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Mexican Talent

for economic growth and nearshoring

Secretariat of Economy
Undersecretariat of Foreign Trade
Global Economic Intelligence Unit

In colaboration with
Secretariat of Public Education
Secretariat of Labor and Social Welfare
National Council for the Humanities, Sciences and Technologies

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"Mexican talent for economic growth and nearshoring"

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Mexican talent

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INTRODUCTION

Mexico is a young and hardworking country. Its population is around 29 years old, and it ranks tenth in the list of the most populated countries.

Mexican Talent for Economic Growth and Nearshoring is an initiative of the Government to show with granular and geo-referenced data that **in our country we have the professional and specialized profiles required by companies** seeking to invest in Mexico or relocate their production to North America.

The country has committed to education to make the most of its demographic bonus. Mexico's labor force is characterized by being increasingly better qualified. From 2000 to 2020, the average schooling of Mexican people increased from 7.5 to 9.7 years.

To ensure that this trend continues to grow and that socioeconomic factors are not a hindrance to study, in 2022, the current administration provided scholarships to more than 10 million students, representing an investment of more than $2.2 billion dollars.

In higher education alone, the federal government in 2023 allocates around $9.1 billion dollars. Currently, the public system has 1,335 undergraduate programs related to information technology, engineering, manufacturing, and construction, which are attractive for relocating supply chains in North America.

Likewise, each year, a little more than 451 thousand undergraduates, graduate, and postgraduate students finish their studies in the public system (not including the Subsystem of Teacher Training Institutions and their schools). Of these, 37.5 % studied one of the Science, Technology, Mathematics, and Engineering (STEM) disciplines. Mexico is the second country with the most engineers in the list of the countries belonging to the Organization for Economic Cooperation and Development (OECD).

In 2021, 407 thousand students graduated from technical and technological secondary education in 246 careers.

Faced with the rapid changes in global supply chains, the education system is in constant dialogue with the economic sectors to update and ensure the relevance of curricula in line with technological and productive innovations.

Note: According to the Mexican classification of curricula by academic training fields 2016 of the National Institute of Statistics and Geography (INEGI), STEM disciplines include the detailed areas of natural sciences, mathematics, and statistics; engineering, manufacturing, and construction; and information and communication technologies.

Mexican workforce was considered one of the ten most attractive in 2022 by the Total Workforce Index, thanks to its high availability, efficiency, progressive regulatory frameworks, and productivity improvements.

Our talent lays the groundwork for Mexico to consolidate its transition to producing more specialized goods and services that generate higher-paying jobs.

Mexico is **one of the ten countries attracting the largest levels of foreign investment**, which shows that nearshoring is not a future project but a reality. In addition to other factors such as geographical position, political stability, and the Trade Agreement with the United States and Canada (USMCA), this is primarily explained by the competitiveness of the Mexican labor force.

WHAT YOU SHOULD KNOW ABOUT MEXICAN TALENT

Talent is Mexico's strength to take advantage of nearshoring. Young technicians and specialists in STEM areas are the keys to raising productivity and competitiveness levels in industries, thus improving resilience in supply chains.

Mexican talent is:

Young
Around 2 million young workers will enter the labor market annually over the next five years.

One of the largest in the world
Mexico ranks first among OECD countries with the highest number of young technical and technological graduates and third with the third highest number of professional graduates.

Specialized in STEM areas
Mexico has the largest pool of STEM graduates in the American continent. The National Autonomous University of Mexico, the National Polytechnic Institute, and the National Technological Institute of Mexico are the key institutions for nation's talent pool in STEM.

Focused on scientific research and innovation, and technological development
We have 50 research centers and laboratories with frontier research to drive innovation in electrical and electronics, semiconductors, automotive and electromobility, medical devices and pharmaceuticals, and agribusiness.

Collaborating with the industry
Through dual education, multinational companies, especially in the automotive sector, reduce hiring costs and attract the best talent from the local community.

1

Talent in the public education system

TECHNICAL EDUCATION

Technical education is a competitive advantage of Mexico for nearshoring. **Mexico's technical and technological system at secondary education level is one of the largest in the world**, is linked to the private sector, and specializes in crucial industries for economic growth.

The technical education talent pool in Mexico is:

Twice the size of Brazil

Higher secondary education has three educational models: general or propedeutic, technological, and professional-technical. Different subsystems operate those models. In the technological and technical secondary level, students between 15 and 17 years pursue technical careers focused on: the industrial, service, commerce, agriculture, fishing, and forestry fields.

