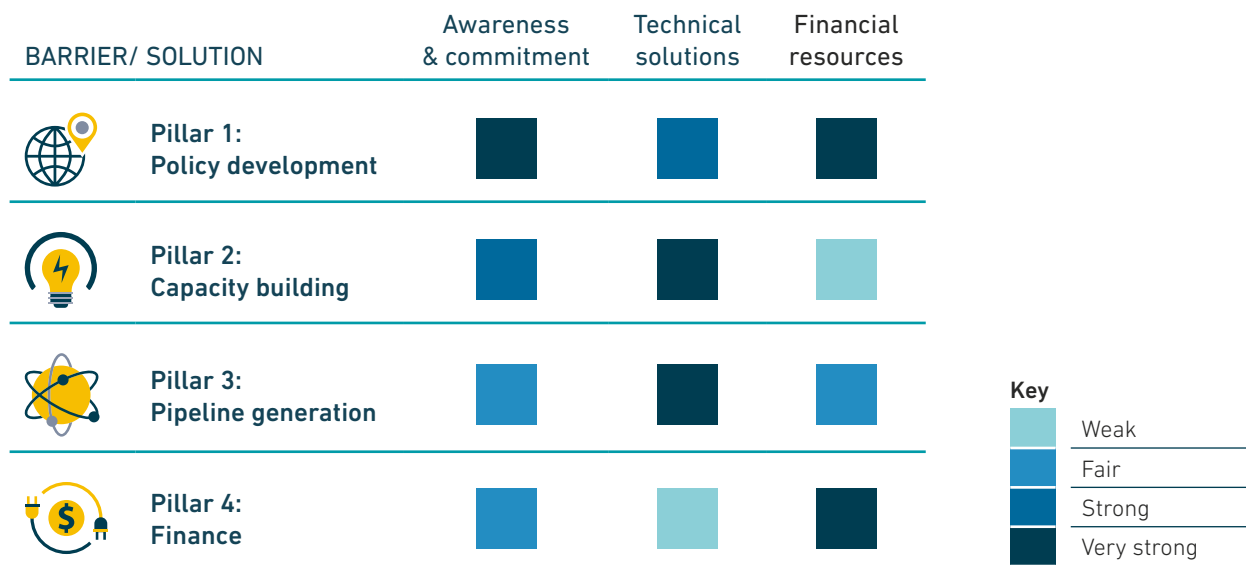


Figure 2. Assessment of solutions for tackling key barriers

A number of initiatives that the Accelerator could support were defined in workshops with the Ministry of Energy (SENER) and CONUEE. Up to two initiatives were selected per pillar but these could work in tandem – e.g. initiatives across multiple pillars could be pursued.

Policy

In-depth study to design and develop a white certificate scheme in Mexico: white certificates could help plug an important gap in Mexico’s energy efficiency regulatory framework. Clean Energy Certificates (CECs) already exist for renewable energy.

Capacity building

Expand the voluntary agreements scheme set up by Denmark with a focus on ISO 50001: pilots could be run with key companies seeking commitments in reductions to energy consumption and working towards a national programme.

Strengthening of human resources for an energy certification scheme for Energy Auditors and Energy Managers: Create an accreditation mechanism for energy consultants to increase trust in technologies and energy efficiency benefits.

Pipeline creation

Knowledge sharing and data provision including benchmarking: this work could support the Voluntary Agreements workstream by providing better access to information and benchmarking tools.

Finance

Identification of opportunities for expansion of EE finance schemes: working of existing schemes such as FIDE’s ECO-Credito Empresarial.

