European Commission

Roadmap for EU - Mexico S&T cooperation

1. Mexico as a partner of the EU

Mexico is one of the most like-minded among EU's strategic partners, cooperating closely on a wide range of international issues including science, technology and innovation. Mexico is also an emerging country with an increasing weight in the global economy. According to most indicators, Mexico can claim to rank among, or very close to, the leading countries of the world: 15th largest nominal GDP and the 11th largest by purchasing power parity, 11th in population, member of the OECD and the G20.

The EU is Mexico's third-largest trading partner after the US and China. Around 7.7% of Mexico's total trade took place with the EU in 2015. EU trade with Mexico accounted for 1.5% of its total trade in 2015, with a total trade surplus of around €14.4 bn. In 2015 the EU was Mexico's second biggest export market after the US. The EU was also Mexico's third largest source of imports after the United States and China, with €41.8 bn worth of goods imported in 2015. The EU imported €19.3 bn worth of goods from Mexico in 2015. In 2015, Mexico's deficit with the EU continued to grow (totalled USD 25.3 billion in 2015). Over 40% of foreign direct investment in Mexico since 2000 has come from the EU.

The Mexican government has made enormous progress in its structural reforms agenda in various sectors including the areas of telecommunications and energy, aimed at raising productivity, competitiveness and potential output growth. The reform its energy sector, and the end of the longstanding state monopoly, has major implications not only for the oil sector and for the wholesale electricity market, but also for renewables. The government has set an ambitious goal to generate 35% of its energy from renewable sources by 2024 (in 2012, only 4% of electricity was generated from wind, solar and geothermal sources). At COP 21, Mexico has been particularly active on helping to secure the ambitious outcome reached at the Paris conference and will host the 13th Biodiversity Convention to be held in Cancun in 2016.

[*Latest EU-Mexico Summit*]

The last EU-Mexico summit took place in Brussels on 12th of June 2015. In their Joint Statement after the summit, leaders welcomed the progress achieved and made clear that both sides should step up cooperation in research and innovation highlighting the possibilities of expanding bilateral cooperation in research and development, especially in renewable energy and joint initiatives on energy efficiency. Fifteen years after the entry into force of the Global Agreement, both sides decided to adapt the contents of the Global Agreement and the Strategic Partnership to reflect recent global geopolitical shifts. Good progress has been made in the negotiations on the modernisation of the Global Agreement since the first round was held in June 2016. Both sides are committed to conclude the negotiations this year, before the beginning of the presidential election campaign in Mexico. Negotiations are pursued on two tracks: political/cooperation and trade.

[*EU-Mexico non-S&T cooperation agreements*]

In 1997, Mexico was the first Latin American country to conclude an Economic Partnership, Political Coordination and Cooperation Agreement with the EU (hereinafter 'the Global Agreement'), including trade provisions that were developed in a Free Trade Agreement that entered into force in October 2000 for the part related to trade in goods and in 2001 for the one related to trade in services. The Union and Mexico also established a Strategic Partnership in 2008, implemented by a Joint Executive Plan endorsed in 2010.

An EU-Mexico Joint Declaration to enhance cooperation and dialogue on Education and Training was signed in June 2009. The Joint Declaration established the basis for regular exchanges of best practice on issues such as the efficiency, equity and the internationalisation and modernisation of higher education and training systems. The purpose of the policy dialogue is to discuss topics of common interest at a senior official level, in order to exchange best practices and to identify concrete areas for future cooperation. In a longer term perspective, the dialogue aims to encourage more higher education cooperation and mobility between EU and Mexico.

[*EU-Mexico S&T cooperation agreements*]

Signed on 03/02/2004 the Bilateral Agreement for scientific and technological cooperation between the European Community and the United Mexican States, came into force on 13/06/2005. It was renewed for another five years in 2010 and again in 2015. The objective of the S&T Agreement is to encourage, develop and facilitate cooperative activities in areas of common interest by carrying out and supporting scientific and technological research and development activities. The Joint Steering Committee Meetings (JSCM) are normally held once a year. The participants are the Mexican National Council of Science and Technology (CONACYT) from the Mexican side, and from the EU side, Directorate General for Research and Innovation.

