Preparatory Briefing on Mexico

Project name	Supporting international cluster and business network cooperation through the further development of the European Cluster Collaboration Platform
Project acronym	ECCP
Deliverable title and number	D 3.2. (3) – Preparatory Briefing on Mexico
Related work package	WP3
Deliverable lead, and partners involved	SPI
Reviewed by	inno TSD
Contractual delivery date	M12
Actual delivery date	M15– December 2016 (Updated: March 2019)
Start date of project	September, 23rd 2015
Duration	2 years
Document version	V2.0

Abstract: The preparatory briefing on Mexico is the result of the collection of relevant cluster information in the country, including business and sector trends, cluster policies and programmes, as well as a cluster mapping. It concentrates on Mexican clusters in four relevant industrial sectors. This document is intended to provide a good overview of the country's opportunities for European cluster organisations and SMEs.

Table of contents

1. Objective of the report 3
2. The economy of Mexico: focus on sectoral trends 3
2.1 Overview 3
2.2 Opportunities for Europe – investment, trade and Science, Technology & Innovation cooperation 4
2.3 Sectoral strengths 7
3. Cluster community in Mexico 14
3.1 Cluster mapping 14
3.2 Clusters in automotive, aerospace, renewable energy and ICT 16
4. Cluster policies and programmes in Mexico 25
4.1 The cluster policy of Mexico 25
4.2 Automotive policies and programmes 26
4.3 Aerospace policies and programmes 28
4.4 Renewable Energy policies and programmes 29
4.5 ICT policy and programmes 30
5. Conclusion 31
6. Annex 33

Table of figures

Figure 1 – Annual GDP Growth (2000-2017) in Mexico 5
FIGURE 2 – MAIN AEROSPACE CLUSTERS IN MEXICO- BY STATE 19

Table of tables

Table 1 - Industry and Sectorial priorities for trade and Investment 14
Table 2 - Mexican clusters with ECEI's quality labelling 15
Table 3 - Automotive cluster's main subsectors and locations 16
Table 4 - Top locations of Mexico's Renewable Energy projects 21
Table 5 - ICT Clusters 23
Table 6 – Formally organised clusters by state 33
Table 7 – Examples of EU-Mexico cooperation programmes and projects 36

1. Objective of the report

The aim of this Preparatory Briefing is to provide up to date information on the cluster landscape in Mexico in order to support European cluster organisations and their SME members explore the potential for collaboration and market opportunities. More specifically, this document provides an overview of the country's economy and sectoral trends/strengths where EU and Mexican clusters can cooperate. In addition, it outlines the existing cluster community, the cluster policies, local support to clusters and the support programmes in the selected key areas, including their historical development and internationalisation activity when appropriate.

A complementary report provides an overview on the existing EU-Mexico cluster cooperation, present related good practices/success stories and opportunities for future exchange, including recommendations for an EU-Mexico cluster policy dialogue (non-public information).

2. The economy of Mexico: focus on sectoral trends

2.1 Overview

The Mexican economy is the second largest in Latin America, growing at a moderate annual growth rate of around 2% of the Gross Domestic Product (GDP)[1]. In 2017, Mexico's economy was the 11th largest in the world; however, it remains vulnerable to the uncertainty arising from the ongoing North American Free Trade Agreement (NAFTA) renegotiations[2].

In 1997, Mexico signed an Economic Partnership, Political Coordination and Cooperation Agreement with the EU, which entered into force in 2000. However, in April 2018, the EU and Mexico reached an 'agreement in principle' on the trade part of a modernised EU-Mexico Global Agreement, which will replace the previous agreement[3].

In 2017, the EU was Mexico's second largest export market after the USA. Moreover, the EU was Mexico's third-largest source of imports in 2017, after the USA and China. The EU's key exports to Mexico include machinery and appliances (25.2%), transport equipment (23.5%), mineral products (18%), optical and photographic instruments (12%), and products of the chemical or allied industries (3.6%). On the other hand, the EU's key imports from Mexico include machinery and appliances (35.9%), transport equipment (16.5%), products of the chemical or allied industries (14.3%), base metals and articles thereof (7.5%), and plastics, rubber and articles thereof (4.8%)[4]. In terms of

[1] Information about Mexico's economy at: World Bank: http://www.worldbank.org/en/country/mexico/overview#1
[2] The World Factbook, Mexico : www.cia.gov/llibrary/publications/the-world-factbook/geos/mx.html
[3] EU-Mexico Trade Agreement : http://ec.europa.eu/trade/policy/in-focus/eu-mexico-trade-agreement/
[4] European Union, Trade in goods with Mexico
https://webgate.ec.europa.eu/isdb_results/factsheets/country/details_mexico_en.pdf

services, EU imports from Mexico are dominated by travel services and transport services. EU services exports to Mexico consist mainly of transport services, and telecommunications, computer and information services[5]. Regarding the EU-Mexico foreign direct investment (FDI) balance, in 2016 the EU invested €137.3 billion in Mexico; while Mexico invested €42.3 billion in the EU.

In 1994, Mexico, Canada and the United States of America (USA) established NAFTA with the aim of promoting a gradual elimination of tariffs and import quotas, as well as removing barriers to free trade among the three countries. In addition, Mexico is an associate country of the Southern Common Market (Mercosur), a South American trade bloc composed of Argentina, Brazil, Paraguay and Uruguay, as well as a member of the Organisation for Economic Co-operation and Development (OECD) and the G20[6].

2.2 Opportunities for Europe – investment, trade and Science, Technology & Innovation cooperation

According to the 2018 Global Competitiveness Index, Mexico is ranked 46th out of a total of 140 countries[7]. Mexico's GDP Annual Growth has shown several fluctuations over the last 17 years (minimum -5.2% in 2009 and maximum 5.1% in 2010). Since 2013, Mexico's annual GDP growth has been below expectations and is forecasted to remain at an average of 2% per year due to the reduction of oil production, weak oil prices, structural issues such as low productivity and high inequality, a large informal sector employing over half of the workforce, and high corruption levels[8]. Moreover, policy uncertainty related to NAFTA's renegotiations is also expected to contribute to Mexico's moderate annual growth (Figure 1)[9].

[5] Trade relation EU- Mexico: http://ec.europa.eu/trade/policy/countries-and-regions/countries/mexico/
[6] https://ec.europa.eu/research/iscp/pdf/policy/mx_roadmap_2017.pdf
[7] Global Competitiveness Index 4.0 2018 edition: http://reports.weforum.org/pdf/gci4-2018/WEF_GCI4_2018_Profile_MEX.pdf
[8] The World Factbook, Mexico: www.cia.gov/llibrary/publications/the-world-factbook/geos/mx.html
[9] World Bank, Source: World Economic Forum: https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=MX&view=chart

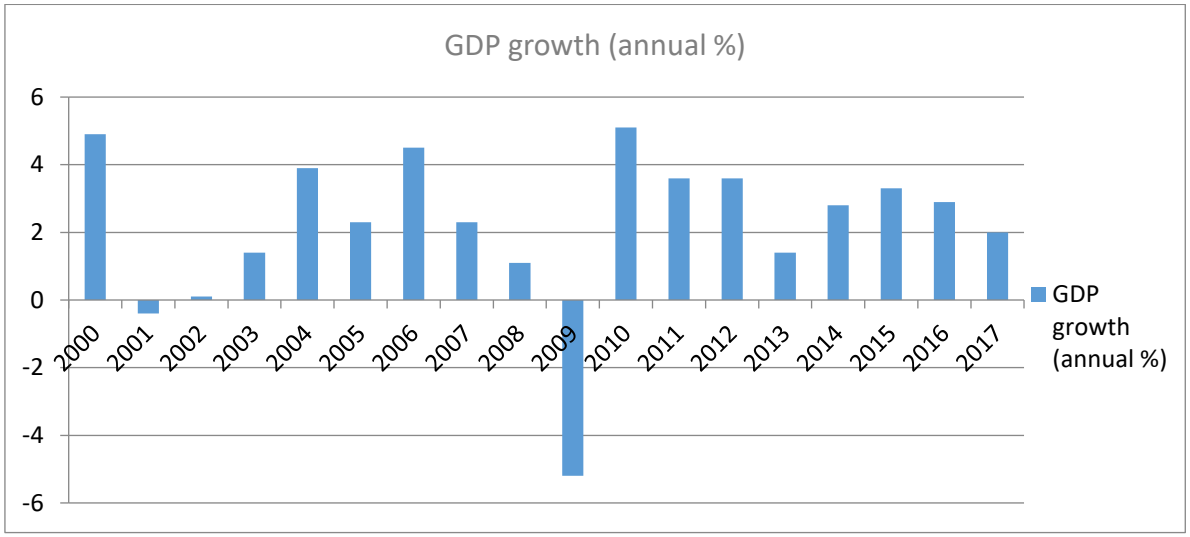

FIGURE 1 – ANNUAL GDP GROWTH (2000-2017) IN MEXICO[10]

In 2017, Mexico had a GDP per capita of €7,800; however, the income distribution remains highly unequal. In addition, private consumption continues to be significantly high despite the fall in real wages associated with an inflationary gap experienced during 2017[11].

In 2016, Mexico was the largest manufacturing exporter in Latin America. In 2017, the 12 main products exported by Mexico were light motor vehicles, auto parts and accessories, transportation vehicles, computers and computer parts, petroleum oils and bituminous minerals, telephone and telephone parts, television sets, electricity conductive materials, medical and veterinary equipment, tractors, seats and seat parts, and refrigeration units[12].

According to the A.T. Kearney's FDI Confidence Index 2018, Mexico is currently the 17th most attractive country for investors. According to this index, the Mexican government has established conditions to improve the investment environment, such as lifting price controls on fuel and privatising its hydrocarbon sector, which resulted in major deals[13]. Moreover, the World Bank Doing Business 2018 classifies Mexico as the 49th most favourable country to do business[14]. In fact, it takes only six days and six procedures for any investor to open a business in Mexico[15].

Mexico had a dedicated agency, called ProMexico, within the Ministry of Economy to support companies aiming at entering the Mexican market. This agency was an initial contact point for the ECCP and possible European cluster organisations. In 2018, ProMexico was discontinued by the

[10] World Bank, Source: World Economic Forum: https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=MX&view=chart
[11] Information about Mexico's economy at: World Bank: www.worldbank.org/en/country/mexico/overview#1
[12] ProMexico Trade and Investment: www.promexico.mx/en/mx/por-que-mexico
[13] The 2018 A.T. Kearney Foreign Direct Investment Confidence Index https://www.atkearney.com/gbpc/foreign-direct-investment-confidence-index
[14] World Bank Doing Business 2018 Report: www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB2018-Full-Report.pdf
[15] ProMexico www.promexico.mx/es/mx/razones-invertir

President Andrés Obrador as part of a strict austerity plan to reduce bureaucracy and promote economic savings. ProMexico's discontinuation involves the closure of the central offices in Mexico City, as well as 28 offices in different Mexican regions, and 46 representative offices around the world in cities such as London and Madrid[16]. Therefore, due to the closure of ProMexico's offices, the promotion of international trade and investment will be conducted by the Secretary for Economy, as well as by the Attaché of Economic Affairs of Mexico in the embassies of each country[17].