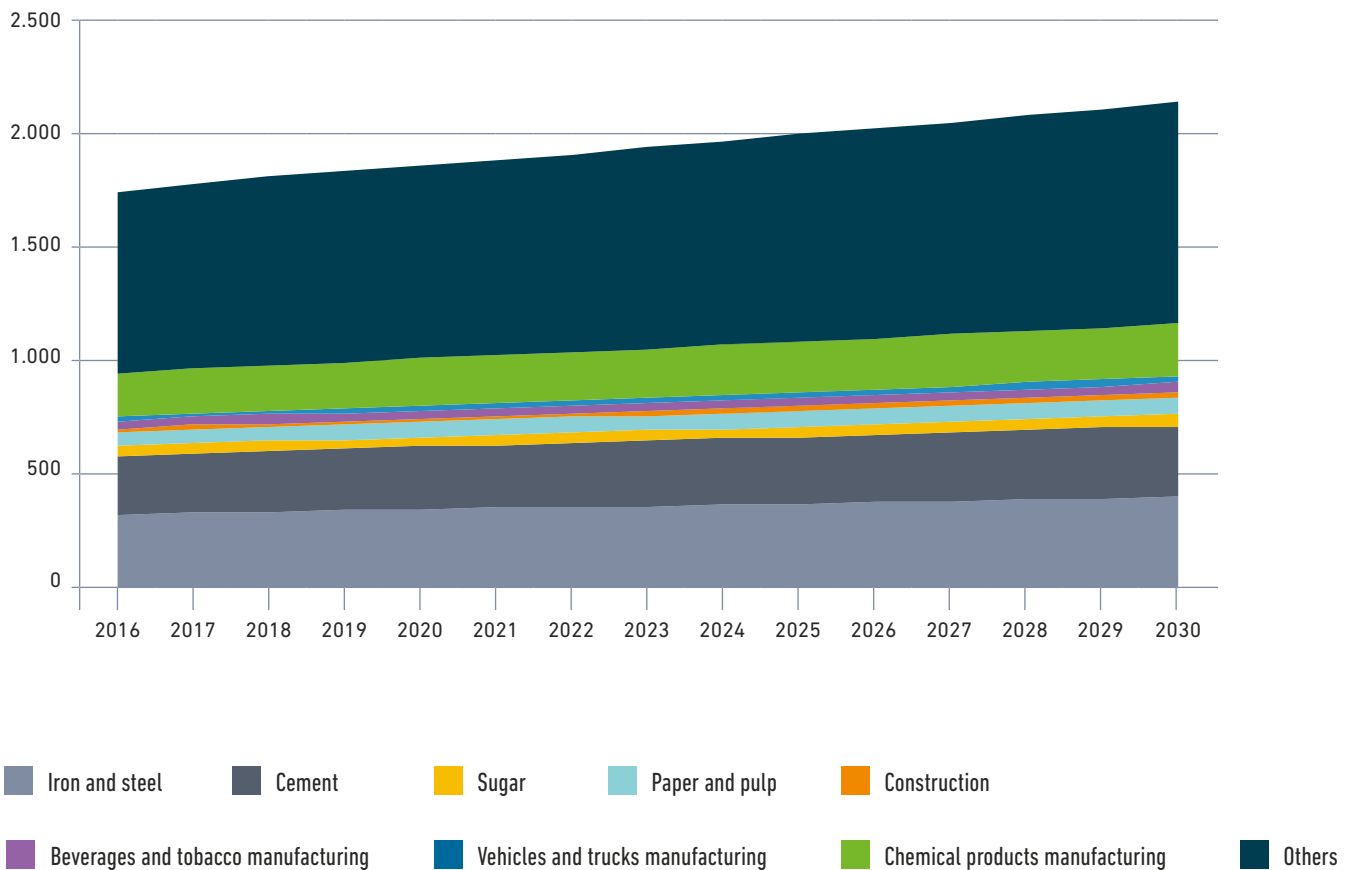
A more comprehensive treatment of barriers and solutions can also be found in the Appendix.

APPENDIX

Getting to know the target market: Mexico’s industrial sector profile

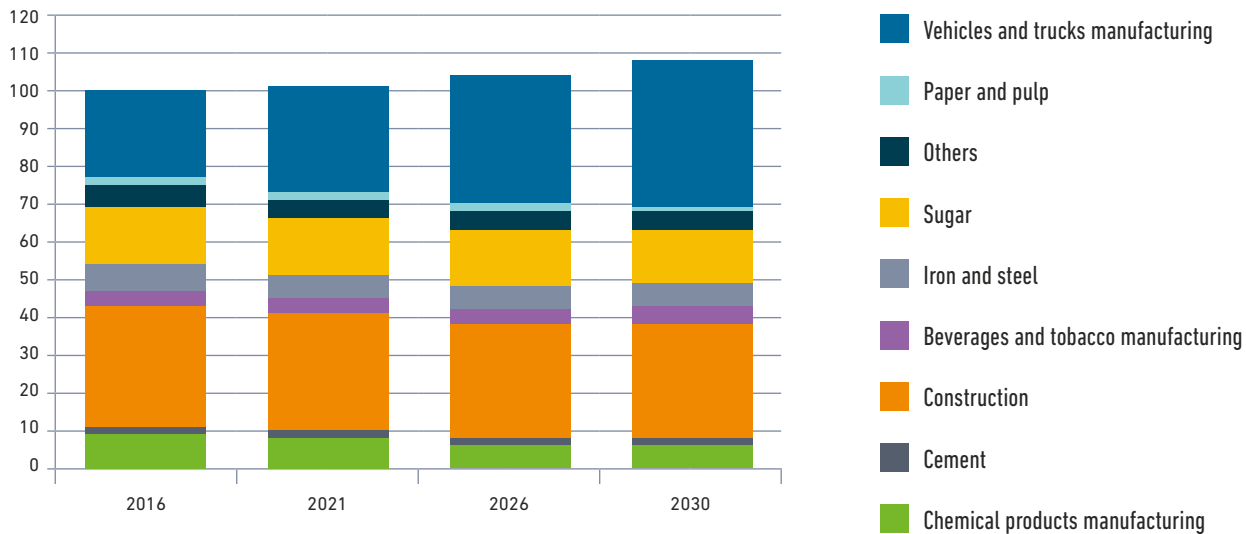
In 2016, Mexico consumed a total of 1,681 PJ (See Figure 3). The greatest known contributors within the Industrial sector are Iron and Steel, Chemical product manufacturing, Cement among Other Industry. Industrial energy consumption is expected to grow around 4% PA from 2016-2030. Thus, the projected consumption will be 2,033 PJ by 2030. This growth will be led by export industries such as beverage, vehicles manufacturing and chemical products.

Industry accounted for MXN \$4 trillion in 2016 representing 24% of national GDP. Industrial GDP value will increase from MXN \$4.1 to \$5.2 trillion over 10 years, though its participation to national GDP will be stable at 25%. (INEGI, 2014). As it is shown in Figure 4, vehicles and truck manufacturing sub-sector will increase its contribution in the coming years.