The 2018 EU-Mexico Joint Science and Technology Cooperation Committee (JSTCC) meeting was a further testimony of the breadth and dynamism of the partnership that continues to develop very rapidly and favourably. The successful cooperation on science & technology reflects the EU's and Mexico's increasing international engagement and shows that they face similar challenges and share many of the same values and concerns. To provide solutions to these challenges, the EU and Mexico are designing comparable policies, instruments and actions to tackle them. They are improving the framework conditions for their scientists and innovators to work together and they are joining forces in a number of strategic focus areas of mutual benefit.

[*R&I landscape in Mexico*]

The value and performance of the Mexico-EU S&T Agreement should be understood from the relevance of some general data on the size and economic weight of Mexico in the world economy and its comparison with the EU.

First of all, Mexico is a relatively large country with a population of 123m inhabitants (estimate in 2017). It is the second largest Latin American (LATAM) country just after Brazil, accounting for about 19.5% of all population in LATAM. In terms of population, Mexico represents approximately one third of the total population of the EU. As a consequence, it is a large market for products and services and a source of skilled human resources for research and innovation activities.

Obviously, both population and total GDP (USD 1,124.3 billion 2017, estimate) has attracted the interest of many multinationals, including the European ones, which have started operations in the country. Nevertheless, the majority of them were linked to manufacturing or services with very low involvement in research and innovation which is kept in their respective headquarters everywhere. EU companies were looking for lower wages and also as an entry point to the USA due to the FTA with Mexico. Mexican multinationals, some of them owned totally or partially by the Mexican Government (e.g. CEMEX, PEMEX, etc.), became relevant players in other countries in the region and partners of EU companies located in Mexico.

The R&D intensity in 2016 was 0.,51% (OECD, 2016) and it has remained near stable since 2000..With that figure Mexico has one of the lowest levels of public investment in R&D in Latin America and the second lowest in the OECD area (only higher than Chile). The Government remains the main funding agent of the R&I system, with a limited private sector participation as a funding and performing agent. Since 2013, the Government has been working on the design of a new Public Procurement for Innovation policy, Technology transfer, and the commercialisation of research results has been boosted by the creation of Knowledge Transfer Offices and amendments to the Law of Science. However, the development of policies and instruments that support the creation of high-technology start-ups and the progression towards achieving a critical mass of innovative companies remain a challenge. While the STI (Science, Technology and Innovation) governance structure did not experience important changes, a Coordinator of STI in the President Office was created.

The National Development Plan (PECiTI 2014-2018)[1] was developed as a key instrument for the transition of Mexico to a knowledge economy. The mission of PECiTI is to make knowledge and innovation the key instruments for the sustainable economic growth of the country, promoting human development, social justice, democracy, and peace, while reinforcing national sovereignty.