According to the Secretariat of Public Education (SEP), the estimated number of technical graduates increased to 407 thousand people in 2021-2022. Of these:

21 % come from Programming, Computer Support, and Systems Maintenance Careers.

8 % graduate from careers related to Electromechanics, Automotive Industry, Motors, and Industrial Maintenance.

Mexico is among the five OECD economies that allocate the largest public budget to secondary education level.

Students enrolled in technical education in OECD countries 2020

1st place OECD **Mexico has 1.7 million enrolled students**

2nd Germany	1.1 million
3rd Brazil	800 thousand
4th Poland	796 thousand
5th Spain	313 thousand
6th Taiwan	244 thousand
7th Korea	121 thousand

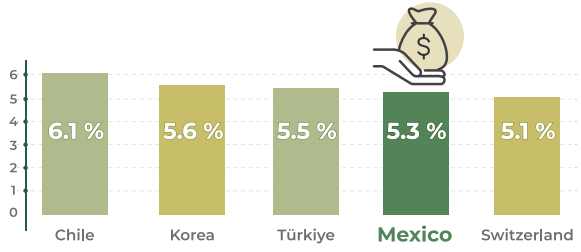
Graduates in technical education in OECD countries 2020

1st place OECD **Mexico 400 thousand graduates**

2th Germany	298 thousand
3th Taiwan	191 thousand
4th Spain	152 thousand
5th Poland	143 thousand
6th Brazil	129 thousand
7th Korea	46 thousand

Source: Elaborated by Secretariat of Economics with data provided by OECD, 2020.
Note: The data for Taiwan was extracted from the statistical yearbook of the Republic of China 2021, edited in 2022.

Total public spending on secondary education level as a percentage of total education budget



Source: Elaborated by Secretariat of Economics with data provided by OECD, 2019

Note: Technical education at the secondary level is composed of the following subsystems: General Directorate of Industrial and Service Technological Education (DGETI), College of Scientific and Technological Studies (CECyTEs), General Directorate of Agricultural and Livestock Technological Education and Marine Sciences (DGETAyCM) and the National College of Technical Professional Education (Conalep).

OVERVIEW OF TECHNICAL EDUCATION

School Year 2021-2022

Enrollment
1.8 million

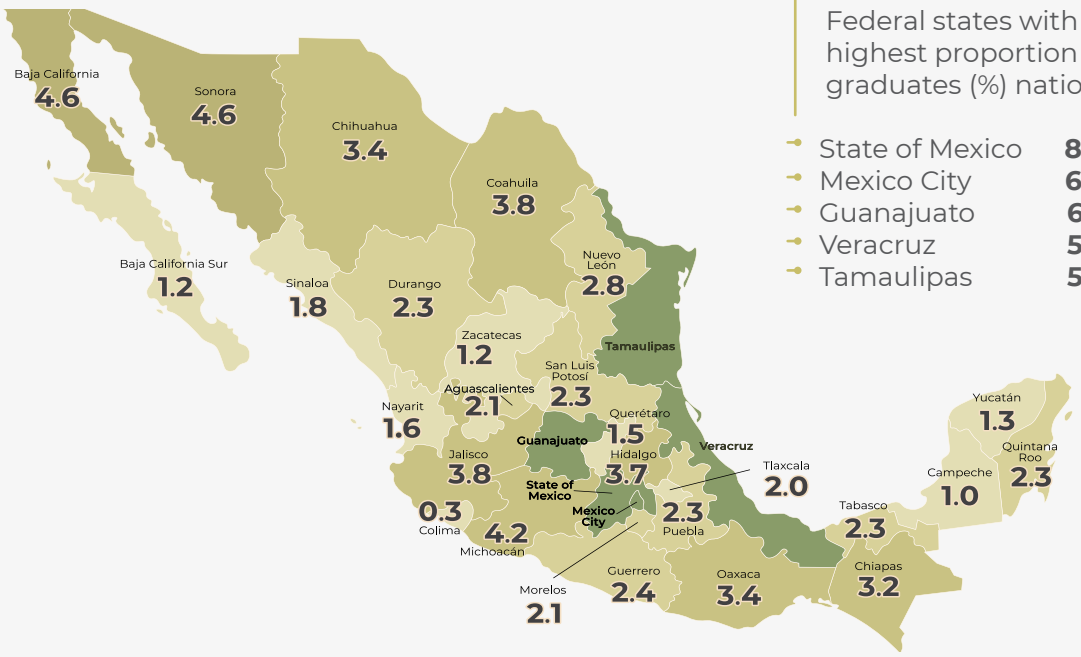
Graduation
407,000

Source: Estimations provided by Secretariat of Public Education.