Source: own elaboration with data from (SIE, 2017)

Figure 3. Industrial sub-sectors’ energy consumption in the period 2016 - ‘30 (PJ)

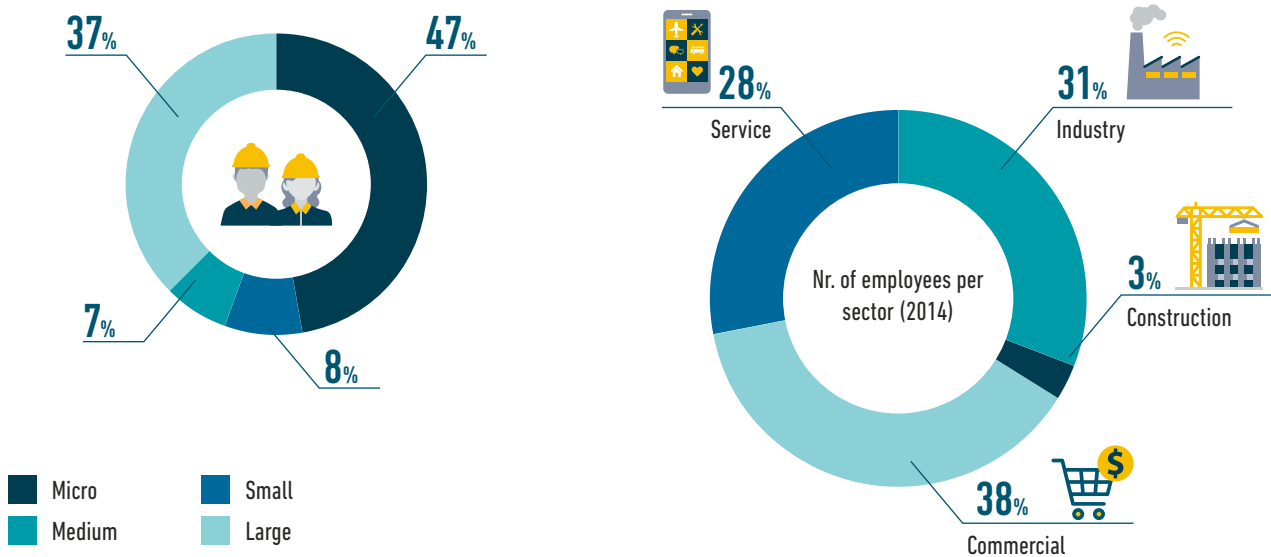


Source: own elaboration with data from (INEGI, 2016)

Figure 4. Share of GDP by industrial sub-sector 2016 - 2030

In terms of size and number of companies in Mexico, the industrial sector accounts for 31% of the country's employment; while 63% of total employment (including non industrial) is in SMEs.

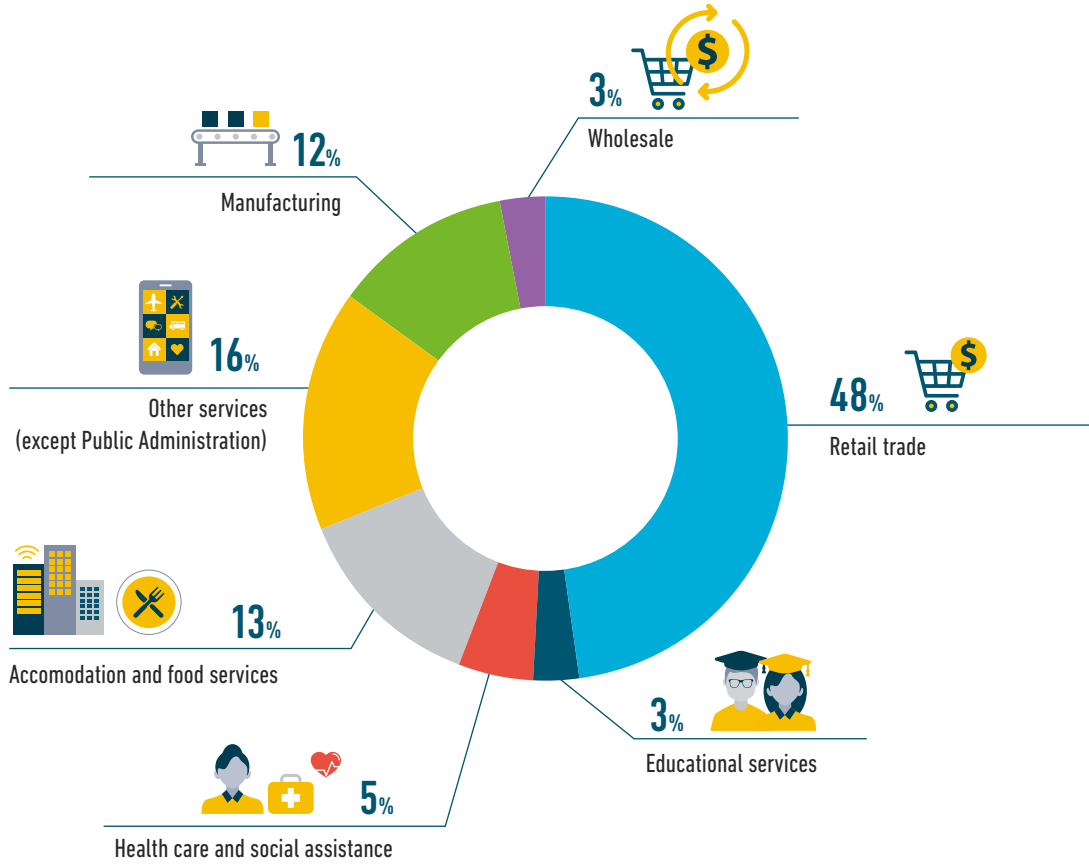
Nr. of employees per company size (2014)



Source: own elaboration with data from (INEGI, 2014)

Figure 5. Share of employees by sector and company size

SMEs are vital to Mexico's economy. They make up 99.8% of businesses, are responsible for 63% of formal employment and generate 52% of Mexico's GDP. In this context, Industrial companies represents 12% of the SMEs in the country.