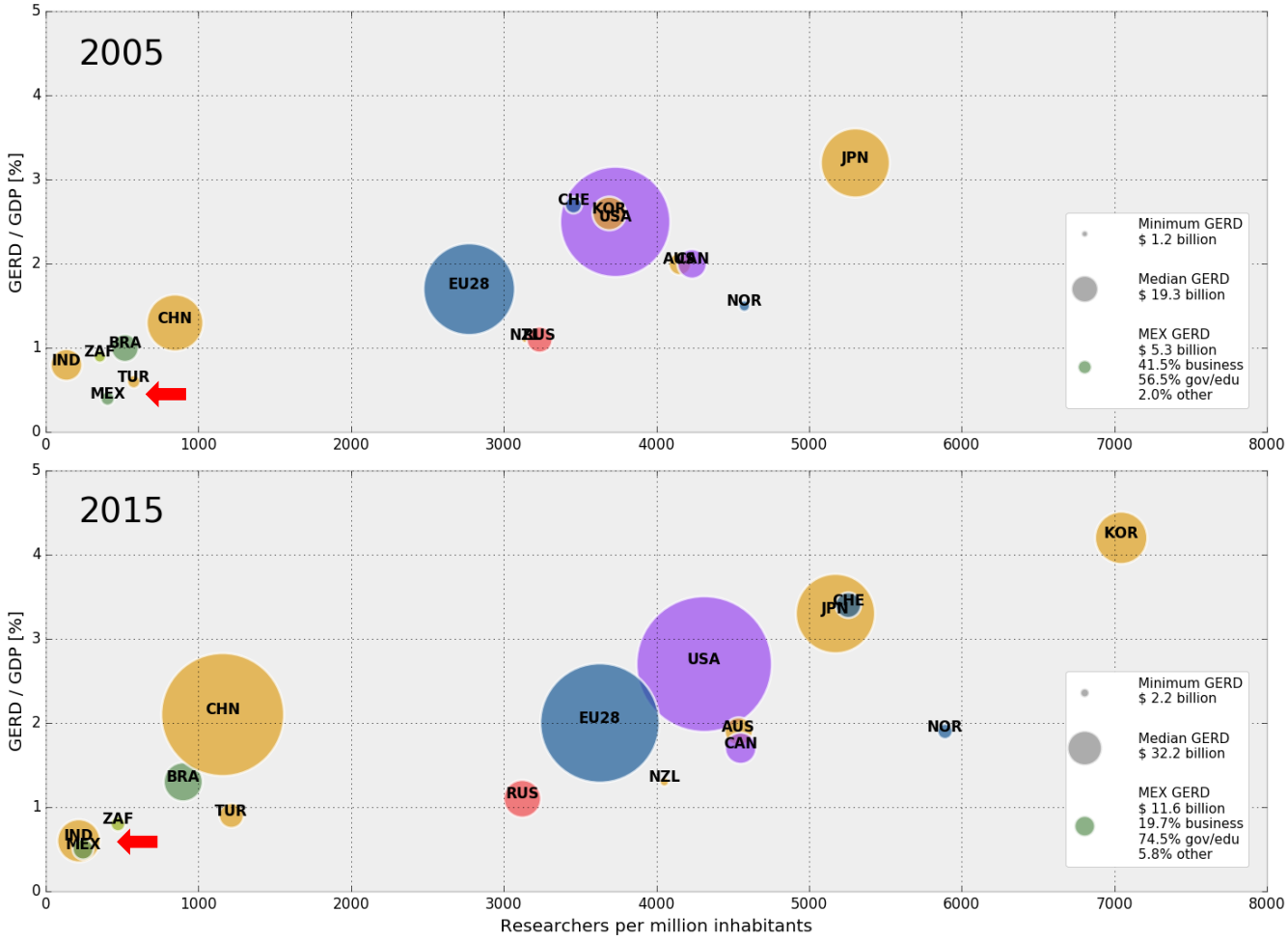
The main quantitative objectives set up in the PECTi 2014-2018 are:

- To increase GERD / GDP from 0.45% in 2013 to 1% in 2018
- To increase the contribution from the private sector from 35.8% in 2013 to 40% in 2018
- To increase the number of researchers per 1,000 employees from 0.94 in 2013 to 1.20 in 2018
- To increase the number of scientific papers per 1 million inhabitants from 94.4 in 2013 to 115 in 2018
- To increase the number of enterprises with innovation activities from 8.2% in 2013 to 20% in 2018

Moreover, CONACYT, which manages around 40% of the public STI budget, seeks to encourage business R&D and innovation. Its Innovation Incentives Programme stimulating business innovation, particularly in SMEs that has three elements: INNOVAPYME (for small and medium-sized enterprises), PROINNOVA (for new and potential technologies) and INNOVATEC (for large firms). The Fund for Fostering Science, Technology and Innovation at regional level (FORDECYT) complements this stimulus programme.