In Mexico, there are a more significant number of young technical graduates than in:

Source: Data provided by OECD, 2020.

Percentage distribution (%) of technical education graduates (2021-2022)



TOP 5

Federal states with the highest proportion of graduates (%) nationwide:

State of Mexico	8.1
Mexico City	6.7
Guanajuato	6.4
Veracruz	5.7
Tamaulipas	5.3

Source: Elaborated by Secretariat of Economy with estimations provided by Secretariat of Public Education, 2021-2022.
Note: Estimation based on the National Survey 911 of the Secretariat of Education, using data from 2016-2017 to 2020-2021.

Technical education for strategic industries

Electronics
124,000

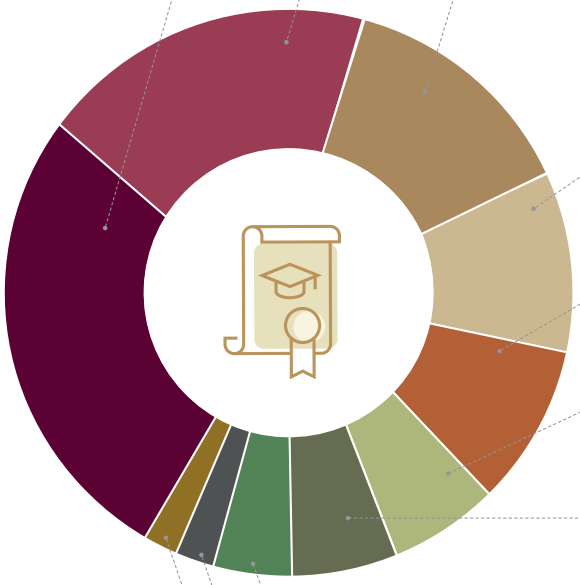
graduates in careers related to
computer science, electronics, programming, electricity, and computer equipment support, and maintenance.

Automotive
55,000

graduates in careers related to
electromechanics, mechatronics, industrial maintenance, automotive maintenance and refrigeration, and air conditioning.

Note: The number of graduates for 2021-2022 was estimated through a statistical projection exercise based on a linear regression developed by the Secretariat of Public Education.

Graduated technical talent available for nearshoring classified by the North American Industrial Classification System (2021 - 2022)



25.4 % Professional, scientific, and technical services	**103,364** in careers such as Accounting, Computer Science and Industrial Chemistry	Mexico City, State of Mexico, Guanajuato
18.6 % Other services except for governmental activities (Repair and maintenance services)	**75,687** in careers such as Support and Maintenance of Computer Equipment, Electronics and Automotive Maintenance	Guanajuato, State of Mexico, Tamaulipas
13.3 % Manufacturing industries	**54,079** in careers such as Mechatronics, Industrial Food Production and Electricity	Guanajuato, Coahuila, Veracruz
10.1 % Information in mass media	**41,013** in careers such as Programming, Media and Media and Software Programmer	State of Mexico, Tamaulipas, Sonora
8.9 % Health and Social Assistance Services	**36,047** in careers such as Clinical Laboratory, Nursing and Radiology	Mexico City, State of Mexico, Chiapas
5.8 % Business support services, waste management, and remediation services	**23,564** in careers such as Human Resources Management, Trilingual Tour Guide and Technology Human Resources	Mexico City, Tamaulipas, Chihuahua
5.1 % Agriculture, farming, forestry, fishing, and hunting	**20,703** in careers such as Agricultural Technician, Livestock Farming Technician and Forestry Technician	Michoacán, Veracruz, Guerrero
4.1 % Temporary accommodation services and food and beverage preparation services	**16,816** in careers such as Food and Beverage Preparation and Hotel Services	Quintana Roo, Baja California, Mexico City
2.1 % Transportation, mail, and warehousing	**8,379** in careers such as Logistics, Naval Mechanic Technician and Shipbuilding and Repair Technician	Veracruz, Tamaulipas, Oaxaca
1.6 % Construction	**6,503** in careers such as Construction and Decorative Design	Veracruz, Chiapas, Hidalgo
5.0 % Others	**20,852** in careers such as Ecotourism, Organizational Development and Tourism Hospitality	State of Mexico, Chiapas, Guanajuato

Source: Elaborated by Secretariat of Economy with estimations provided by Secretariat of Public Education.