In 1997, Mexico signed a Free Trade Agreement (FTA) with the EU, which liberalised trade on all industrial and some agricultural goods, and improved market access conditions. The FTA has eliminated or reduced tariffs on goods and, as a result, businesses from the EU and Mexico do not have to pay any tariffs to sell their products in the Mexican or European markets, respectively. Since the establishment of the FTA, the average yearly investment in Mexico by the EU has tripled, accounting for about €140 billion from 2000 to 2015[18].

Despite the FTA, not all products are tariff free. Currently, 62% of agricultural goods are fully free of tariffs. These include the EU exports of alcoholic beverages and olive oil to Mexico and the Mexican exports of tropical fruit and vegetables to the EU. The FTA also covers services including financial, telecommunications, distribution, energy, tourism and environment services[19].

In April 2018, the EU and Mexico reached a new agreement on trade, part of a broader EU-Mexico Global Agreement. According to the new agreement, all trade in goods between the EU and Mexico will be duty-free, including the agricultural sector. Simpler customs procedures will further benefit the EU's industry, including sectors such as pharmaceuticals, machinery and transport equipment. Thus, the new agreement is expected to: (i) decrease high Mexican tariffs on European food and drinks, (ii) allow EU firms to sell more services to Mexico, and (iii) protect the rights of workers as well as the environment. This agreement builds on the aim of cooperating on issues broader than trade, including political issues, climate change and human rights[20].

Regarding research and development (R&D), Mexico has one of the lowest levels of public investment in Latin America. The Mexican Government is the main source of R&D funding since the private sector has a limited participation as a funding and performing actor in the R&D and innovation ecosystem. In this context, the Mexican Government has been working on a new public procurement for innovation policy, technology transfer, and commercialisation of research results in order to facilitate the creation of high-technology start-ups and foster companies' innovation[21].

---

[16] Semana, Proméxico cierra sus oficinas en el mundo, incluida la de Colombia, www.semana.com/mundo/articulo/promexico-cierra-sus-oficinas-en-el-mundo-incluida-la-de-colombia/597170

[17] LR, El cierre de las agencias de ProMéxico plantea la posibilidad de oficinas compartidas, www.larepublica.co/globoeconomia/el-cierre-de-las-agencias-de-promexico-plantea-la-posibilidad-de-oficinas-compartidas-2838346

[18] EU-Mexico Trade Relations http://eeas.europa.eu/delegations/mexico/eu_mexico/trade_relation/index_en.htm

[19] EU-Mexico FTA http://eeas.europa.eu/delegations/mexico/eu_mexico/trade_relation/free_trade/index_en.htm

[20] EU-Mexico Global Agreement : http://trade.ec.europa.eu/doclib/press/index.cfm?id=1830

[21] Roadmap for EU - Mexico S&T cooperation https://ec.europa.eu/research/iscp/pdf/policy/mx_roadmap_2017.pdf

The National Development Plan (PECiTI 2014-2018) aims to make knowledge and innovation the key instruments for sustainable economic growth, which should promote human development, social justice, democracy, and peace. Thus, the PECiTI aims to increase a wide range of indicators, including the contribution from the private sector, the number of researchers per 1,000 employees, the number of scientific papers per 1 million inhabitants, and the number of enterprises with innovation activities[22].

Furthermore, the National Council of Science and Technology (CONACYT) promotes an Incentive Programme for Innovation that supports Mexican companies which invest in research, technology development and innovation focused on creating new products, processes or services[23]. These programmes include three modalities:

- INNOVAPYME: Technologic innovation for SMEs
- INNOVATEC: Technologic Innovation for large companies
- PROINNOVA: Networking projects focused on innovation

In terms of science and technology cooperation, an agreement for scientific and technological cooperation between the EU and Mexico has been in force since 2005 (it was renewed for another five years in 2010 and again in 2015). The agreement promotes bilateral cooperation in fields of common interest in science and technology such as research on environment and climate, transport, non-nuclear energy, biotechnology, aeronautics and space, and science and technology policy[24].

Furthermore, during the 2016 EU-Mexico Joint Science and Technology Cooperation Committee (JSTCC) meeting the EU and Mexico reinforced their will to continue designing comparable policies, instruments and actions to tackle shared challenges. Thus, the EU and Mexico reaffirmed their commitment to improve the framework conditions for researchers and innovators to work together in areas of shared interest[25].

Under the EU's Framework Programme Horizon 2020, until October 2017, Mexican entities have participated 49 times and signed 30 grants of collaboration, Marie Sklodowska-Curie Actions (MSCA) and European Research Council (ERC) actions. Regarding collaborative actions of Horizon 2020, Mexican applicants have been involved 132 times in 94 eligible proposals. Moreover, Mexican applicants have been involved 146 times in 124 MSCA eligible proposals[26].

2.3 Sectoral strengths

Mexico is considered a service providing country with 50.9% of the country's GDP generated by the service sector[27]. Between 1999 and 2017, the accrued FDI per sector was primarily in the

[22] Roadmap for EU - Mexico S&T cooperation https://ec.europa.eu/research/iscp/pdf/policy/mx_roadmap_2017.pdf
[23] Incentive Programme for Innovation http://conacyt.gob.mx/index.php/fondos-y-apoyos/programa-de-estimulos-a-la-innovacion
[24] EU-Mexico International Cooperation https://ec.europa.eu/research/iscp/index.cfm?pg=mexico
[25] Roadmap for EU - Mexico S&T cooperation https://ec.europa.eu/research/iscp/pdf/policy/mx_roadmap_2017.pdf
[26] Roadmap for EU - Mexico S&T cooperation https://ec.europa.eu/research/iscp/pdf/policy/mx_roadmap_2017.pdf
[27] ProMéxico with data from INEGI (slide 29) www.promexico.mx/en/mx/por-que-mexico

manufacturing industries (49%) followed by the financial and insurance services (14%), trade (8%), mining (5%), and information on mass media (4%) industries[28].

Several industrial sectors are well developed and have a strong market potential in Mexico. Among those, there are a few sectors of common interest for the EU and Mexico, such as automotive, aerospace, renewable energies, and information and communications technology (ICT). In this context, there are six first and second generation European Strategic Cluster Partnerships for Going International (ESCP-4i) interested in establishing cooperation activities with Mexico in the previously mentioned sectors.

First generation ESCP-4i:

- Activities and Businesses from Real Opportunities for Aerospace Developments (EACP ABROAD) – Aerospace Vehicles and Defence;
- Promoting European Rail Excellence outside EU (PERES) – Automotive sector;
- Energy in Water (EnW) – Renewable energies; and
- Renewable Energy Internationalisation ESCP project for European SMEs (REINA PLUS) - Renewable energies.

Second generation ESCP-4i:

- European Digital Industry Alliance (DIA) - ICT; and
- Geo-Energy for the XXIst Century (GEO-ENERGY EUROPE) - Renewable energies.

Automotive sector

The automotive sector is a pillar of Mexico's economy. Mexico is the seventh leading world producer of light-vehicles. In 2016, the automotive sector accounted for 3% of Mexico's total GDP and 18% of its manufacturing GDP[29].

In 2016, Mexico's automotive industry produced 3.47 million vehicles, which represented a 2% increase compared to the previous year. More than 80% of the automotive production in Mexico is designed for exports, with a focus on the USA, which makes it dependent on international demand. Thus in 2016, Mexico exported 2.77 million vehicles, which represented a 0.3% increase compared to 2015. However, the Mexican Government has more ambitious goals for the country's automotive sector. In 2020, Mexico is expected to produce 5 million vehicles, out of which 2 million will be for the domestic market.

Mexico's automotive industry includes 23 light-vehicle and 15 heavy-vehicle production plants across the states of Baja California, Sonora, Chihuahua, Nuevo Leon, Aguascalientes, San Luis Potosi, Guanajuato, Jalisco, Queretaro, Morelos, State of Mexico, Puebla, Hidalgo and Veracruz. Well-known companies such as General Motors, Ford, Chrysler, Volkswagen, Nissan, Honda, BMW, Toyota, Volvo Mercedes-Benz, Kia and Audi are located across 24 production complexes. Moreover, the recent arrival

[28] ProMéxico with data from the Secretariat of Economy www.promexico.mx/en/mx/por-que-mexico

[29] Mexico Automotive Review 2017 https://issuu.com/mexicobusinesspublishing/docs/mar_2017_complete_book_issuu_-_new

of Audi and Kia to Mexico has helped the country to climb international rankings in terms of production.

The Mexican automotive industry has gradually become more advanced and oriented towards technology and innovation. The recognised quality of Mexico's automotive manufacturing sector has enabled several original equipment manufacturers (OEMs) to choose Mexico as a unique manufacturing site for all their destinations. This provides a good industrial environment for luxury vehicles manufacturing, fostering Mexico's position as an exclusive location for OEMs[30].

In 2016, the Mexican Ministry of Economy defined the country's priorities for the automotive sector, which include boosting the image of the sector, ensuring international competitiveness and reducing Mexico's dependence on the USA market. The automotive industry's development is grounded on four pillars: (1) guarantee of a strong FTA network with 45 countries; (2) promotion of engineering and R&D activities; (3) development of a human capital-oriented strategy; and (4) implementation of the Energy Reform[31].

Aerospace sector

The aerospace sector plays a key role in Mexico's economy. Currently, Mexico's aerospace sector is the 14th largest aerospace sector in the world with approximately 330 aerospace companies and support entities registered in the country[32]. Mexico's aerospace GDP increased from approximately €711 million in 2013 to €1.1 billion in 2017, which represented a 54% growth. The value of Mexico's aerospace production has also increased from around €330 million in 2013 to €531.9 million in 2017, accounting for a 60.5% increase[33].

Between 2007 and 2017, the exports from Mexico's aerospace industry grew at an average annual rate of 11.2%. In 2017, Mexico's aerospace exports reached more than €6.8 billion[34]. Furthermore, Mexico is among the top destinations for aerospace FDI with approximately €2.6 billion inward investment over the last 10 years[35,36].