[1] See www.conacyt.gob.mx/images/conacyt/PECiTI 2014-2018.pdf for further information

Figure 1: Expenditures in Research & Development and researchers per million inhabitants



Note: GERD in current PPP; Top chart: Data for CHE from 2004. Bottom chart: Data on researchers per million inhabitants for BRA from 2014, for CAN from 2014, for MEX from 2013 and for AUS from 2010.
Source: DG RTD - International Cooperation
Data: UIS, OECD, EUROSTAT; extraction date: 11/10/2018

2. State of play of EU-MEXICO S&T cooperation

2.1. On-going FP7 and Horizon 2020 cooperation

In FP7 collaborative projects, there were 119 participations of entities from Mexico They took part in 85 projects that had a total budget of €284 million with a total EU contribution to Mexican participants of about €13.31 million. Most of the projects were in the areas of ICT, Nanotechnologies, Materials and Production technologies, and Environment.

In addition 33 Mexican organisations participated 71 times in the Marie Sklodowska-Curie programme. They were awarded a total of EUR 4.8 million from the EU research budget and carried out 56 different projects. Most Mexican Marie Curie researchers chose Spain as destination for their mobility, followed by Germany, the United

Kingdom, France and Switzerland, whereas the 3 Marie Curie fellows who decided to go to Mexico came from Italy, Poland and the United Kingdom.

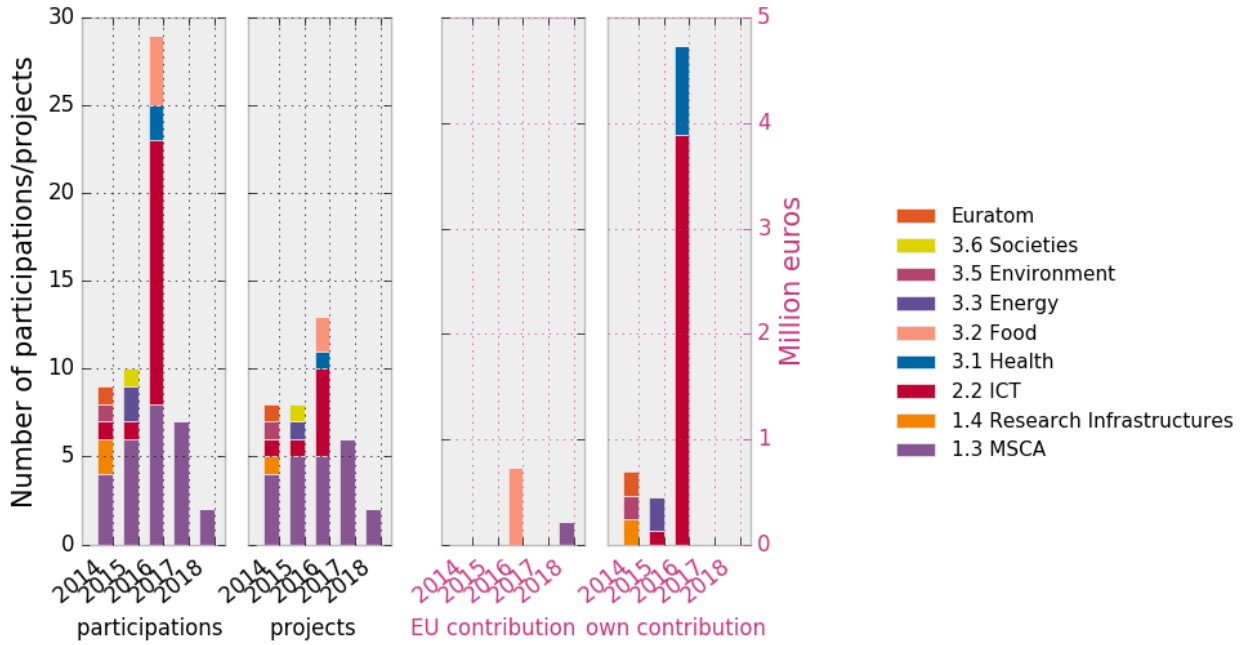
Top Mexican participants in FP7 were the National Autonomous University of Mexico (UNAM); the Technological Institute of Higher Studies of Monterrey (ITESM); CONACYT; Universidad Autonoma Metropolitana(UAM) and the Autonomous University of Nuevo Leon (UANL) whose prestige and excellence is beyond question in a large number of scientific and technological sectors.