PROFESSIONAL EDUCATION

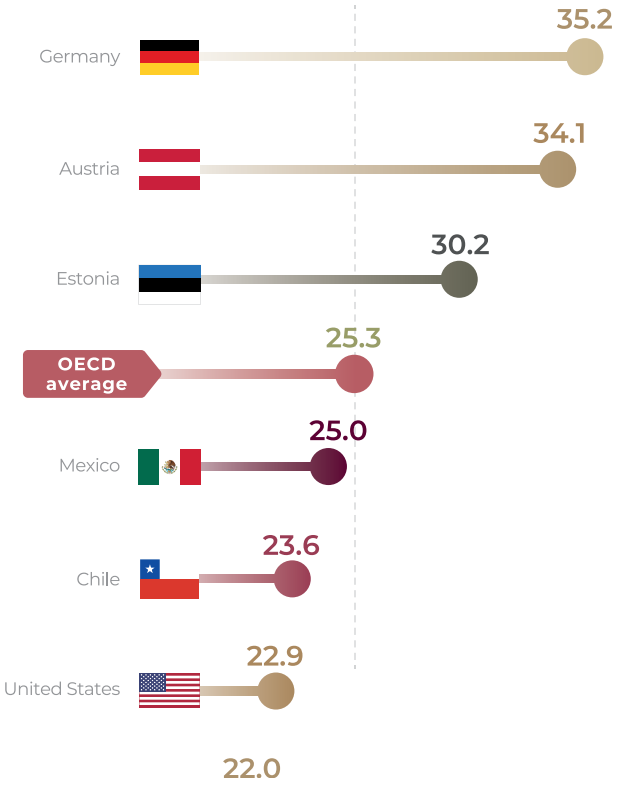
Mexico's universities and institutions of higher education have strengths that attract innovative industries looking to relocate to the country, among them:

- Large pool of graduates in STEM careers.
- Installed infrastructure for frontier research.[1]

The proportion of the population in Mexico focused on STEM careers is the highest of the OECD countries in the American continent. 25 % of people between 25 and 64 years of age with higher education have this specialty.

National Polytechnic Institute (IPN) has
9,000 STEM graduates per year

Share of adults (25-64 years old) with STEM degrees in higher education population in OECD countries (2021)



Source: Elaborated by Secretariat of Economy with data provided by OECD statistics, 2021.

In the United States, between 4 and 6 thousand people graduate each year from universities such as the University of Pennsylvania, the University of California-Berkeley, Texas A&M University, Arizona State University, and the University of California San Diego.

Considering the population of higher education graduates, **Mexico is among the seven OECD countries with the largest proportion of STEM graduates**.[2] Above are countries such as Chile, Canada, the United States, Poland, and Spain.

[1] According to Conahcyt, frontier research uses atypical methodologies and concepts. Promoting advances in frontier science is essential to strengthening a country's technical independence and sovereignty.
[2] According to OECD data, in 2020, 27.2% of Mexico's higher education graduates came from STEM careers.

In 2021-2022, **169 thousand of people specialized in STEM careers graduated** from the public system. Of this population; 70.6 % focus on engineering, manufacturing, and construction; 17.6 % on information and communication technologies and; 11.8 % on natural sciences.

Mexico's engineering supply mainly focuses on electronics, industrial, mechanical, construction, and chemical processes. In 2021, more than 83,000 engineers graduated in these areas (69.5 % of the total engineering supply).

STEM graduates at the undergraduate and graduate levels

The majority of STEM talent comes from the country's central region (Mexico City, State of Mexico, and Morelos). This is followed by the eastern part (Hidalgo, Puebla, Tlaxcala, and Veracruz) and, in third place, the central-northern region (Aguascalientes, Guanajuato, Querétaro, San Luis Potosí and Zacatecas).

Source: Elaborated by Secretariat of Economy with data provided by Secretariat of Public Education.