In 1965 the Mexican government established the In-bond or Maquiladora programme, which allows the importation of goods without paying import duties to assemble products that will be exported. This programme has attracted several aerospace companies to northern cities in order to decrease costs and take advantage of customs' procedures of the In-bond or Maquiladora operations. Thus, the

[30] Ibidem [27]

[31] Mexico Automotive Review 2017 https://issuu.com/mexicobusinesspublishing/docs/mar_2017_complete_book_issuu_-_new

[32] Mexican Aerospace Industry: Flying to new heights www.promexico.gob.mx/documentos/revista-negocios/pdf/mar-abr-2017.pdf

[33] An Overview of Aviation and Aerospace in the Peña Nieto Administration – Part 3 of 3 www.aerospacemx.com/an-overview-of-aviation-and-aerospace-in-the-pena-nieto-administration-part-3-of-3/

[34] An Overview of Aviation and Aerospace in the Peña Nieto Administration – Part 3 of 3 www.aerospacemx.com/an-overview-of-aviation-and-aerospace-in-the-pena-nieto-administration-part-3-of-3/

[35] Growth and Opportunity Areas in the Mexican Aerospace Sector www.aerospacemx.com/growth-and-opportunity-areas-in-the-mexican-aerospace-sector/

[36] The aerospace industry in Mexico is located in clusters, https://borderassembly.com/aerospace-industry-in-mexico/

geographical concentration of firms in Mexico's northern cities has led to the establishment of industrial parks, which have evolved into diversified aerospace hubs, or clusters[37, 38].

There are five aerospace hubs located in the states of Baja California (Tijuana-Mexicali), Sonora, Chihuahua, Queretaro, and Nuevo León. Baja California is home to Mexico's largest aerospace hub, with 110 aerospace firms generating more than 35,000 direct jobs. In recent years, Mexico's aerospace hubs have been attracting new aerospace players due their logistical advantages, labor, and government incentives[39]. The number of aerospace companies in Mexico has increase from 112 companies in 2009 to 330 in 2017.

The aviation subsector has been playing a key role in Mexico's aerospace industry. The aerospace growth has been stimulated by the arrival of the Canadian firm Bombardier to the State of Queretaro in 2004, which encouraged many international firms to establish themselves in Mexico such as Safran Group, General Electric (GE), Honeywell and Eurocopter. Therefore, the Mexican commercial aviation and related demand for maintenance repair overhaul (MRO) has been stimulated by a wide range of factors, including the expansion of low-cost carriers, the approval of the Delta-Aeromexico partnership in 2016, and the increased use of Mexico as a regional hub. The sector is mainly composed of manufacturers, MRO facilities, technical schools, research centres, universities, and related service providers. Thus, 72.2% of all firms are manufacturers, 13.2% are firms related to design and engineering, 11.2% are in MRO services, and 3.4% are other support entities[40].

Mexico has dedicated its efforts to improve technological sophistication of exports, infrastructures, as well as specialising human capital. All of these conditions have facilitated the signing of cooperation agreements in the aerospace sector. In 2007, Mexico signed the Bilateral Aviation Safety Agreement with the US Federal Aviation Administration[41]. As a result, Mexican aerospace companies certify their manufacturing processes to comply with industry standards such as ISO-9001, AS9100 and NADCAP[42].

Furthermore, the Mexican aerospace sector has been investing in R&D. Thus, research centers have been created to support R&D activities related to turbines, motors, complex systems, software, and engineering applications in manufacturing processes. In 2018, the Center of Aeronautical Technologies of Querétaro (CENTA) was launched with CONACYT's support. The Center aims to provide services for the aerospace industry and support new projects led by SMEs[43].

The Mexican Government is highly committed to support the country's aerospace sector. Hence, the Government has launched several programmes to create employment opportunities, including business incentives, new workforce training programmes, and new universities. This package of

[37] Mexico - B. Aerospace www.export.gov/article?id=Mexico-Aerospace
[38] NAFTA and the Maquiladora Program http://teamnafta.com/manufacturing-resources-pages/2016/4/18/nafta-and-the-maquiladora-program
[39] Mexico - B. Aerospace www.export.gov/article?id=Mexico-Aerospace
[40] Mexico - B. Aerospace www.export.gov/article?id=Mexico-Aerospace
[41] Bilateral Aviation Safety Agreement with the Federal Aviation Administration www.faa.gov/aircraft/air_cert/international/bilateral_agreements/baa_basa_listing/media/Mexico_BASA_EA.pdf
[42] Ibidem [27]
[43] Mexico - B. Aerospace www.export.gov/article?id=Mexico-Aerospace

support measures is called the "three helixes" since it is grounded on the close collaboration between the private sector, government, and academia.

Renewable Energy sector

Mexico has an enormous potential in the field of renewable resources. In recent years, the Mexican Government has been highly committed to tackle climate change and reduce energy costs, which has contributed to the growth of Mexico's renewable energy sector[44]. Currently, Mexico is the second largest power market in Latin America with a planned investment of around €96.6 billion until 2030 in the generation, transmission and distribution subsectors[45].

Until 2013, Mexico's generation, transmission, distribution and supply of electricity were all exclusively managed by a state-owned utility named Comisión Federal de Electricidad (CFE). Thus, the energy sector attracted little foreign investment and had only a few operational renewable energy projects. In 2014, the Ley de la Industria Eléctrica (Electricity Industry Law) implemented a package of reforms and started the transformation of the energy market, which changed from a monopoly framework to a liberalised generation market with more opportunities for private companies. In this context, renewable energy has become a key part of the energy reform[46].

Mexico's General Climate Change Law established the goals of reducing greenhouse gas emissions by 30% until 2020, and increasing the electricity generated from clean energy sources to 35% by 2024 and 50% by 2050. Thus, this law is expected to facilitate the development of renewable energy projects[47]. In 2015, Mexico was among the world's top 10 destinations for new clean energy investment, attracting approximately €3.5 billion[48].

In recent years, Mexico has been attracting numerous project developers and equipment suppliers. Moreover, several domestic companies have entered the local market with small-scale projects related to the development, manufacturing and selling of renewable equipment and/or have diversified their businesses towards the renewable energy sector[49]. Many recognised companies are also developing projects in the renewable energy field in Mexico such as Repsol, Alstom, Acciona and Sunpower[50]. Thus, between 2010 and 2016, Mexico announced approximately 72 FDI projects in the renewable energy industry. The main investor countries were Spain, USA and Germany[51].

Mexico's renewable energy capacity includes 23% of energy from hydropower, wind, geothermal, biomass, and solar energy. Currently, large-scale hydropower is the leading source of the country's

[44] Mexico - Q. Renewable Energy www.export.gov/article?id=Mexico-Renewable-Energy
[45] The big mexico renewable energy report - Awex Export
[46] The big mexico renewable energy report - Awex Export
[47] Mexico - Q. Renewable Energy www.export.gov/article?id=Mexico-Renewable-Energy
[48] Mexico's Renewable Energy Future www.wilsoncenter.org/sites/default/files/mexico_renewable_energy_future_0.pdf
[49] The Renewable Energy Industry in Mexico http://mim.promexico.gob.mx/swb/mim/Energias_renovables
[50] Renewable energy industry http://mim.promexico.gob.mx/work/models/mim/templates/JS/MIM/PerfilDelSector/EnergiasRenovables/Sector_ER_ING.pdf
[51] The Renewable Energy Industry in Mexico http://mim.promexico.gob.mx/swb/mim/Energias_renovables

renewable energy capacity, followed by wind energy. Mexico's installed capacity includes 17% of large-scale hydroelectric dams, 5% of winder power, 1% of geothermal energy, 1% biomass, and 0.1% of solar energy[52].

Mexico has a great potential to expand small, off-grid hydropower projects to bring electricity to isolated communities, mainly from the rivers of the Pacific Rim and the states of Veracruz, Oaxaca, and Chiapas. Thus, hydroelectricity in Mexico is expected to continue growing since the number of large hydroelectric dams and small and micro hydro projects is forecasted to increase[53].

In addition, wind power has been growing in Mexico. In 2015, Mexico was one of the world's 25 countries with more than 1,000 MW of installed wind power. The wind power is generated by more than 37 wind farms in states such as Oaxaca, Baja California, Chiapas, Jalisco, Tamaulipas, San Luis Potosí, and Nuevo León. Moreover, in 2017, Mexico accounted for around a €5.4 billion investment in solar energy, almost half of the total investment in the previous five years combined[54].

In 2015, the EU launched the Low Carbon Business Action (LCBA) in Mexico, which is a project that aims to contribute to the reduction of CO2 emissions in Mexico focusing on European SMEs technology transfer in the waste, water and energy efficiency management[55]. Between June 2015 and March 2019 technical Assistance has already been delivered to all selected cooperation partnership agreements.[56].

ICT sector

Mexico has become an important player in emerging markets for ICT. In recent years, Mexico's ICT sector has been growing steadily. In 2013, the Telecommunications Reform instituted internet access as a right of all citizens of Mexico. In 2017, Mexico had 79 million internet users, representing 67% of the population over the age of six. Thus, the increase of internet access has led to the growth of Mexico's digital economy[57].

In 2016, the IT industry represented 0.15% of the total GDP. In May 2018, the IT industry was the eighth largest contributor to Mexico's GDP and is forecasted to grow around 2% by 2019[58]. Between 2010 and 2016, Mexico's IT services and software sector represented a compound annual growth rate of 12%, with an estimated market value of around €9.9 billion[59].

Mexico's telecommunication sector is the second largest in Latin America in terms of subscriber numbers, accounting for 2.4% of the country's GDP in the third quarter of 2017. Furthermore, Mexico has been substantially investing in cloud analytics services. The demand for cloud-based solutions has been growing among SMEs due to the need of increasing competitiveness and aligning their IT

[52] Mexico's Renewable Energy Future www.wilsoncenter.org/sites/default/files/mexico_renewable_energy_future_0.pdf
[53] Mexico's Renewable Energy Future www.wilsoncenter.org/sites/default/files/mexico_renewable_energy_future_0.pdf
[54] Mexico's Renewable Energy Future www.wilsoncenter.org/sites/default/files/mexico_renewable_energy_future_0.pdf
[55] For more information about Low Carbon Business Action Mexico www.lowcarbon.mx
[56] Low Carbon Business Action (LCBA) in Mexico www.lowcarbon.mx/the-project/
[57] Mexico - L. Internet and IT Services www.export.gov/article?id=Mexico-Internet-and-IT-Services
[58] Robust infrastructure, tech parks and talent drive growth in Mexico's ICT sector https://oxfordbusinessgroup.com/overview/key-competitiveness-robust-infrastructure-tech-parks-and-talent-drive-growth
[59] The Report: Mexico 2018 https://oxfordbusinessgroup.com/mexico-2018/ict

capabilities with the ones from larger partners and buyers[60]. By 2019, this subsector is forecasted to have an average annual growth rate of 29%, representing a €604 million market. Mexico is also among the three most competitive mobile app markets in the American continent regarding the number of apps opened per user per month and the number of times an app is opened per user per month[61].

Mexico is home to approximately 4000 IT companies[62]. Between 2013 and 2017, companies from the USA, Germany, India, Spain, Ireland, and other countries have announced investments in Mexico for more than €1.3 billion on the IT and software sectors[63]. According to A.T. Kearney's Global Services Location Index 2017, Mexico ranks as the tenth best destination for IT and call centre providers due to its telecommunications infrastructure, large number of engineers and technicians, as well as increasing number of bilingual population.