Up to October 2018, under Horizon 2020, Mexican entities have participated **57** times to **37** signed grants of Horizon 2020, receiving **0.9 million euros** of direct EU contribution while **5.9** million euros is the non-EU budget of Mexican beneficiaries. Regarding **collaborative actions**[2] of Horizon 2020, Mexican applicants are involved 155 times (2 times as coordinators) in 112 eligible proposals. Out of 59 high-quality (above threshold) proposals, 23 were mainlisted, leading to a success rate of 20.5% (as compared to 17.5% for non-associated countries and 15.8% overall). Mexican entities have 30 participations (29 times as beneficiaries) in 15 signed grants, receiving 0.7 million euros from EU while 5.9 million euros is the non-EU budget of Mexican beneficiaries.

Regarding the Marie Skłodowska-Curie Actions (MSCA), Mexican applicants are involved 174 times in 148 eligible proposals leading to 27 participations (of which 1 as beneficiary) in MSCA actions (1 in Individual Fellowships, 22 in the RISE, 1 in the ITN and 3 in the COFUND programme). MX beneficiaries have received 0.2 million euros EU financial contribution. A total of 135 researchers of MX nationality have participated in MSCA actions.

[2] i.e. excluding projects under ERC, MSCA, SME Instrument and Access to Risk Finance.

Figure 2: Participation of Mexico in Horizon 2020



Note: Participations of beneficiaries, third-parties and partner-organisations.
Source: DG Research and Innovation - International Cooperation
Data: CORDA (JRC, EIT and art.185 not included); extraction date: 15/10/2018

2.2. Current framework conditions for EU-MEXICO S&T cooperation

To support the participation of entities established in Mexico in Horizon 2020 projects, the National Council for Science and Technology of Mexico (CONACYT) has established the so-called **Conacyt-H2020 co-funding mechanism**, in place since 2014.This co-funding mechanism has been the first support scheme put in place by EU international partner countries providing a source of financing "project-by-project participation" to Mexican partners in successful Horizon 2020 projects. This complementary funding mechanism has the objective of reinforcing EU-Mexico STI cooperation by increasing the participation of Mexican research institutions and companies in Horizon 2020 to work closely with European partners. Due to financial adjustments in the implementation of the co-financing mechanism in 2018, Conacyt will prioritise only a few thematic areas of research of common interest for the WP 2018-2020. As a result, even at a time of economic crisis and scarcity of financial resources in Mexico and in the EU, both parties will continue to enhance cooperation in Research and Innovation with the EU in line with the commitment expressed by the Mexican government.

Key principles of the co-funding mechanism

The key principles of the co-funding mechanism are as follows (this is indicative, beyond EC responsibility: When a proposal with a Mexican participant is submitted to a H2020 call, the Mexican partner has to submit the application to CONACYT within 30 days after the closure of the call in Europe, in accordance to the Terms and Conditions of the CONACYT call. When the proposal is selected for funding by the EC, the Mexican participant has to notify the approval to CONACYT in order to start the process of the grant agreement and receive the funding. CONACYT will finance up to an 85% of the total amount requested and approved in the case of public entities (Institutions of Higher Education (IHE), Technologic and Research Centres) and private IHE; and up to 70% of the total amount requested and approved for private entities, except IHE. The complementary amount must be provided by the Mexican entity[3].