Source: INEGI, 2016

Figure 6. Share of SME activities in Mexico in 2016

Considering industrial GHG emissions, BAU emissions from industry are projected to increase 3.4% PA to 334 MtCO₂e by 2030 (See Figure 7). As a result, Mexico's total emissions in 2030 will be ~900 MtCO₂e, meaning industry will account for 37% of country's emission. While the biggest single emitting sectors are cement, chemicals and iron and steel, together they account for less than a third of the total.

A 2012 GIZ study identified a large potential for energy efficiency in industrial SMEs (Table 4). This study shows that a reduction of 10% carbon emissions represent 5,423 ktCO₂e as potential carbon savings and MXN \$11, 765 million in cost savings. Other benefits identified are strengthening competitiveness, increase sales of 'greener' products, employee motivation, mitigation against the impact of future regulation.

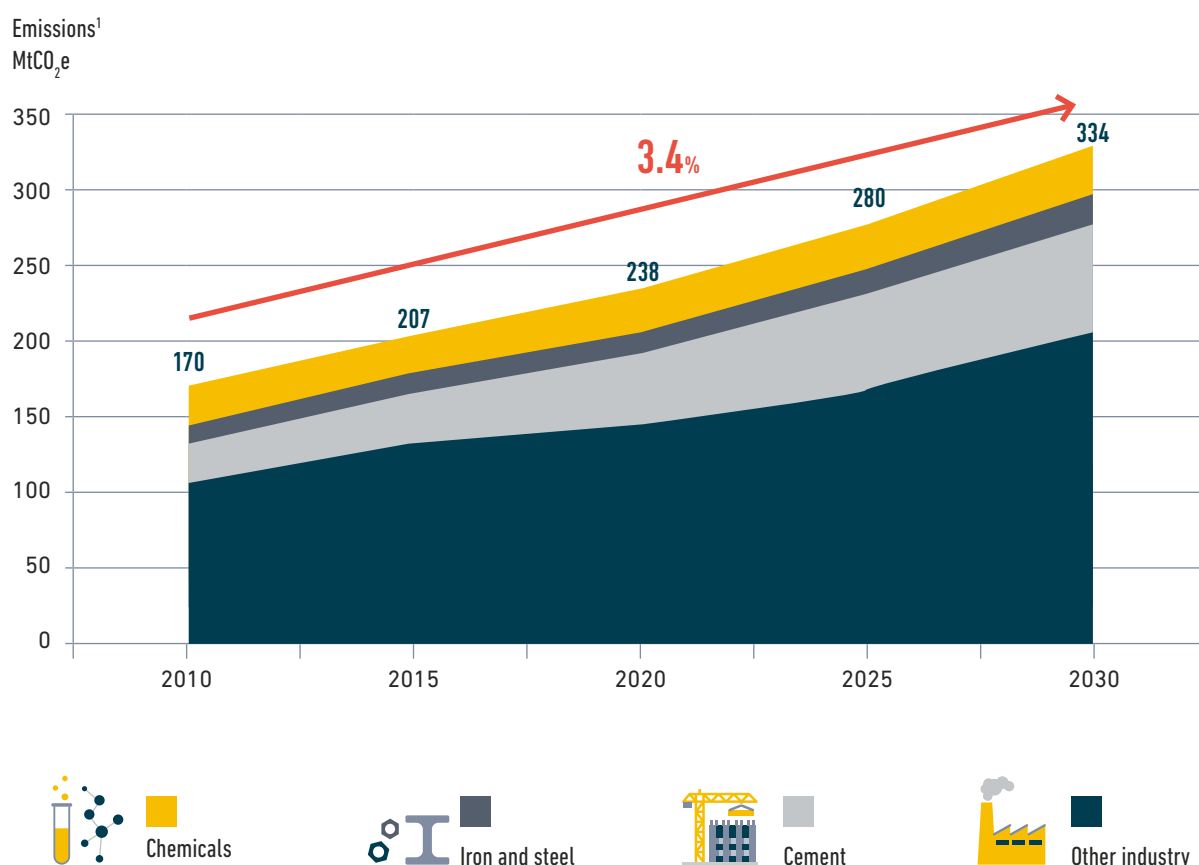


Figure 7. Industry's BAU emissions projected by 2030

TABLE 4. Potential savings in the SME's subsectors

SECTOR	Total carbon emissions (ktCO ₂ e)	Total energy costs (millions MXN)	Potential carbon savings (ktCO ₂ e)	Potential cost savings (millions MXN)
Commerce / services	10,587	\$71,237	1,635	\$8,659
Industry	50,447	\$107,588	5,423	\$11,765
Other inc. agriculture	14,098	\$46,432	2,618	\$7,857
Total	75,131	\$225,257	9,676	\$28,283

Source: (GIZ, 2012) Assumes average electricity saving of 19% for commerce/services, 11% for industry and 30% for agriculture, and thermal energy savings of 10% across all sectors.