Leading software development companies have been establishing operations in Mexico, such as American Microsoft, Oracle, IBM, Symantec, EMC, Hewlett Packard, Adobe, and the German SAP. Moreover, nine of the 15 best ranked outsourced services companies by the International Association of Outsourcing Professionals (IAOP) are present in Mexico: Accenture (Ireland), CBRE (United States), Cushman & Wakefield (United States), EPAM Systems (United States), HCL Technologies (India), ISS (Denmark), Jones Lang LaSalle (United States) and Teleperformance (France)[64].

In recent years, Mexico became home to 19 IT clusters and tech parks, which are located in 16 states and are composed of approximately 1000 companies. Mexico also has 30 industrial clusters in 20 states, which are mainly specialised in IT and business process outsourcing (BPO). Mexico's industrial clusters emerged due to the establishment of alliances between public and private sectors and academia, mainly in the country's central and northern regions. In addition, Mexico is home to around 700 registered development centres, which have been certified by international bodies such as the Capability Maturity Model Integration Institute[65].

Overall, Mexico's ICT sector presents several opportunities for businesses related with IT, especially for sectors that are intensifying their use of IT, including manufacturing, transportation, security, energy, retail, and financial services.

[60] Mexico - L. Internet and IT Services www.export.gov/article?id=Mexico-Internet-and-IT-Services
[61] Mexico - L. Internet and IT Services www.export.gov/article?id=Mexico-Internet-and-IT-Services
[62] Robust infrastructure, tech parks and talent drive growth in Mexico's ICT sector https://oxfordbusinessgroup.com/overview/key-competitiveness-robust-infrastructure-tech-parks-and-talent-drive-growth
[63] IT and Software Services in Mexico http://mim.promexico.gob.mx/swb/mim/Servicios_de_TI_y_software
[64] IT and Software Services in Mexico http://mim.promexico.gob.mx/swb/mim/Servicios_de_TI_y_software
[65] Robust infrastructure, tech parks and talent drive growth in Mexico's ICT sector https://oxfordbusinessgroup.com/overview/key-competitiveness-robust-infrastructure-tech-parks-and-talent-drive-growth

3. Cluster community in Mexico

3.1 Cluster mapping

Mexico has an important and well-established community of clusters. There are eight key priority industries for trade and investment in México: agroindustry, chemical and industrial supplies, creative industries, energy and environmental technologies, health, infrastructure and tourism, services, and transportation[66]. These priority industries include specific sectorial priorities. Table 1 provides an overview of the industrial and sectorial priorities for trade and investment.

TABLE 1 - INDUSTRY AND SECTORIAL PRIORITIES FOR TRADE AND INVESTMENT

Industry	Sector
Agroindustry	Processed Foods
Chemical and Industrial Supplies	Electric Home Appliances Electronics
Creative Industries	Design and Innovation
Energy and Environmental Technologies	Renewable Energy Natural Gas & Gas L.P. Oil and Petroleum
Health	Biotechnology Clinical Research Medical Devices
Infrastructure and Tourism	Health Tourism Mining
Services	Shared Services Centres and BPO Telecommunications Software & Information Technology
Transportation	Aerospace Automotive Auto parts

In a research paper developed by Igor Pecina about clusters and competitiveness[67], the author identifies two types of clusters in Mexico. The first one consists of a number of companies that cooperate with the aim of dealing with orders from large customers; these companies are also associated with supporting institutions. The second model consists of companies (equal status) concentrated in the same state that do not interact themselves, but interact with suppliers and support institutions.

Most of the clusters reviewed in this document implement a triple helix model (innovation clusters), in which members of public institutions, academic and business sectors cooperate to promote

[66] ProMéxico, www.promexico.gob.mx/en/mx/sectores Erreur ! Signet non défini.
[67] Clusters y competitividad (Igor Pecina) http://biblioteca.utec.edu.sv/siab/virtual/elibros_internet/55792.pdf

innovation in a specific sector. In Mexico, the triple helix model is a common approach to clusters since it allows the development of a broader range of activities and facilitates innovation.

Furthermore, the European Secretariat for Cluster Analysis (ESCA), which promotes cluster management excellence through benchmarking and quality labelling of clusters and cluster management organisations, has been mandated by the European Cluster Excellence Initiative (ECEI) to organise the assessment process. Currently, there are eight Mexican clusters with gold, silver and bronze labels for cluster management excellence. Table 2 provides information about the Mexican clusters with ECEI's quality labelling. Thus, according to Table 2 the Mexican clusters with ECEI's quality labelling are mainly focused on the ICT and transportation and mobility sectors, which indicates the strength of these sectors in Mexico.

TABLE 2 - MEXICAN CLUSTERS WITH ECEI'S QUALITY LABELLING

Label	Name	Sector	Label valid until
Gold Label[68]	CLAUT	Transportation and mobility	2019/06/23
	csoftmty - Consejo de Software de NuevoLeón	ICT	2019/12/31
Silver Label[69]	IJALTI - Instituto Jalisciense de Tecnologías de la Información	ICT	2021/02/15
	IT@Baja	ICT	2021/05/06
Bronze Label[70]	CLAUGTO	Transportation and mobility	2020/05/04
	Cluster de Integradores de Alta Tecnología A.C.	ICT	2019/06/17
	Monterrey Aerocluster	Aerospace and aviation	2019/05/03
	Polos de Innovacion Inteligencia y Talento A.C.	Production and engineering	2019/05/29

[68] Mexico : Quality audit: Gold Label of the European Cluster Excellence Initiative (ECEI) www.cluster-analysis.org/gold-label-new/?country=6bf487690ce6458c88e2aff0e44d27fb

[69] México : Quality audit: Silver Label of the European Cluster Excellence Initiative (ECEI) www.cluster-analysis.org/silver-label/?country=9c20853ad47a4b8e946f6cde09d790af

[70] México : Quality audit: Bronze Label of the European Cluster Excellence Initiative (ECEI) www.cluster-analysis.org/benchmarked-clusters/?country=eaab51b460664f70808b21e3180c4a45

3.2 Clusters in automotive, aerospace, renewable energy and ICT

Automotive clusters

Mexico has a large cluster community supporting the automotive sector throughout the entire value chain and involving a large number of suppliers. Currently, there are 31 automotive clusters in Mexico, which are mainly specialised in three categories: light vehicles and their engines, heavy vehicles and their engines, and centres of research and development[71]. Most of the Mexican automotive clusters are based along the border with the USA, in the States of Baja California, Sonora, Chihuahua or Nuevo León, but there are also automotive clusters in the states of Guanajuato, Puebla and México City[72]. Table 3 provides an overview of the automotive clusters' main subsectors and locations[73].

TABLE 3 - AUTOMOTIVE CLUSTER'S MAIN SUBSECTORS AND LOCATIONS

Main subsectors	Top locations
Light vehicles and their Engines	Aguascalientes Baja California Chihuahua Coahuila Estado de México Guanajuato Jalisco Morelos Nuevo León Puebla San Luis Potosí Sonora
Heavy vehicles and their Engines	Baja California Coahuila Estado de México Guanajuato Hidalgo Nuevo León Querétaro San Luis Potosí
Centres of research and development	Aguascalientes Baja California Chihuahua Mexico City Estado de México Jalisco Nuevo León Puebla

[71] The automotive industry in Mexico http://mim.promexico.gob.mx/swb/mim/Automotriz
[72] Mexico - Industrial automotive clusters make the future "suppliers of the suppliers" www.clustercollaboration.eu/news/mexico-industrial-automotive-clusters-make-future-suppliers-suppliers
[73] The automotive industry in Mexico http://mim.promexico.gob.mx/swb/mim/Automotriz

Main subsectors	Top locations
	Querétaro San Luis Potosí Sonora

Mexico's most important automotive cluster organisations include:

Nuevo León Auto Cluster (CLAUT)

CLAUT is a non-profit organisation comprised of 92 members, including Tier 1 and Tier 2 auto industry manufacturers and related academic and government institutions. The cluster understands the automotive industry as an integrated chain from automotive assembly to Tier 1, Tier 2 and Tier 3 suppliers, including supporting companies such as logistics services, consultancy and other related services.

CLAUT aims to boost competitiveness and support growth of the automotive sector in Nuevo León through the promotion of synergies between government, academia, and businesses. Therefore, the cluster aims to contribute to the development of Mexico's automotive industry by promoting competitiveness, technology, and sustainable growth.

CLAUT has 21 work groups (8 committees and 13 subcommittees), which aim to represent the interests of the associated companies, educational institutions and governmental entities. The work groups meet regularly to discuss the development of projects to boost the automotive sector in Nuevo Léon. Moreover, the cluster has established diverse strategic alliances with Mexico's entities, including ProMéxico, CONACYT, CNP, and Asociación Mexicana de la Industria Automotriz (AMIA)[74].

The Guanajuato Auto Cluster (CLAUGTO)

CLAUGTO was created in 2012 with the aim of boosting Guanajuato's automotive sector. The cluster has 119 members, including 70 Tier 1 members, 17 development suppliers, 15 institutions, 12 collaborators, and five OEMs in the Advisory Council. CLAUGTO has members from several countries, including the USA, Germany, Italy, Japan, Korea, Spain, and Brazil.

In addition, CLAUGTO is composed of six committees, namely Human Capital, Purchasing, Supply Chain, Innovation and Technology, Supplier Development and Patrimonial Security. The committees are responsible for disseminating information, identifying possible synergies among the actors involved, evaluating and prioritising proposals, and assessing the projects that may benefit the automotive sector[75].

Clúster Automotriz Estado de México

The Clúster Automotriz Estado de México is a non-profit organisation composed of 50 members that include OEMs, Tier 1, Tier 2 and Tier 3 suppliers, consulting firms, logistics companies, customs agents and other service companies from the region's automotive industry value chain. The cluster's goal is

[74] Nuevo León Auto Cluster www.claut.com.mx/home
[75] Guanajuato Auto Cluster http://claugto.org/

to promote the development of the sector and strengthen business networks by connecting companies and advocating projects that trigger regional growth and productivity[76].

The cluster aims to be a reference in the Mexican automotive industry, strengthening the position of the State of Mexico in the sector through the promotion of the triple helix model. The cluster has five committees, namely Development of Providers, Human Capital, Energy Efficiency, Innovation and Technological Development, and Operational Excellence[77].

Chihuahua Auto Cluster

The Chihuahua Auto Cluster aims to boost the auto industry in the region through synergies between government, academia, industry, and society. Thus, the cluster's main goal is to promote the development of the auto industry in order to contribute to a sustainable economy and to increase the competitiveness of the region.

The cluster includes 33 companies, 16 education institutes, three design/innovation centres and five committees. The committees are focused on Technological Development, Outreach and Promotion, Supply Chain, Education, and Membership. The cluster also has national and regional strategic partners, including ProMéxico, AMIA, FECHAC, and Secretaría de Economía.