An additional effort will be dedicated for the next WP 2018-2020 to support efforts of multipliers, notably National Contact Points, for facilitating access to information and partnering of R&I stakeholders. Moreover, the organisation of R&I Days and other matchmaking events to facilitate partnering with both academia and industry will be organised with the support of the International Cooperation Service Facility in place.

The signature of the implementing Arrangement between the European Research Council (ERC) and CONACYT in 2014 represents an important stepping stone in the S&T relations with Mexico. The two sides also are engaged to make further joint efforts to promote the participation of Mexican researchers and research institutes the EU's Marie Skłodowska-Curie Research Fellowship Programme.

3. Priorities for the future in S&T cooperation

At the 9th Joint EU-Mexico Steering Committee meeting hosted by Conacyt in Mexico City on 22 March 2018 both sides emphasised the need to deepen, scale up and open cooperation in selected thematic areas:

Information and Communication Technologies: Building on the successful activities of the last years, both parties have intensified the collaboration on FIWARE technologies. Both CONACYT and the EC are supporting the projects FIWARE Mexico and SmartSDK in reaching their envisaged stakeholders (including start-ups and industry) in Mexico and the EU, including in the organisation of events and meetings. A second flagship EU-Mexico joint call on High Performance Computing (HPC) will develop strategic partnership in HPC that enables advancing the work on HPC applications in domains of common interest such as energy, including oil, life sciences, earth sciences, climate change and air pollution, and natural disasters.

Geothermal energy through the GEMex project and welcomed the progress made on Clean Energy Materials Challenge through the Mission Innovation flagship initiative as a shared commitment, with international collaboration encouraged on commonly identified innovation challenges.

Health research: Both sides expressed the need to continue addressing health challenges, mainly through multilateral initiatives such as in the areas of chronic and infectious disease. CONACYT agreed to consider the possibility to join the Joint Programming Initiative on Antimicrobial Resistance, and also the International Rare Diseases Research Consortium. The two sides agreed to encourage cooperation through the flagships on cancer

[3] For more information, please consult this website in view of submitting applications: http://www.conacyt.mx/index.php/el-conacyt/convocatorias-y-resultados-conacyt/convocatoria-conacyt-horizon2020

research and personalized medicine.

The EU side acknowledges CONACYT's willingness to participate in the flagships on **Nanosafety and Technologies for Global Health Care** (safety of medical devices) as well as contribute to the development of the guidelines of the "Malta Project" which involves EU Member States, OECD and the European Chemicals Agency (ECHA). Furthermore, the EU side welcomed the intention of Mexico to join the EU Observatory for Nanomaterials.

The two sides agreed to encourage cooperation on R&D and demonstrations under the **two Transport flagships** in clean urban transport and logistics intended to develop large scale demonstrations of low-carbon transport solutions (in particular in the field of electro mobility) in medium size cities and mega-cities.

Mexico expressed a strong interest in cooperating in the field of **aeronautics** and both parties agreed to explore further the areas of common interest for future collaboration.

Both sides pledged to encourage cooperation between European and Mexican research centres under the **Climate and Resource Efficiency** challenge and ensure participation in the flagships on nature-based solutions and sustainable urbanisation, as well as climate change impacts on biodiversity and ecosystem services. Further increased cooperation through multilateral platforms is also encouraged such as the Belmont Forum and the Group on Earth Observations (GEO).

Both parties also recognized the consolidation of the **EU-LAC partnership in R&I under the Common Research Area** and ensure greater access of Mexico to pan-European research infrastructures of global nature as well as consolidating Mexico's leading role in helping to defining the scope of the Research Infrastructures working group as well as in the sustainable urbanisation task force.