Drivers for industrial energy efficiency in Mexico

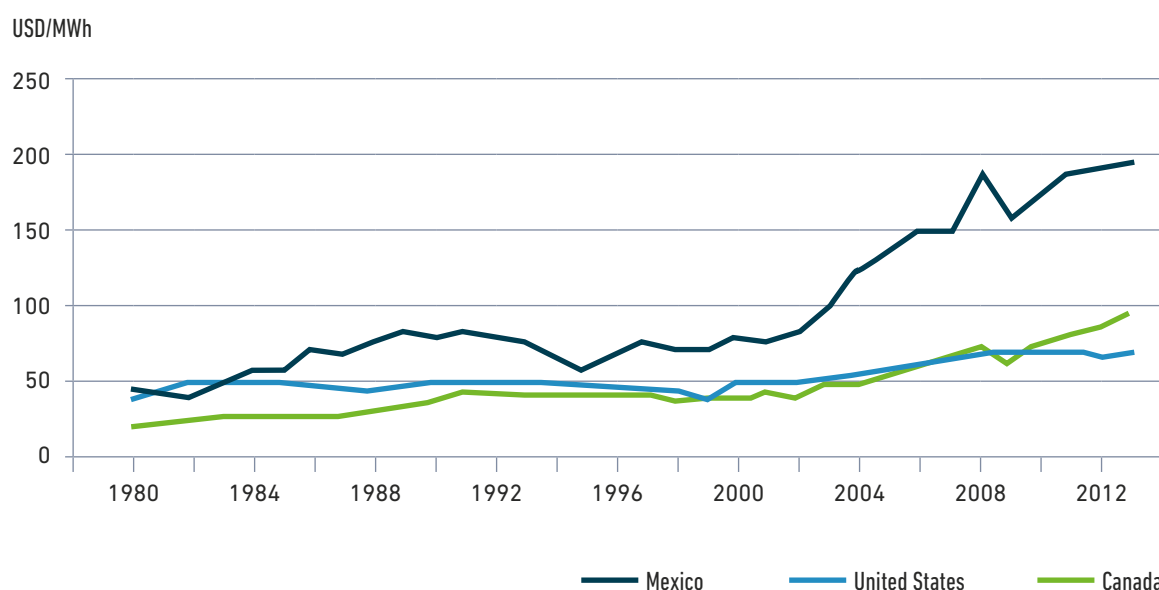
Mexico has federal plans and regulations addressed to the energy efficiency, a few of those focused on the industrial sector, most of these are related to the implementation of EE measures in SMEs. The following table summarizes the EE existing plans and regulations.

TABLE 5. Summary of EE existing plans and regulations

KEY NATIONAL LEGISLATION
Energy Transition Law
General Law of Climate Change (LGCC)
Energy Sectoral Program (PROSENER)
Strategy of Transition to Promote the Use of Cleaner Technologies and Fuels (STRATEGY)
CROSS-SECTOR NATIONAL PROGRAMMES
Special Energy Transition Program (PETE)
Special Program of Climate Change 2014-2018 (PECC)
Energy Efficiency Roadmap
Program for the Sustainable Use of Energy (PRONASE - 2014-2018)
FUNDS FOR ENERGY EFFICIENCY
Fund for Energy Transition and Sustainable Energy Use (FOTEASE)
Sustainable Energy Fund (FSE)
Programme of Energy Savings in the Electricity Sector (PAESE)
Energy Efficiency Standardization Program
INDUSTRIAL SECTOR STRATEGY
Energy Efficiency Roadmap for Industrial Sector (To be published)
National Program for Energy Management Systems (PRONASGEN)
Eco Business Credit Program by FIDE
CONUEE's SME program
Introduction of Energy Efficiency and Energy Management Systems in SMEs in Mexico Program (CONUEE PTB)
NAMA Eco - Credito Empresarial Program (FIDE-GIZ)

According to International Energy Agency, historically the industrial sector in Mexico have faced higher costs than the USA and Canada (IEA, 2016). As it is shown in Figure 8, the average prices from electricity sales to the industrial sector have increased. This means prices are a strong driver for energy efficiency.

Industrial electricity prices declined by 24% in 2015 and 2016; even though, it is still relatively higher than in United States.



Source: IEA, 2016

Figure 8. Electricity prices for the Industry in North America

Reducing electricity costs was one of the main goals of the Energy Reform, to be achieved by the profound restructuring of the sector so as to capture efficiency improvements and lower costs through competition, as well as alleviating the cost burden of subsidies on the state (or CFE). Lower imported gas prices and the increasing switch from fuel-oil to gas in power generation have also decreased the cost of power generation in 2014-15 by 37% which in turn has helped reduce the average cost of supply by almost 20% since 2013. To ensure a competitive market, the bids in the electricity wholesale market must

be based on costs, which means that generation companies will not be allowed to bid above their short-term marginal costs in this market.

Large industrial consumers may also continue to self-supply their consumption, just as was the case before the energy reform, or enter into bilateral agreements “off market” (See Table 6). The electricity reform is also opening the perspective of retail competition. Only qualified users (i.e. large industry) can buy electricity directly from the market, but these consumers may still remain under regulated tariffs.