The Chihuahua Auto Cluster includes suppliers of four strategic processes: plastic injection molding, metal stamping, aluminium injection molding, and machining. In addition, Chihuahua has received international investment from countries including Brazil, China, France, Germany, Italy, Japan and USA[78].

Aerospace clusters

Mexico's aerospace industry has five key clusters in Sonora, Baja California, Chihuahua, Nuevo Leon, and Queretaro, which drive the aviation industry and contribute to the overall success of the aerospace production. Each of the five clusters maintains their own speciality, which brings added value to Mexico's entire aerospace value chain. However, in recent years, due to the projections of higher industry growth, the aerospace manufacturing in Mexico is expected to be located in more states[79]. Figure 2 represents the main aerospace clusters in México by state[80].

[76] Cluster Automotriz Estado de Mexico www.clautedomex.mx/clautedomex.mx
[77] Cluster Automotriz Estado de Mexico www.clautedomex.mx/clautedomex.mx
[78] Chihuahua Auto Cluster http://autocluster.org/
[79] Aerospace Industry Clusters in Mexico https://insights.offshoregroup.com/mexico-is-quickly-becoming-an-aerospace-powerhouse
[80] The aeropace industry in Mexico http://mim.promexico.gob.mx/swb/mim/Aeroespacial

FIGURE 2 – MAIN AEROSPACE CLUSTERS IN MEXICO- BY STATE[81]

Mexico's most important aerospace cluster organisations include:

Baja California Aerospace Cluster

The Baja California Aerospace Cluster is focused on knowledge process outsourcing, electrical plants, and fuselage systems or landing gear and other small aircraft mechanisms. The cluster is the oldest and the largest aerospace cluster in Mexico. The cluster is home to approximately 110 companies and represents more than 35,000 direct jobs. In addition, the state of Baja California is a main logistics point at the border with the USA, promoting equal access to California's manufacturing industry.

In 2015, exports from this cluster amounted to €1,374.46 million annually[82]. A list of their relevant manufactured products is provided on the cluster website such as turbine parts, plane interiors and equipment and electronic compartments[83].

Furthermore, the Pro-Aéreo plan published by ProMéxico aims to consolidate more initiatives that can advance the capabilities of the aerospace sector in Baja California, aimed at maintaining its position as an international hub for the export of R&D aerospace industry services by 2025[84].

Monterrey Aerocluster (Nuevo Léon)

Monterrey Aerocluster is a non-profit organisation established in 2009, which follows the triple helix model. The cluster aims to boost the development of the aerospace and advanced manufacturing sector in north-eastern Mexico through the promotion of collaborative projects. Thus, the cluster is focused on fostering the incorporation of local suppliers into national and international value chains

[81] ProMéxico, The Aerospace Sector www.promexico.gob.mx/documentos/sectores/aeroespace.pdf
[82] Aerospace Alliance of Baja California www.bajaaerospace.org/
[83] Aerospace Alliance of Baja California www.bajaaerospace.org/manufactured-products
[84] The aerospace sector in Mexico www.tibagroup.com/mx/en/aerospace-industry

by promoting the development of suppliers that manufacture high value-added parts for major OEMs and Tier 1 country[85].

The cluster partnership includes aerospace manufacturers, aviation companies, services and specialised suppliers, education institution and public sector bodies. The main industrial capacities of the cluster partners include MROs, numerical machining of parts and components, metal fabrication of sub-assemblies for aero-structures, thermal and surface treatments, and mechanical and non-destructive inspection tests. Moreover, the cluster has five committees, namely Machining Committee for Advanced Manufacturing, MRO Committee for Aviation, Human Talent Committee, Corporate Social Responsibility Committee, and Energy Efficiency Committee[86].

Chihuahua´s Aerospace Cluster

The Chihuahua´s Aerospace Cluster was created with the aim of strengthening the capabilities and growth opportunities for manufacturing and service companies established or interested to become established in Chihuahua by offering facilitation services to start or ramp up operation, negotiating government incentives, organising high technology training and facilitating certification services and supply chains. The cluster's specific objectives include (1) aerospace cluster integration, (2) establishment of an MRO company, (3) development of an integral aviation services centre, and (4) establishment of a technological road map for 2023[87].

Currently, Chihuahua´s Aerospace Cluster has over 45 members which include OEMs, large companies, SMEs in aircraft manufacturing, R&D and education centres, and public and private organisations. The cluster's main areas are aerostructures, engines, harnesses, interiors, machining, sheet metal, evacuation systems, and thermal and surface treatments. Furthermore, the cluster strategic partners include ProMéxico, Chihuahua Secratariat of Innovation and Economic Development, and the Mexican Federation of Aerospace Industry (FEMIA)[88] .

Aerocluster of Querétaro

The Aerocluster of Querétaro aims to promote and consolidate the aerospace industry in the Queretaro State by increasing its competitiveness. The cluster's lines of action include supply chain development, cooperation and internationalisation, scientific and technological development, employment and human resources training, and SMEs support[89].

The Aerocluster of Querétaro is composed of research centres, educational institutions, airport service suppliers and airlines, MROs, and support services. The cluster members work together with various stakeholders to promote the sustainable growth of the aerospace industry, as well as to implement projects of high impact that can benefit SMEs and large companies. Moreover, the cluster has a leading position in landing gear design and manufacturing, and also boasts expertise in turbines[90].

[85] Aerospace Cluster of Nuevo Leon- Monterrey aerospace www.monterreyaerocluster.com
[86] Monterrey Aerocluster www.monterreyaerocluster.com/
[87] Chihuahua´s Aerospace Cluster http://aerospaceclusterchihuahua.com/?page_id=14860
[88] Chihuahua´s Aerospace Cluster brochure http://aerospaceclusterchihuahua.com/assets/Brochure%20CAC%202018.pdf
[89] Aerocluster of Querétaro https://aeroclusterqueretaro.mx/about/
[90] Aerocluster of Querétaro https://aeroclusterqueretaro.mx/members/#members

Renewable Energy Clusters

In recent years, Mexico's energy clusters have been increasing in number and amount of projects developed. Currently, the states of Aguascalientes, Guanajuato, Queretaro and San Luis Potosi aim to create a major energy cluster, which would allow synergies between key diverse public and private institutions[91]. According to data from the recently discontinued ProMéxico agency, there are 99 renewable energy projects in Mexico. Table 4 presents the top locations of Mexico's renewable energy projects[92].

TABLE 4 - TOP LOCATIONS OF MEXICO'S RENEWABLE ENERGY PROJECTS[93]

Renewable energy projects	Top locations
Bioenergy Projects	Aguascalientes Baja California Campeche Chiapas Chihuahua Coahuila Colima Durango Estado de México Guanajuato Hidalgo Jalisco Michoacán Morelos Nayarit Nuevo León Oaxaca Puebla Querétaro Quintana Roo San Luis Potosí Sinaloa Sonora Tabasco Tamaulipas Veracruz
Geothermal Power Projects	Baja California Sur Hidalgo Jalisco Michoacán Nayarit Puebla
Hydro Power Projects	Baja California Chiapas Chihuahua Coahuila Durango Estado de México Guanajuato Guerrero Hidalgo Jalisco Michoacán Nayarit Oaxaca Puebla Querétaro San Luis Potosí Sinaloa Sonora Tamaulipas Veracruz
Solar Power Projects	Aguascalientes Morelos

[91] The Week in Energy: Energy Clusters and Energy Storage on the Rise www.renewableenergymexico.com/the-week-in-energy-energy-clusters-and-energy-storage-on-the-rise/

[92] Renewable energy industry in México http://mim.promexico.gob.mx/swb/mim/Energias_renovables

[93] Renewable energy industry in México http://mim.promexico.gob.mx/swb/mim/Energias_renovables

Renewable energy projects	Top locations	
	Baja California	Nayarit
	Baja California Sur	Nuevo León
	Campeche	Puebla
	Chiapas	Querétaro
	Chihuahua	Quintana Roo
	Coahuila	San Luis Potosí
	Colima	Sinaloa
	Durango	Sonora
	Estado de México	Tabasco
	Guanajuato	Tamaulipas
	Guerrero	Veracruz
	Hidalgo	Yucatán
	Jalisco	Zacatecas
Wind Power Projects	Baja California	Oaxaca
	Baja California Sur	Puebla
	Chiapas	Querétaro
	Chihuahua	Quintana Roo
	Coahuila	San Luis Potosí
	Durango	Sonora
	Hidalgo	Tamaulipas
	Jalisco	Veracruz
	Nuevo León	Yucatán
		Zacatecas

Mexico's most important energy cluster organisations include:

Nuevo León Energy Cluster

The Nuevo León Energy Cluster is a civil association that promotes the triple helix model to boost the competitiveness of the energy sector in the state of Nuevo León. Thus, the cluster aims to foster the development of the energy sector in the state, both in terms of conventional energy and clean energy**.** The specific objectives of the cluster include developing an intra-sectoral ecosystem that promotes the creation of new companies, increases competitiveness and fosters innovation, R&D and human capital[94].

The cluster has five committees, Regulation Committee, Committee for the Development of Human Capital and Innovation, Committee of Competitiveness in Hydrocarbons, Committee of Competitiveness in Clean Energies, and Committee of Competitiveness in Electricity. The committees aim to ensure intra and inter-sector coordination, address emerging challenges and take advantage of upcoming investment opportunities[95].

[94] Nuevo León Energy Cluster http://clusterenergetico.com/nosotros/

[95] New energy cluster in Mexican state of Nuevo León https://oxfordbusinessgroup.com/analysis/powering-new-energy-cluster-nuevo-le%C3%B3n-paves-way-future-investment-gas-and-electricity-generation

Cleantech Cluster Mexico (Puebla)

Founded in 2011 in the city of Puebla, Cleantech Cluster Mexico is a member of the Global Cleantech Cluster Association. The cluster aims to strengthen the creation of new businesses focused on clean technologies, through partnerships between the public, private and social sectors. This was the first cluster established in Mexico with the objective of promoting the environmental industry sector. Moreover, the cluster works with cleantech researchers, businesses and public authorities in order to support cleantech companies in gap-funding, test, demonstration and market access[96].

ICT clusters

Mexico's ICT clusters are considered key actors in the promotion of a common vision for the country's ICT sector. In 2016, there were 13 recognised ICT clusters in Mexico.

TABLE 5 - ICT CLUSTERS[97]

ICT Clusters in 2016	
1. Clúster de Tecnologías de Información de B.C. DITTIZAC	7. Consejo para el Desarrollo de la Industria de Software de Nuevo León
2. Asociación Internacional de Mentefactura, Software e Internet IJALTI	8. DITTIZAC
3. Chihuahua IT Cluster Impulse TI	9. IJALTI
4. Cluster de Integradores de Alta Tecnología Integracion Tecnologica De Queretaro	10. Impulse TI
5. Clúster de Tecnología de Información Tlaxcala Monterry IT Cluster	11. Integracion Tecnologica De Queretaro
6. Cluster Puebla TIC Prosoftware	12. Monterry IT Cluster
	13. Prosoftware

Below are a few examples of well-established clusters.