OVERVIEW OF PROFESSIONAL AND POSTGRADUATE EDUCATION

2021-2022 school year

Enrollment
3.1 million

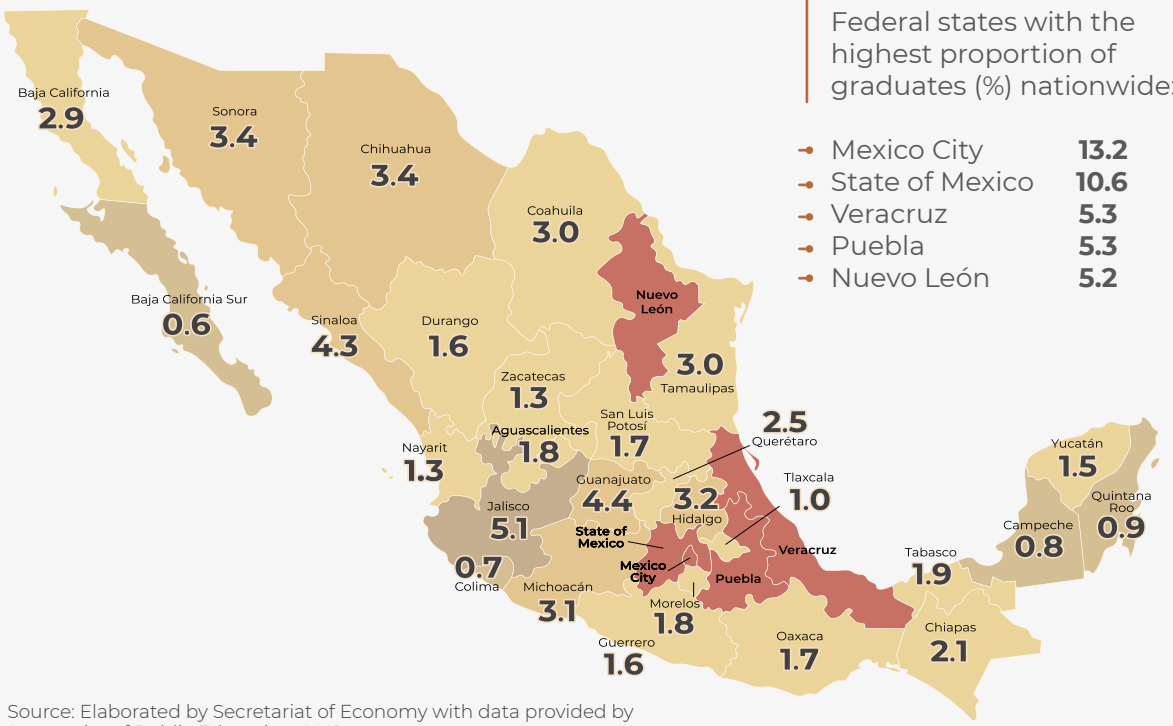
Graduation
451,000

Source: With data provided by Secretariat of Public Education.

Mexico is the fourth OECD country with the largest
number of students enrolled and the third with the largest number of graduates.

Source: Data provided by OECD, 2020.

Percentage distribution (%) of graduates in higher education (2021-2022)



TOP 5

Federal states with the highest proportion of graduates (%) nationwide:

Mexico City	13.2
State of Mexico	10.6
Veracruz	5.3
Puebla	5.3
Nuevo León	5.2

Source: Elaborated by Secretariat of Economy with data provided by Secretariat of Public Education, 2021.

State Public Universities

37.9%

of the talent supply comes from the State Public Universities (UPES, by its acronym in Spanish)

Nuevo León, Jalisco and Sinaloa account for **28.9 % of the graduates** of these universities.

Note: Data excludes private higher education institutions, the Teacher Training Institutions, and the Teacher Training Institutions Subsystem.