TABLE 6. Share of total capacity of electricity in the country

Producer	Total capacity [GW]	Share of total capacity
CFE	41.90	61.6%
Independent producers	12.95	19.0%
Self-supply	7.13	10.5%
Small producers	0.065	0.1%
Cogeneration	3.65	5.4%
Exports	1.40	2.1%
Total	68	100%

Source: OECD/IEA, 2016 & OECD/IEA, 2017

Is there a supply chain for industrial energy efficiency in Mexico?

The EE efforts are mainly carried out by the public sector, depending on the faculties of multiple entities. For instance, the Ministry of Environment and Natural Resources (SEMARNAT), lead the climate change mitigation and adaptation strategies through the National Institute of Ecology and Climate Change (INECC). On the other hand, the Ministry of Energy has a number of programs of advice and finance renewable energy and energy efficiency, where CONUEE complement the specific efforts addresses to energy efficiency programs and the faculties

mentioned in the Energy Transition Law. Besides this, the Energy Regulatory Commission (CRE) establishes electricity transmission and distribution rates, grant permits for electricity generation and grants permits for transportation, storage and distribution activities of fuels. In FIDE, a public – private fund promoting electricity savings, the industrial scope is covered by programs to advice and technical assistance to modernise facilities and apply new technologies in productive sectors. Main stakeholders from the public sector are shown in Figure 9.

MEXICAN GOVERNMENT

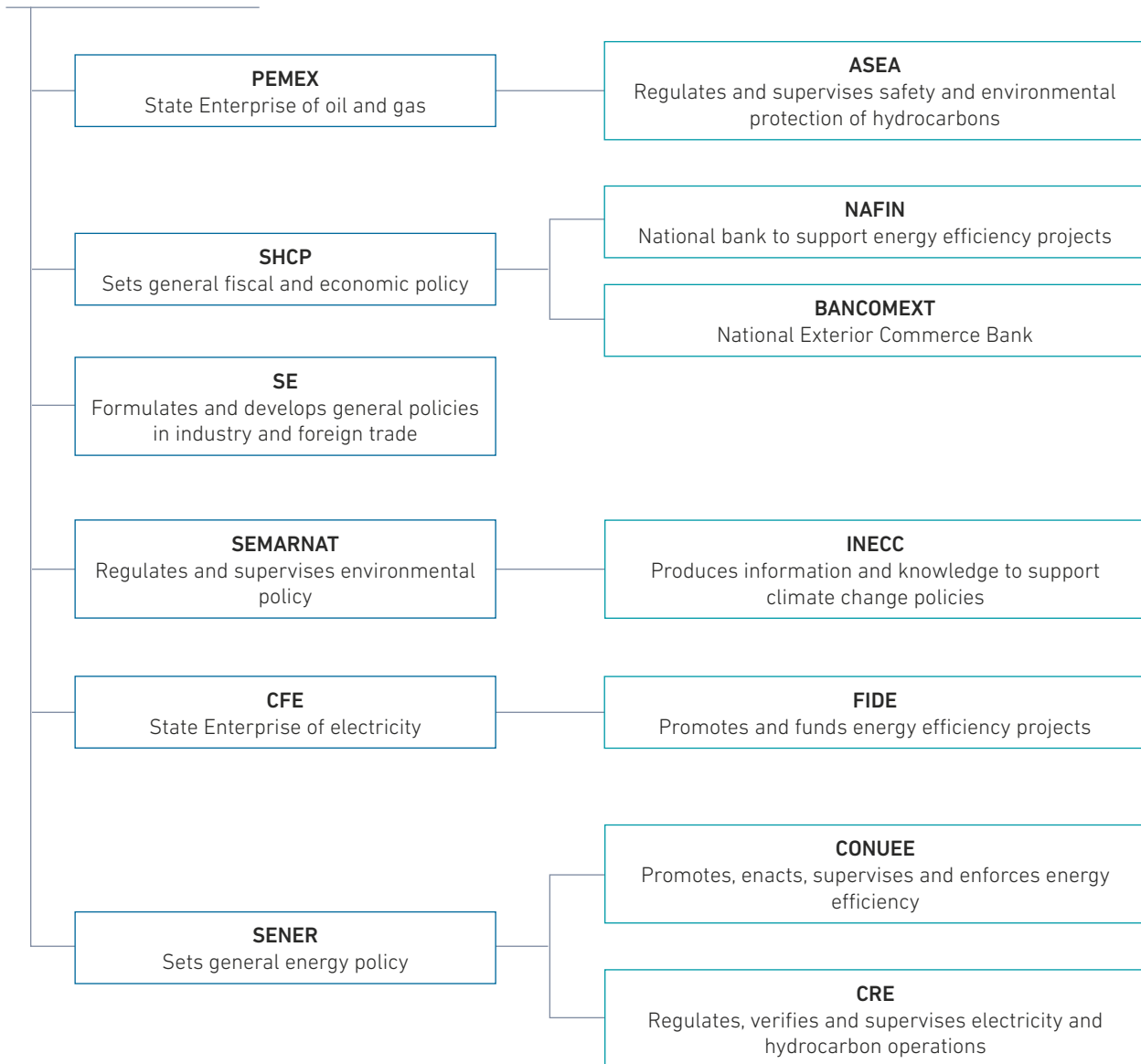


Figure 9. Mexican Government entities involved in the energy sector

From the private sector, there are several chambers and confederations of companies categorized by sector focus. In Mexico, the primary formal interlocutor with the government and the business representatives (associations from the industrial, commerce, financial and agriculture sectors) is the Business Coordinating Council (Consejo Coordinador Empresarial), which coordinates and identifies actions to develop strategic solutions in the industrial chambers. The following is a summary of the private sector organisations:

Considering the ESCO market, according to data from CONUEE, the firsts ESCOs in Mexico dates to over 15 years. Back in 2011, the Mexican Association of Energy Service Companies (AMESCO) was established with 10 relevant members of the Mexico's energy efficiency market. Currently, AMESCO transformed in Mexican Association of Energy Efficiency Companies (AMENEER), it includes companies with a wider scope, dedicated to install energy monitoring and control systems in commercial, residential, industrial and governmental buildings. Also, AMENEER promotes, disseminates and negotiates energy efficiency projects as part of its activities.