Nuevo León ICT Cluster (Csoftmty)

Csoftmty is Nuevo León's ICT cluster, and considered the first cluster created in this state. The cluster aims to become a world-leading provider of IT solutions and services, specialised in cutting-edge market niches, and recognised for its ecosystem of entrepreneurship and digital innovation. Thus, the cluster's main mission is to support its member companies through creating conditions and opportunities that generate jobs and economic growth[98].

Csoftmty follows a triple helix model, where academy, government and private organisations aim to create the conditions for Monterrey to become an international leader in software development and design. Csoftmty's membership includes active associates, affiliate partners, associate entrepreneurs and strategic allies[99]. Moreover, the cluster includes three committees which aim to promote the

[96] Cleantech Cluster Mexico www.linkedin.com/company/cleantech-cluster-mexico/
[97] Cluster Management Excellence in Mexico www.cluster-analysis.org/downloads/country-report-mexico-en-public
[98] Csoftmty www.csoftmty.org/en/about-us.php
[99] Csoftmty www.csoftmty.org/en/members.php

development of Nuevo León's software industry: Market Committee, Human Capital Committee, Committee on Entrepreneurship and Innovation[100].

Jalisco Information Technology Cluster (Instituto Jalisciense de Tecnologías de la Información)

The Jalisco IT cluster aims to strengthen and consolidate the region's IT sector and promote regional economic growth. The specific objectives of the cluster include consolidating a knowledge base for the local IT ecosystem, promoting competitiveness and fostering the development of initiatives and strategic projects for the cluster. The cluster is grounded on nine main pilars: (1) corporate social responsibility, (2) internationalisation, (3) entrepreneurship, (4) talent, (5) innovation, (6) business opportunities, (7) positioning of the cluster, (8) ecosytem conditions, and (9) financing and cooperation[101].

Jalisco's cluster ecosystem includes more than 120 technological communities, 28 higher education institutes, 18 industry related organisations, 500 IT companies, as well as support from governamental bodies. In this context, the cluster provides information, training, consultancy and project management services for its members in order to foster productivity, competitiveness and innovation[102].

Baja California IT cluster (IT@BAJA)

IT@BAJA aims to promote the development of software companies, as well as the creation of an innovation ecosystem in Baja California. Thus, the cluster's activity is focused on four strategic axes, namely scale up of technological companies, infrastructure development, market expansion, and integration with Baja California's innovation ecosystem.

IT@BAJA has approximately 105 members including companies, consultancies, freelancers, academia and industry organisations. The cluster represents 7,500 jobs, among technical and engineering activities in different ICT areas. Moreover, the cluster's membership includes 23 companies certified in Quality Software Development models recognised worldwide as CMMI and MoProsoft.

IT@Baja operates through three representative offices in Tijuana, Mexicali and Los Angeles, and includes five working groups identified as Talent & Human Capital, Industry 4.0, Market Expansion USA and Mexico, Tech GYM Hub IT CICE III, and Entrepreneurs. Moreover, the cluster offers services in 12 areas: (1) software development, (2) IoT and cloud computing services, (3) cyber security solutions, (4) internet services, (5) industry 4.0, (6) fintech, (7) audiovisual and effects, (8) eHealth solutions, (9) educations apps and software, (10) automation and robotics solutions, (11) government apps and software, and (12) mobile apps and videogames development[103].

[100] Csoftmty www.csoftmty.org/en/committees.php
[101] Jalisco Information Technology Cluster www.ijalti.org.mx/ict-cluster/?lang=en
[102] Jalisco Information Technology Cluster www.ijalti.org.mx/ict-cluster/?lang=en
[103] ITBAJA borderless technology development https://itbaja.org/wp-content/uploads/2017/11/whitepaper.pdf

4. Cluster policies and programmes in Mexico

4.1 The cluster policy of Mexico

Mexican clusters are managed differently at the federal and state levels. At the federal level, the Mexican government sponsors several programmes designed to support cluster organisations. The topics and the organisation responsible for the implementation of the programmes are different each year. Although, the topics often include financing, consulting, workshops, training and networking activities. The National Secretary for Economy is the primary organisation responsible for the development of cluster policies, closely related to industry, competitiveness and innovation. It also manages the quality labelling system.

Moreover, the National Institute for Entrepreneurs (INADEM), within the Mexican Ministry of Economy, aims to implement, execute and manage policies that support SMEs and entrepreneurs and promote innovation and competitiveness. These policies can also benefit cluster organisations and their members[104]. The Secretary for Economy also encourages internationalisation and provides services to facilitate the process.

At the state level, the State Secretary for Developing Economy is the key public stakeholder. Cluster policies are managed rather autonomously and each state develops their own programmes and initiatives to strengthen local clusters. For instance, the states of Baja California[105], Nuevo León[106] and Aguascalientes[107] provide specific information and contact details of the existing industrial clusters in their states on their websites. The promotion of entrepreneurship and competitiveness by means of establishing synergies and integrating SMEs in value chains is among the most important objectives of the states' programmes. Moreover, the promotion of a triple helix model is also considered important.

The generalised absence of consistent policy guidelines makes cluster organisations the main drivers of industry development. Mexican clusters often collaborate with each other to enhance their competitiveness in the global scenario and, in some cases, they are organised around very strong cluster organisations or business associations that set the roadmaps and the pace.

In 2014, the Project iCluster was launched with the aim of boosting regional economic development through clusters in Mexico and in the USA. To achieve this goal, the project intends to build an ecosystem that facilitates and optimises the collaboration between government, industry and academy in order to foster innovation and entrepreneurship. Thus, iCluster identifies and promotes high-impact projects through innovation clusters along one core initiative (sustainable economic development) and four cross-cutting initiatives (international cooperation, high-impact

[104] INADEM www.inadem.gob.mx
[105] Red estatal de clústers Baja California https://rmcbc.spribo.com/
[106] Consejo nacional de clústers de Nuevo León http://cecnl.mx/index.php
[107] Gobierno estatal de Aguascalientes www.aguascalientes.gob.mx/temas/economia/agrupamientos/clusters/

entrepreneurship, gender equality and digital transformation), which intersect in common entrepreneurship and innovation knowledge flows[108].

Regarding internationalisation, the Secretary for Economy, taking over the tasks from the discontinued ProMéxico agency, provides specific services to SMEs, such as networking, legal advices about intellectual property, governmental support, and identification and analysis of projects' viability. The Attaché of Economic Affairs of Mexico in the embassies of each country also support international trade and internationalisation.

In 2012, ProMéxico signed a Memorandum of Understanding (MoU) with the ECCP**.** Both organisations committed to motivating and facilitating the partnering between cluster organisations and cluster firms of Mexico and Europe. This resulted in the first policy initiative to foster the internationalisation of Mexican clusters[109,110]. However, due to the recent discontinuation of ProMéxico, the future of this agreement remains uncertain, which may hinder EU-Mexico cluster cooperation.

Even though the Mexican government has not developed national policies to support the creation, development and consolidation of cluster organisations, there are several sectoral policies designed to foster the development of priority sectors.

4.2 Automotive policies and programmes

The automotive industry plays a key role in the Mexican economy, since it acts as a booster for the development of other sectors. As a result, Mexico's government has been establishing numerous support programmes and policies to promote the sector's growth, such as:

1. **PROSEC Automotive**

The Sectorial Promotion Programmes (PROSEC) enables manufacturers to import their parts at preferential tariffs, in order to ensure they remain competitive, especially in key industries as the automotive industry[111].

2. **Automotive Decree**

The Decree to "foster the competitiveness of the terminal automotive industry and the development of the domestic automotive market"[112] (*Decreto para el apoyo de la competitividad de la industria automotriz terminal y el impulso al desarrollo del mercado interno de automóviles)*, which has been in force since 2003, aims to promote investment in light vehicles' manufacturing.

Companies that comply with the following requirements can register themselves as light vehicles manufacturers to access the Decree benefits. The criteria are: light vehicle production companies

[108] Project iCluster https://icluster.spribo.com/icluster
[109] ECCP - D3.1 Initial Report Mexico, 2016 (Confidential report).
[110] ECCP-ProMexico MoU
www.clustercollaboration.eu/sites/default/files/international_cooperation/mou_eu_mexico_2013.pdf
[111] The Mexican automotive industry: Current situation, challenges and opportunities
www.promexico.mx/documentos/biblioteca/the-mexican-automotive-industry.pdf
[112] Decree to "foster the competitiveness of the terminal automotive industry and the development of the domestic automotive market" www.gob.mx/cms/uploads/attachment/file/86907/D25.pdf

established in Mexico that have invested at least €87.7 million in fixed assets and produced a minimum of 50,000 units annually; companies that conduct manufacturing processes, montage, or armour, which increase the vehicle's value by 50%; and companies in the process of accomplishing the minimum required annual production but have covered the remaining requirements[113].

3. Eighth Rule

The Eighth Rule is connected to the PROSEC Automotive programmes and allows companies to import materials, inputs, parts and components under tariff code 9802.00.19 of the Mexican Import and Export Tariff (TIGIE) at a zero rate, provided the provisions of the Eighth Rule of the applicable complementary regulations have been met[114].

4. Official Mexican Norms (NOM's)

There are two international regulatory bodies in the automotive industry that issue international vehicle manufacturing guidelines, standards and certifications: the UNECE World Forum for the Harmonization of Vehicle Regulations (WP.29) and the WTO. The first was established by the EU, while the latter regulates imports of vehicles worldwide by any country that is a member of the WTO. In this context, Mexico keeps up to date with regulations issued by the WP.29. It began incorporating the minimum vehicle safety standards it recommends into its vehicles in 2011[115]. Agencies with authority on NOM's in the automotive sector include:

- SEMARNAT - The Mexican Secretariat of Environment and Natural Resources (Mexican Government) promotes Mexico's ecological system by developing instruments and policies to protect the environment; and by planning, monitoring and evaluating progress in abating emissions of pollutants into the atmosphere.
- Seguridad SC - This entity is responsible for regulating federal services, international road transport, private transport and developing formal rules.
- Información al consumidor SE y PROFECO (Office of the Federal Prosecutor for the Consumer) - The main goals of this organisation are: to monitor the marketing, distribution and consumption of goods and services and to design general industry, trade, supply and price policies.

5. Free Trading Agreements (FTAs)

Mexico has some agreements in the automotive field:

- Free Trade Agreement (FTA) EU- Mexico;
- North American Free Trade Agreement (NAFTA) - USA, Canada and Mexico (under revision);
- Free Trade Agreement and Economic Partnership Agreement (FTA & EPA) Japan-Mexico; and

[113] Decree to "foster the competitiveness of the terminal automotive industry and the development of the domestic automotive market" www.gob.mx/cms/uploads/attachment/file/86907/D25.pdf
[114] The Mexican automotive industry: Current situation, challenges and opportunities www.promexico.mx/documentos/biblioteca/the-mexican-automotive-industry.pdf
[115] The Mexican automotive industry: Current situation, challenges and opportunities www.promexico.mx/documentos/biblioteca/the-mexican-automotive-industry.pdf

- Acuerdo de Complementación Económica (ACE 55- economic complementation agreement) Mercosur-Mexico.