Other cooperative activities:

- **An Implementing Arrangement between the European Research Council (ERC) and CONACYT** was signed on the occasion of the visit of Commissioner Moedas to Mexico in November 2015 and it represents an important stepping stone in the S&T relations with Mexico. This agreement wil**l stimulate collaboration in frontier research by facilitating excellence-based and bottom-up research cooperation among high-calibre Mexican and European scientists.** Through this new initiative at least 4 Mexican researchers will be offered the possibility to undertake single (6-12 months) long-term or multiple short term research visits (e.g. for joint experiments), becoming part of teams led by ERC grant holders in Europe starting end of 2018.

- In the area of **social sciences and humanities**, Mexico have a strong involvement is the Trans-Atlantic Platform (T-AP) dealing with social sciences and humanities. The EU funded T-AP initiative is a collaboration between key humanities and social science funders from South America, North America, and Europe. The Platform facilitates the formation of networks within the social sciences and humanities and helps to heighten awareness of the crucial role the social sciences and humanities play in addressing 21st century challenges.

- As part of the **Enterprise Europe Network**, Mexico has set up the Enterprise Mexico Network. The Mexican hub of this initiative is managed by the consortium Promexico -Tech de Monterrey - CONACYT that connects Mexican small businesses and researchers to qualified global opportunities, facilitates international partnerships and creates trade through access to public and private sector resources. They do not receive any fund for this initiative but have access to the EEN which provides information on events and has a database of European and international companies in different economic sectors.

ANNEX:

HORIZON 2020 WORK PROGRAMME 2018-20 TOPICS EXPLICITLY ENCOURAGING COOPERATION WITH MEXICO

	Topic identifier	Topic title
2018	FETHPC-01-2018	HPC PPP - International Cooperation on HPC
	INFRAIA-01-2018-2019	Integrating Activities for Advanced Communities
	INFRASUPP-01-2018-2019	Policy and international cooperation measures for research infrastructures
	LC-MG-1-1-2018	InCo flagship on reduction of transport impact on air quality
	SC1-BHC-18-2018	Translational collaborative cancer research between Europe and the Community of Latin American and Caribbean States (CELAC)
	SC1-HCO-01-2018-2019-2020	Actions in support of the International Consortium for Personalised Medicine
	SC1-HCO-06-2018	Establishment of an International Network of Social Sciences Research Centres to help address governance and other challenges in the preparedness for and the response to infectious threats
	SC1-BHC-15-2018	New anti-infective agents for prevention and/or treatment of neglected infectious diseases (NID)
	SC1-BHC-16-2018	Global Alliance for Chronic Diseases (GACD) - Scaling-up of evidence-based health interventions at population level for the prevention, detection, and management of hypertension and/or diabetes
	SC5-13-2018-2019	Strengthening international cooperation on sustainable urbanisation: nature-based solutions for restoration and rehabilitation of urban ecosystems
	SC5-17-2018	Towards operational forecasting of earthquakes and early warning capacity for more resilient societies
	BG-08-2018-19	All Atlantic Ocean Research Alliance Flagship
	SFS-32-2018	Supporting microbiome coordination and the International Bioeconomy

		Forum
2019	MG-2-9-2019	Integrated multimodal, low-emission freight transport systems and logistics
	LC-CLA-06-2019	Inter-relations between climate change, biodiversity and ecosystem services
	LC-GV-05-2019	InCo flagship on “Urban mobility and sustainable electrification in large urban areas in developing and emerging economies”

Figure 3: Mexico – Top scientific areas compared to EU28 in terms of citation impact of publications