TABLE 7. Summary of private sector organisations part of the Business Coordinating Council

BUSINESS COORDINATING COUNCIL	COORDINATES AND IDENTIFIES ACTIONS TO DEVELOP STRATEGIC SOLUTIONS IN THE INDUSTRIAL CHAMBERS
Confederation of Industrial Chambers of Mexico (CONCAMIN)	<p>A business representation body of the different industrial sectors, which serves as an organisation of consultation and collaboration of the State. Integrates 46 national chambers, 14 regional chambers, 3 generic chambers and 46 associations of the different productive sectors that exists in the country. Has relationship with the three levels of government in Mexico.</p> <p>Proposes guidelines that promote efficiency, competitiveness and economic profitability in the national industry.</p>
Employers Confederation of the Mexican Republic (COPARMEX)	<p>Voluntary membership business organization. Consists of a network of 65 business centres, 14 federations and delegations around the country.</p> <p>Supports Mexican entrepreneurs; due to this, its members integrate 30% of country GDP.</p>
Confederation of the National Chambers of Commerce, Services and Tourism (Concanaco - Servytur)	<p>Public institution that coordinates and represents the local chambers of commerce before the Federal Government.</p> <p>Promotes trade, service and tourism activities at national and international level the supporting competitiveness and efficiency.</p>
Business Council for Sustainable Development (CESPEDES)	<p>Aim to create awareness among business leaders in energy and climate change; sustainable development; climate and environmental public policy; inclusive business, corporate social responsibility, among others.</p> <p>Proposes public policies on sustainability with a business vision.</p>

SME programmes implemented by Mexican institutions in cooperation with international organizations

2015 – 2017

CONUEE in collaboration with PTB developed the programme named “**Introduction of Energy Efficiency and Energy Management Systems in SMEs in Mexico**”

OBJECTIVES

1. Energy efficiency practices adoption through training to small and medium enterprises (SME)
2. Implement an Energy Management System (SGEn) in each of the participating companies

TARGETS

- Provide training at least two people per company
- Participants backing through advice and continuous support by technical consultants
- Develop a basic energy audit to companies
- Support of the opportunities for improvement by its structuring and quantification
- Technical support to companies in their first internal energy audit for their energy management system
- Provide a written recognition of their participation as an individual and company level

RESULTS

The project obtained a 57.7 GWh/annual energy savings equivalent to an economic saving of \$ 5,659,2421 pesos

2013 – 2017

SENER and FIDE in collaboration with GIZ developed the **NAMA in the Mexican Small and Medium Enterprises (SME) Sector**

OBJECTIVES

The NAMA seeks to introduce a variety of energy efficiency solutions in the tariff 2 and 3 electricity consumers (around 13,400 GWh/yr of electricity). NAMA SME MX has four stages to improve energy efficiency in SMEs as a contribution to a Low Carbon economy

NAMA SME Concept design

NAMA SME MRV

NAMA SME Financing

NAMA SME Pilot

TARGET

Financial cooperation will be provided to set up a guarantee fund (EUR 7 m) as well as a small-scale grant subsidy scheme (EUR 2.5 m) to finance EE measures in SMEs. A leveraging effect of at least EUR 70 m of private capital is expected for clean technology financing

2015 - 2018

CONUEE and collaboration with GIZ and PTB carry out the project **Energy Management System Learning Networks**.

OBJECTIVES

Implement an Energy Management System (SGEn) between CONUEE and the participants of the program, in accordance with the international standard ISO 50001, and prepare them for the standard's certification. This will be possible by the experiences exchange among them, as well as the provision of professional assistance and advice. The efforts by GIZ and PTB to implement SGEn in the Mexican industrial sector help to support companies in the capacity building for the SGEn implementation

TARGET

In the first phase, there were plants from 11 companies that have made significant progress and have expressed their interest in continuing to work together. It is expected that the project will support SGEn in 44 industrial plants around Mexico

2018

CONUEE in collaboration with PTB developed the programme named "**Introduction of Energy Efficiency and Energy Management Systems in SMEs in Mexico**"

OBJECTIVES

The Energy Efficiency Roadmap presents sectoral activities that must be completed to support each public policy action on energy efficiency that contributes to achieving the national targets. This roadmap must be in a continuous process of improvement, to strengthen the implementation processes, development and monitoring of public policies on energy efficiency in the country. These have three sections very well defined: Time Horizon, Actors and Elements and Resources. Every sector has several actions in terms of:

Public policy and regulations

Institutions

Capacity building

Market and financing

Research, development and innovation

TARGET

CONUEE is also developing the Energy Efficiency Industrial Roadmap: Industrial sector has 13 actions to be carried out in a short, medium and large period of time (2017 – 2030). These actions are shown in Table 8