4.3 Aerospace policies and programmes

Over the last 40 years, the Mexican government has made efforts to open its economy and expand its industrial base. Starting with the Border Industrialisation Programme in 1964, Mexico has tried to implement a series of trade, customs and economic policies, such as:

1. **In-bond or Maquiladora programme:**

In 1965, the Mexican government established the In-Bond or Maquiladora programme, which allows duty-free importation of raw materials, components and equipment needed for the assembly or manufacture of finished goods for export. Under this programme, 'maquiladoras' are foreign-owned, controlled or subcontracted manufacturing plants that process or assemble imported components for export. Thus, 'Maquiladoras' operate under a special customs regime which allows the 'Maquiladora' to temporarily import on a duty free basis, machinery, equipment, materials, parts and components. Moreover, the programme entitles the company to foreign investment participation in the capital and in the management of up to 100% without need of any special authorisation[116].

2. **Pro-Aéreo 2012-2020**

In 2012, the Mexican Secretariat of Economy launched the Aerospace Industry National Strategic Program 2012-2020, named Pro-Aéreo. This programme aims to elevate Mexico to the top 10 global aerospace suppliers by 2020, with a forecasted value of €10.5 billion in exports, and the creation of 110,000 jobs (between 30-35% engineer positions). Thus, Pro-Aero establishes policies for market development, domestic and international promotion, technological and human resource development, and vertical integration[117,118].

3. **Orbit Plan 2.0 (Plan de Órbita 2.0)**

In 2017, the Mexican Space Agency (AEM), the Ministry of Economy, and ProMéxico launched the Orbit Plan 2.0, a strategic space sector development programme that outlines niche opportunities and recommendations on specific space projects. This Plan establishes specific steps in terms of terms of laboratory validation, standardisation and accreditation infrastructure; critical technologies; R&D; the creation of a Mexican satellite platform to observe the Earth through the development of instrumentation, useful payloads, and applications, links and other aspects of technology development to improve national capacities and competences[119].

Moreover, numerous institutions in Mexico are regulating, promoting and establishing the aerospace industry to a higher level, including:

[116] NAFTA and the Maquiladora Program http://teamnafta.com/manufacturing-resources-pages/2016/4/18/nafta-and-the-maquiladora-program
[117] Pro-Aéreo www.2006-2012.economia.gob.mx/files/comunidad_negocios/industria_comercio/proaereo_resumen_ejecutivo.pdf
[118] Mexico - B. Aerospace www.export.gov/article?id=Mexico-Aerospace
[119] Orbit Plan 2.0 www.promexico.gob.mx/documentos/mapas-de-ruta/orbit-plan.pdf

- The Federación Mexicana de la Industria Aeroespacial (FEMIA);
- The Dirección General de Aeronáutica Civil (DGCA);
- The Mexican Council of Aerospace Education (COMEA); and
- The Mexican Space Agency (AEM)[120].

4.4 Renewable Energy policies and programmes

Mexico's government has contributed to the development of the renewable energy industry by adapting the legislative framework and creating funds for programmes focused in energy efficiency and renewable energy, such as:

1. **Electricity Industry Law**

The Electricity Industry Law entered into force in 2014 and includes regulations for the integration of renewable energy into Mexico's national grid. Thus, according to this law, the clean energy generation target will be enforced through a Clean Energy Certificates system and the government strategies for the electrification of rural and semi-urban areas. The Electricity Industry Law also established that the grid operation would become independent[121].

2. **Energy Transition Law (Ley de Transición Energética, LTE)**

LTE was created in 2014 and replaced the former law for the Use of Renewable Sources of Energy. LTE aims to develop a framework for implementing clean energy measures, energy efficiency, and greenhouse gas emission reductions. Therefore, the LTE established four planning mechanisms: a national strategy to define clean energy and energy efficiency goals; two special programmes to implement this strategy; and a third programme focused on smart grids. According to this law, the medium-term goals for clean energy are: 25% by 2018, 30% by 2021, and 35% by 2024[122].

3. **General Law of Climate Change (Ley General de Cambio Climático)**

The General Law of Climate Change was implemented in 2012 and aims to promote the reduction of greenhouse gas emissions and foster the development of renewable energy sources. The specific goals of this Law include: energy development from clean sources to reach 24% of the total energy by 2024; and emissions to be reduced by 30% by 2020 and by 50% by 2050 compared to the levels of the 2000's[123].

[120] Aerospace Industry in Mexico www.suncorridorinc.com/SunCorridor/media/Sun-Corridor/Documents/Why%20Mexico/PWC-Mexico-Aerospace-Report.pdf?ext=.pdf
[121] Mexico Renewable Energy Policy Handbook 2017 www.arena-international.com/Uploads/2017/11/27/c/c/r/Free-Mexico-Renewable-Energy-Policy-Handbook-2017.pdf
[122] Mexico Renewable Energy Policy Handbook 2017 www.arena-international.com/Uploads/2017/11/27/c/c/r/Free-Mexico-Renewable-Energy-Policy-Handbook-2017.pdf
[123] Mexico Renewable Energy Policy Handbook 2017 www.arena-international.com/Uploads/2017/11/27/c/c/r/Free-Mexico-Renewable-Energy-Policy-Handbook-2017.pdf

4. **Special Programme for the Use of Renewable Energy**

This programme targets 23,345 MW of renewable energy capacity to be installed by 2018. The specific targets include: hydropower, 13,030 MW; wind energy, 8,922 MW; geothermal, 1,018 MW; bioenergy, 784 MW; and solar PV, 627 MW[124].

5. **Accelerated Depreciation for Environmental Investment**

This policy was launched in 2005 with the aim of allowing investors in the field of environmentally friendly technology, including renewable energy, to benefit from accelerated depreciation. Thus, investors in renewable energy projects are allowed to subtract up to 100% of their investment in a single year as defined in articles 21, 22, and 23 of the General Law for Ecological Equilibrium and Environmental Protection[125].

6. **Law for the Sustainable Use of Energy (Ley para el Aprovechamiento Sustentable de la Energía, LASE)**

The LASE was implemented in 2008 to promote the concept of sustainable use of energy in all processes and operations, from exploration to consumption. The Law for Sustainable Use of Energy and the National Program for the Sustainable Use of Energy (PRONASE), which is the strategy to implement energy efficiency targets in all sectors from the federal level, were established under this law[126].

As aforementioned, there is a project underway called *Low Carbon Business Action in Mexico*, which is funded by the EU that expects to reduce the CO_2 emission in the country. The Low Carbon Business Action encourages European and Mexican clusters and companies to establish cooperation partnership agreements in some fields, such as energy efficiency (industry and building) and waste management[127].

4.5 ICT policy and programmes

In recent years, the Mexican government has been fostering universal connectivity and internet access through a wide range of policies. As abovementioned, the 2013 telecommunications reform declared internet access as a constitutional right of all citizens of Mexico, which highly contributed to the development of the country's ICT sector. Moreover, other important programmes have been implemented to promote the growth of the ICT sector, such as:

1. **Special Programme for Science, Technology and Innovation (PECITI)**

The PECITI (2014-18) was designed to transform Mexico into a knowledge-based economy through five main steps: (1) increasing national investment in science technology and innovation (STI); (2) forming

[124] Mexico Renewable Energy Policy Handbook 2017 www.arena-international.com/Uploads/2017/11/27/c/c/r/Free-Mexico-Renewable-Energy-Policy-Handbook-2017.pdf
[125] Mexico Renewable Energy Policy Handbook 2017 www.arena-international.com/Uploads/2017/11/27/c/c/r/Free-Mexico-Renewable-Energy-Policy-Handbook-2017.pdf
[126] Mexico Renewable Energy Policy Handbook 2017 www.arena-international.com/Uploads/2017/11/27/c/c/r/Free-Mexico-Renewable-Energy-Policy-Handbook-2017.pdf
[127] Low Carbon Business Action in Mexico www.lowcarbon.mx

highly qualified human resources in science and technology; (3) strengthening regional development; (4) fostering science-industry linkages; and (5) developing the STI infrastructures[128].

2. **The National Digital Strategy (EDN)**

The EDN is the governmental action plan to encourage the adoption and development of ICT and transform Mexico into an information and knowledge society. The EDN is grounded on five major objectives: (1) government transformation; (2) promotion of digital economy; (3) transformation of the education system; (4) effective universal healthcare; and (5) civic innovation and citizen participation. Thus, EDN's mission is to create an ecosystem of consolidated, interoperable and secure IT services for a modern and efficient public administration[129].

5. Conclusion

Mexico is an industrialised country with a relatively stable economy and a great potential for establishing businesses due to its wide variety of economic sectors, natural resources, favourable geographical position and high skilled labour. In recent years, the Mexican government has been implementing programmes and policies that facilitate business development, manufacturing and innovation in a wide range of sectors. Thus, leading international companies have been establishing operations in Mexico, which has contributed to the growth of the country's innovation ecosystem.

Mexico, and particularly the states of Baja California and Nuevo León, stands out in the automotive, aerospace, renewable energy and ICT sectors. Mexico is ranked among the top producers and exporters of manufactured products. Currently, Mexico is home to numerous clusters and innovation hubs in the four mentioned sectors. In fact, the majority of the Mexican clusters with ECEI's quality labelling are related to the aerospace and ICT sectors, which indicates the quality of the activities performed in the country.

Mexico has trade agreements with a large number of countries, such as NAFTA with USA and Canada (under renegotiation), an FTA with the EU, Mercosur with Latin American countries and an FTA & EPA with Japan, which makes Mexico more attractive to FDI. Moreover, Mexico is cooperating closely with the EU in several areas including STI. The EU and Mexico 'agreement in principle' on the trade is also expected to boost the relationship between both parties and present opportunities for SMEs and large companies.

Mexico and the EU's potential for cluster cooperation can also be reinforced by the fact that there are six first and second generation ESCP-4i interested in establishing cooperation activities with Mexico in the automotive, aerospace, renewable energy and ICT sectors. The ESCP-4i targeting Mexico focused on the sectors covered in this report are the following:

[128] Mexico STI Outlook 2016 www.innovationpolicyplatform.org/content/mexico
[129] Digital government toolkit www.oecd.org/gov/mexico-ICT-policy.pdf

First generation ESCP-4i:

- Activities and Businesses from Real Opportunities for Aerospace Developments (EACP ABROAD) – Aerospace Vehicles and Defence;
- Promoting European Rail Excellence outside EU (PERES) – Automotive sector;
- Energy in Water (EnW) – Renewable energies; and
- Renewable Energy Internationalisation ESCP project for European SMEs (REINA PLUS) - Renewable energies.