	Scientific Area	Share in world output	Share of international co-publications	Citation Impact Difference with EU28	8-year trend
High publication output	Medicine: General Medicine	0,5%	37%	+0.25	↑
	Medicine: Immunology and Allergy	0,9%	43%	+0.24	↑
	Immunology and Microbiology: Immunology	0,7%	48%	+0.07	↑
	Engineering: Industrial and Manufacturing Engineering	0,7%	38%	-0.1	↑
	Energy: Energy Engineering and Power Technology	0,6%	32%	-0.14	↑
	Mathematics: Theoretical Computer Science	0,9%	37%	-0.19	↑
	Energy: Renewable Energy, Sustainability and the Environment	0,8%	35%	-0.2	–
	Chemistry: Organic Chemistry	0,8%	32%	-0.23	↑
	Chemical Engineering: General Chemical Engineering	1,0%	36%	-0.23	↑
	Environmental Science: Environmental Engineering	0,9%	37%	-0.24	↑
Low publication output	Social Sciences: Library and Information Sciences	0,5%	35%	+1.53	↑
	Social Sciences: Law	0,3%	22%	+1.01	–
	Medicine: Pharmacology (medical)	0,3%	58%	+0.93	↑
	Nursing: General Nursing	0,3%	48%	+0.77	↑
	Medicine: Rheumatology	1,3%	43%	+0.71	↑
	Medicine: Critical Care and Intensive Care Medicine	0,2%	48%	+0.6	–
	Pharmacology, Toxicology and Pharmaceutics: General	0,3%	55%	+0.41	–
	Business, Management and Accounting: Strategy and Management	0,5%	44%	+0.38	↑
	Medicine: Health Policy	0,4%	50%	+0.33	–
	Medicine: Geriatrics and Gerontology	0,4%	54%	+0.33	–

Source: DG Research and Innovation – International Cooperation
Data: Elsevier SciVal; extraction date: 6/8/2017; publications' window: 2011-2013; citations' window: 3 years
Note: These tables show scientific areas in which the country's academic publications have a higher citation impact than EU28, and whether this difference has decreased, increased or remained the same in the past 8 years. They are grouped in two tables. The top table focuses on areas with high share of publications in the country's total output of publications and the bottom table on those with low share of publications. Scientific areas are based on Elsevier 'All Science Journal Classification'. For each area, the country's share in the world output of publications and the share of international co-publications are also shown.

Figure 4: Mexico – Specialisation compared to EU28 in selected technologies based on PCT patents

	Technology	2014 PCT patents	2014 PCT patents of EU28	2014 Specialisation compared to EU28	8-year trend
OECD classification	Nanotechnology	5	137	6,23	↑
	Pharmaceuticals	27	2.524	1,81	–
	Selected environment-related technologies	28	3.663	1,32	↑
	Biotechnology	16	2.745	0,97	↑
	Medical technology	21	3.879	0,93	↓
	ICT	54	14.579	0,63	↑
WIPO classification	Food chemistry	12	484	4,68	–
	IT methods for management	8	425	3,55	–
	Materials, metallurgy	16	939	3,22	–
	Control	10	784	2,41	↑
	Micro-structural and nano-technology	1	86	2,19	–
	Basic communication processes	3	268	2,11	–
	Environmental technology	8	716	2,11	↑
	Surface technology, coating	7	635	2,08	↑
	Furniture, games	10	952	1,98	↓
	Organic fine chemistry	14	1.595	1,66	↑
	Biotechnology	11	1.400	1,48	↑
	Pharmaceuticals	12	1.581	1,43	↑
	Thermal processes and apparatus	6	791	1,43	↑

Source: DG Research and Innovation – International Cooperation
Data: OECD (top table) WIPO (bottom table); extraction date: 6/8/2017
Note: The top table shows the relative specialisation of the 2014 PCT patent output of the country with respect to EU28, calculated as (# of patents of country in technology X / # of patents of country in all technologies) / (# of patents of EU28 in technology X / # of patents of EU28 in all technologies). It also shows whether the relative specialisation has increased, decreased or remained the same in the past 8 years. The selected technologies are classified based on the OECD database. The bottom table shows the same information for the top-13 technologies with the highest specialisation index with respect to EU28 - this time the technology classification is based on the WIPO database. Both tables also show the country's and EU28 total number of PCT patents under a certain technology in 2014.