NATIONAL TECHNOLOGICAL INSTITUTE OF MEXICO

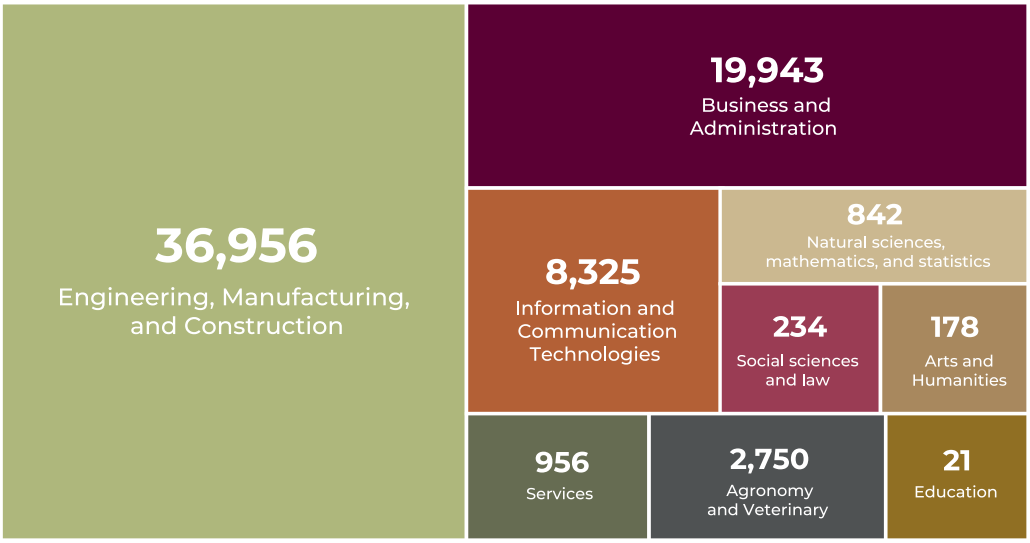
The National Technology of Mexico (TecNM, by its acronym in Spanish) is the institution of higher education with the most significant territorial presence in Mexico. It concentrates **12.9 % of the higher education enrollment in Mexico** (almost one out of every eight higher education students attends a program at TecNM) and **annually trains 41.0 % of the engineers in the country**.

TecNM's coverage includes 32 states through 248 institutes. This educational institution is relevant to the industry because its innovation centers focus on the aerospace sector, located in Baja California, Chihuahua, and Aguascalientes; and automotive industry located in State of Mexico and Puebla.

To promote the technological development of semiconductors, the TecNM created the **National Coordination for the Technological Development of Semiconductors**. Whose objective is to train talent specialized in semiconductor design. To this end, it has designed the following programs:

- Basic Diploma: aimed at the TecNM community, TecNM graduates, and the general public. It starts in May 2023.
- The specialization at the postgraduate level: TecNM graduates and the general public with specific profiles. It starts in August 2023.
- New TecNM bachelor's degree program: Semiconductor Engineering. It starts in August 2023.
- Specialties for the last year of training of TecNM students in related careers. It starts in August 2023.

Distribution of TecNM graduates by broad field (2021-2022)



Source: Elaborated by Secretariat of Economy with data provided by Secretariat of Public Education.

BILINGUAL, INTERNATIONAL, AND SUSTAINABLE EDUCATIONAL OPTIONS AT TECHNOLOGICAL AND POLYTECHNIC UNIVERSITIES

Technological and polytechnic universities offer a bilingual, international, and sustainable education option.[3] In the BIS universities, as the institutions with this option are called, the student population take their technical and human development subjects in English.

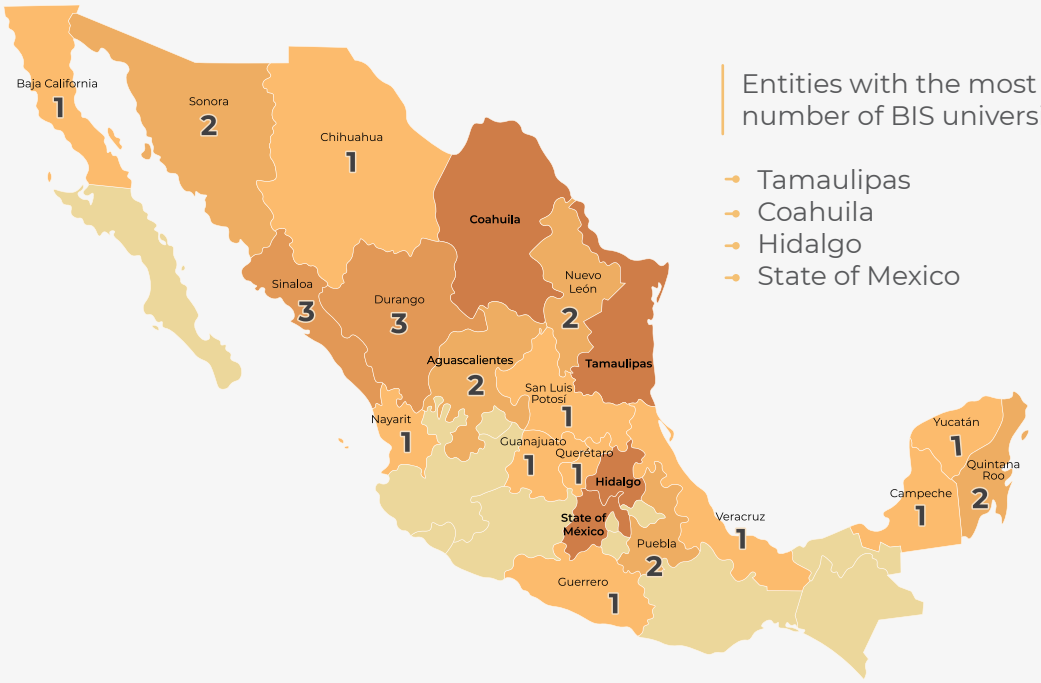
Thus, **the talent trained at BIS universities understands the English language, as well the technical concepts specific to the career they studied**. In the case of students who enter BIS Universities with a B2 level of English, certified and valid with an internationally valuable instrument, the university offers an additional language linked to the needs of the productive sector of the region where the institution is located.