Second generation ESCP-4i:

- European Digital Industry Alliance (DIA) - ICT; and
- Geo-Energy for the XXIst Century (GEO-ENERGY EUROPE) - Renewable energies.

This demonstrates the EU and Mexico have shared sectorial priorities, which can lead to important cooperation opportunities.

6. Annex

TABLE 6 – FORMALLY ORGANISED CLUSTERS BY STATE

State	Number of clusters	Clusters (formally organised)	Sector
Aguascalientes[130]	7	Consejo de la Industria del Mueble y Accesorios Afines de Aguascalientes, A.C. (CONIMUEBLE)	Furniture
		Consejo de la Cadena Industrial Textil y del Vestido de Aguascalientes. (COCITEVA)	Textile
		Consejo de la Electrónica y Suministro de aguascalientes S.C (CELESA)	Electronics
		Cluster de Tecnologías de la Información de Aguascalientes A.C (INNOVATIA)	ICT
		Cluster de la Industria de los Alimentos y su Tecnología (CIATAC)	Alimentary industry
		Cluster de Autotransporte Logístico de Aguascalientes A.C. (CLUSTRANS)	Logisctics
		Cluster de Robótica y Automatización de Aguascalientes (CRAA)	Robotic
Baja California[131]	10	Aerospace Alliance of Baja California, A.C	Aerospace
		Clúster de Bioeconomía de Baja California	Bioeconomy
		Baja Clúster Aeroespacial	Aerospace
		Cluster Mueblero Baja California (AFAMBAC)	Furniture
		Cluster Tecnologías de información de Baja California	ICT
		Cluster de Logistica de Baja California	Logistcs
		Asociacion Industrial de Productos Médicos de las Californias	Medical Devices
		Cluster de Turismo Medico y de Salud – Mexicali Healthcare	Tourism Healthcare
		Cluster de Servicios de Salud de Baja California	Health
		Sistema Producto Vid de Baja California, A.C.	Agroindustry
Campeche[132]	2	CamBio Cluster	Biotechnology
		Cluster Agropecuario	Agroindustry
Chiapas	1	Cluster TI de Chiapas[133]	ICT
Chihuahua[134]	2	Chihuahua's Aerospace Cluster	Aerospace
		Automotive Cluster Chihuahua	Automotive
Ciudad de México[135]	6	Clúster de la construcción e inmobiliaria	Real Estate
		Clúster de la industria del transporte y la logística	Logistics

[130] Clusters www.aguascalientes.gob.mx/temas/economia/agrupamientos/clusters/
[131] Red Estatas de Clústeres Baja California https://icluster-bajacalifornia.spribo.com/clusters
[132] Principales Clusters Productivos: Región Sureste https://prezi.com/0np7zusirada/principales-clusters-productivos-region-sureste/
[133] www.clustertichiapas.com.mx/acerca.php
[134] Index Chihuahua www.indexchihuahua.org/clusters-industriales.html
[135] www.izt.uam.mx/sotraem/Documentos/AMET2011/AMET2011/REC/TEXTO/11-13/11_04.pdf

State	Number of clusters	Clusters (formally organised)	Sector
		El clúster de la Publicidad	Marketing
		Clúster de las telecomunicaciones	Media
		Clúster de Servicios Financieros	Finance
		Prosoftware	ICT
Coahuila[136]	3	Cluster de Energía Coahuila[137]	Energy
		Cluster Agroindustria y de Alimentos Procesados de La Laguna	Agroindustry
		Cluster Automotriz	Automotive
Colima	1	Cluster de Tecnologías de la Información de Colima (AIMSI)[138]	ICT
Guanajuato[139]	4	Cluster Automotriz de Guanajuato	Automotive
		Cluster de Vivienda	Real Estate
		Clúster Alimentos de Guanajuato	Agroindustry
		Clúster Químico de Guanajuato	Chemistry
Jalisco	6	Clúster mueblero de Jalisco[140]	Furniture
		Clúster forestal de Jalisco	Forestry
		Cluster Integradores de Alta Tecnología (CIAT)[141]	ICT
		Clúster de Robótica del Estado de Jalisco[142]	Electronic
		Clúster de Ingeniería Biomédica del Estado de Jalisco[143]	Health
		Cluster de la Tecnología de la Información e Instrumentación Analítica[144]	ICT
México State	1	Cluster Automotriz Estado de Mexico (CLAUT)	Automotive
Michoacán	2	Cluster Aguacatero en el estado de Michoacán	Food
		Cluster de Tecnologías de la Información y Comunicaciones de Michoacán (CLUSTERTIM)[145]	ICT
Nuevo León[146]	12	Cluster TIC de Nuevo León (CSoftMty)	ICT
		Cluster Monterrey Ciudad de la Salud	Health
		Cluster Automotriz de Nuevo León (CLAUT)	Automotive
		Cluster Nanotecnología Nuevo León	Nanotechnology
		Cluster Biotecnológico de Nuevo León	Biotechnology
		Cluster de Electrodomésticos	Household
		Monterrey AeroCluster	Aerospace
		Cluster Agroalimentario de Nuevo León	Food

136 Red iCluster Coahuila https://icluster-coahuila.spribo.com/clusters
137 www.clustercoahuila.org.mx
138 Colima IT Cluster www.tci-network.org/initiatives/initiative/4460
139 Red iCluster Jalisco https://icluster-jalisco.spribo.com/clusters
140 www.clustermdjalisco.org
141 www.ciat.mx/personal-injury.html
142 Clúster de Robótica del Estado de Jalisco www.clusterobotica.mx/
143 Clúster de Ingeniería Biomédica del Estado de Jalisco www.clusteringenieria.bio/
144 Red iCluster Jalisco https://icluster-jalisco.spribo.com/cluster?id=1464967233664
145 CLUSTERTIM http://clustertim.com.mx/
146 Red iCluster Nuevo Léon https://icluster-nuevoleon.spribo.com/clusters

State	Number of clusters	Clusters (formally organised)	Sector
		Cluster de Vivienda y Desarrollo Urbano Sostenible	Real Estate
		Clúster Medios Interactivos	Media
		Cluster de Transporte y Logística	Transportation and Logistics
		Cluster de Turismo de Nuevo León	Tourism
Oaxaca[147]	4	Cluster TI Oaxaca	ICT
		Cluster del café	Food
		Cluster de la energía	Energy
		Cluster Madera-Mueble	Furniture
Puebla[148]	7	Cluster Puebla TIC	ICT
		Cluster Automotriz de Puebla	Automotive
		Cámara de la Industria Textil Puebla-Tlaxcala	Textile
		Clúster de tecnologías de información de Tlaxcala A.C.	ICT
		Consejo Agropecuario Poblano A.C.	Agroindustry
		DATIA Tecnoclúster	Automotive
		Puebla Capital de Innovación y Diseño	Media
Querétaro[149]	5	Aerocluster de Querétaro	Aerospace
		Clúster Vortice TI	ICT
		Cluster BioTQ	Biotechnology
		Cluster Automotriz de Querétaro	Automotive
		Clúster Querétaro Médico y de Salud, A.C.	Health
San Luis Potosí	2	Cluster Logítico	Logistics
		Cluster Automotriz	Automotive
		Clúster de Turismo Médico y Salud de San Luis Potosí	Tourism and Health
Sonora	3	Cluster Minero de Sonora	Mining
		Cluster Aeroespacial Sonora	Aerospace
		Cluster de la Industria de las Tecnologías de la Información y Comunicaciones (CITIC)	ICT
Tabasco	1	Cluster Petrolero de Tabasco	Oil
Tamaulipas[150]	3	Cluster Energético Tamaulipas	Energy
		Altamira (cluster petroquímico)	Petrochemical
		Tecnologías de Información de Tamaulipas (Clúster Tit@m)	ICT
Tlaxcala	1	Cluster Tecnologías de Información (CLUSTEC)	ICT

[147] Dirección de Desarrollo de Clústers https://www.clusteroaxaca.com/
[148] Red iCluster Puebla https://icluster-puebla.spribo.com/clusters
[149] Red iCluster Querétaro https://icluster-queretaro.spribo.com/clusters
[150] Setores Estratégicos en Tamaulipas www.tamaulipas.gob.mx/desarrolloeconomico/sectores-estrategicos/

State	Number of clusters	Clusters (formally organised)	Sector
Veracruz	1	Cluster Agroalimentario	Agrofood
Yucatán	2	Cluster of innovation in health sectors	Health
		Cluster industria del software	ICT
Zacatecas	1	Cluster Minero (Clusmin)	Mining

TABLE 7 – EXAMPLES OF EU-MEXICO COOPERATION PROGRAMMES AND PROJECTS

Relation EU-Mexico	Field	Programme	Website and projects
Bilateral Cooperation	Social Cohesion	Social Cohesion Laboratory	http://eeas.europa.eu/delegations/mexico/projects/list_of_projects/22727_en.htm
	Economic innovation and competitiveness	PROCEI	www.procei.mx/Paginas/default.aspx
	Culture	CONACULTA	www.cultura.gob.mx/acerca_de_en/
	Health, energy, nano-science, food, agriculture and biotechnology, transport, security and space.	7FP : EU-MEX INNOVA	www.conacyt.gob.mx/pci/index.php/about-eu-mex-innova/funding?lang=en
	Geothermal Energy	H2020: GEMex	http://ec.europa.eu/research/index.cfm?&na=na-030616&pg=newsalert&year=2016
Regional cooperation in Latin America	Social Cohesion	EUROSocial	http://eurosocial-ii.eu/en
	Energy, agriculture, transport, environment, climate change, SMEs, ICT and social services	LAIF[151]	http://ec.europa.eu/europeaid/regions/latin-america/laif-latin-america-investment-facility_en
	Solar Energy	EURO-SOLAR	http://ec.europa.eu/europeaid/regions/latin-america/euro-solar_en
	Climate Change	EUROCLIMA	www.euroclima.org/en/euroclima
	Social sciences and humanities	Trans-Atlantic Platform	hwww.transatlanticplatform.com/
	STI	AlcueNet	http://alcuenet.eu/about-alcue-net.php
	ICT	Leadership	www.leadershipproject.eu/
	STI	Eranet LAC	http://eranet-lac.eu/
Cooperation on specific issues	Environment	High Level Dialogue on Environment (HLD)	http://ec.europa.eu/environment/international_issues/relations_mexico_en.htm

[151] List of projects approved under programme LAIF in Mexico http://ec.europa.eu/europeaid/policies/innovative-financial-instruments-blending/blending-operations_en

Relation EU-Mexico	Field	Programme	Website and projects
	Nuclear Security	Instrument for Nuclear Safety Cooperation (INSC)	http://ec.europa.eu/europeaid/funding/funding-instruments-programming/funding-instruments/instrument-nuclear-safety-cooperation_en
	Migration and Asylum	Not specific programme	
	Human Rights	European Instrument for Democracy and Human Rights	www.eidhr.eu