TABLE 8. Main lines of actions considered in the Energy Efficiency Roadmap

PUBLIC POLICY AND REGULATIONS	
ACTIONS	Period
Unify criteria to request environmental and energy information for large industry	2017-2020
Strengthen fiscal policy with criteria of energy efficiency and clean energy	2019-2024
Simplify regulation to scout cogeneration and clean energy potentials	2017-2020
Standardized environmental regulation and energy performance with business partners	2019-2025
Develop incentive programs, accreditations and recognitions to promote Energy Management Systems (SGEn)	2017-2030
Strengthen and disseminate the energy efficiency and clean energy programs in MSMEs	2019-2030
INSTITUTIONS	
ACTIONS	Period
Strengthen the programs associated with international certifications in terms of energy efficiency and environmental protection applied to the industry	2018-2030
Strengthen the Energy Service Companies (ESCO) schemes for industrial, public and private sectors	2017-2025
CAPACITY BUILDING AND HUMAN RESOURCES	
ACTIONS	Period
Establish nationwide capacity programs for the SGEn implementation and certification	2017-2018
Establish ongoing training programs for management and support staff to implement energy efficiency and renewable energy programs in the industrial sector	2017-2018
MARKET AND FINANCING	
ACTIONS	Period
Establish programs for acquisition of efficient technology that reduces environmental impact, and the implementation of SGEn in industries	2017-2018
Develop market mechanisms to boost energy efficiency	2018-2025
RESEARCH, DEVELOPMENT AND INNOVATION.	
ACTIONS	Period
Develop and strengthen research capabilities related to the processes of the national industry	2018-2050

What solutions can address the remaining barriers?

The diagnostic work identified the following barriers limiting the development of energy efficiency in the industrial sector of Mexico, ranked by importance:

HIGH

- **Lack of energy saving mandatory actions** limits the institutions efforts to improve EE
- **Lack of trust** in technologies, technology suppliers and project implementers
- **Lack of knowledge** into the banks to generate EE credits to users

MEDIUM

- **Lack of awareness** to disseminate the EE national programmes and best practices
- **Perception of efficient technologies high cost** to implement projects as a first phase in terms to improve energy consumption
- **Lack of finance and incentive schemes** limits to accelerate the EE implementation projects

LOW

























- **Insufficient inter-institutional coordination** generates mistrust and annoyance between the industry sector to attend different requirements of each institution

Considering there is no single solution to all the barriers, packages of interventions would be required. Suggested interventions are shown in Table 9.

TABLE 9. Suggested interventions to tackle barriers for EE






BARRIER	SOLUTION
Insufficient inter-institutional coordination	Secure high-level government engagement and commitment from ministries to revise and align drivers, assessing what changes can realistically be made and verify that adequate regulations are in place
Lack of energy saving mandatory actions	<p>Help create a "white certificate" scheme</p> <p>Support action on Voluntary Agreements with top companies in key sectors</p> <p>Identify what kind of energy the government wants to reduce in order to create mandatory efficiency targets throughout sectors and/or incentives for players to achieve such targets</p> <p>Where relevant import tariffs on EE equipment should be reduced or eliminated to ensure Mexican companies face no barriers compared to their foreign competitors</p>
Lack of awareness	<p>Strengthen the National Program for Energy Management Systems</p> <p>Increase awareness and create capacity within SMEs to act upon energy efficiency opportunities</p> <p>Create an accreditation mechanism for energy consultants to increase trust in technologies and energy efficiency benefits</p>
Energy efficiency technologies high cost	Improve fiscal incentive rates to generate better relationship between government and private sector
Lack of finance and incentive schemes	<p>Support FIDE Eco-Credito programme and support commercial banks in providing greater access to finance for EE</p> <p>Disseminate green finance information through workshops with the Industrial chambers</p> <p>Revenue structure improvement via energy subsidies elimination and carbon tax</p>

As part of this study, selected activities/recommendations for each Pillar were identified and assessed, bringing the following results:

CATEGORY	Recommendation	Total	Additionality	Doability	Impact
 Pillar 1 POLICY	In-depth study to design and develops a white certificate scheme in Mexico				
 Pillar 2 CAPACITY BUILDING	Expand the voluntary agreements scheme set up by Denmark				
	Strengthening of human resources for an energy certification scheme for Energy Auditors and Energy Managers				
 Pillar 3 PIPELINE CREATION	Knowledge sharing and data provision including benchmarking				
 Pillar 4 FINANCE	Identification of opportunities for expansion of EE finance schemes				

Using this structured Diagnostic approach and based on consultations with SENER and CONUEE it was agreed to focus on the capacity building pillar: “Strengthening of human resources for an energy certification scheme for Energy Auditors and Energy Managers” due to its features of Additionality, Doability and Impact.

Key

	Low
	Medium-Low
	Medium
	Medium-High
	High

ADDITIONALITY / High	DOABILITY / High	IMPACT /Medium-High
The Accelerator can support the Mexican government in adapting international certification schemes to its needs and run initial training using a “train the trainers” approach.	Both CONUEE and SENER are highly supportive of this proposal. UNIDO and Carbon Trust have extensive experience designing and implementing certification schemes and delivering training.	Lack of skills is a crucial barrier for the industrial energy efficiency market in Mexico so the certification scheme could have a transformational impact in the long term. Short term impact would depend on how rapidly companies would be willing to train their energy managers to implement better management practices.

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