For this reason, the universities also offer languages such as French, Japanese, or German.

46 **Universities offer the BIS option.**
focused mainly in the fields of:

- Engineering, Manufacturing, and Construction
- Business and Administration
- Information Technology
- Services

Entities with Bilingual, International, and Sustainable (BIS) education campuses



Entities with the most significant number of BIS universities

Tamaulipas	7
Coahuila	5
Hidalgo	4
State of Mexico	4

Source: Elaborated by Secretariat of Economy with data provided by the Secretariat of Public Education
[3]"Bilingual, International and Sustainable Educational Option (BIS)", Secretariat of Public Education, 2023.

POSTGRADUATE, SCIENCE AND TECHNOLOGY

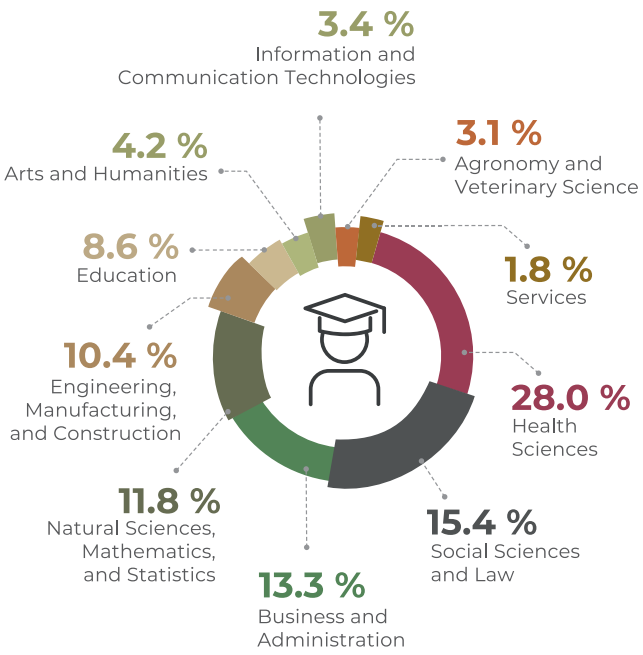
In addition to supporting the development of research competencies, postgraduate programs in Mexico are also an instrument of collaboration with industry to train company workforce. **The National Council for the Humanities, Sciences and Technologies (Conahcyt)** has doctoral, master's, or specialty programs in the **Programs with Industry modality**.

After the medicine field, in Mexico, most postgraduate graduates focus on law, administration, biochemistry and biophysics programs, and agricultural production.

In terms of research and development, there are currently collaborations between the Conahcyt and companies in strategic industries for frontier research and technological development and innovation in predominant themes for nearshoring, for example:

In November 2022, the National Institute of Astrophysics, Optics, and Electronics (INAOE) confirmed that it would join the semiconductor supply strategy promoted by the governments of Mexico and the United States in collaboration with manufacturing companies.

Distribution of postgraduate graduates by field of knowledge (2021)



Source: Elaborated by Secretariat of Economy with data provided by Secretariat of Public Education, 2021.

Graduate programs and infrastructure for scientific research and development

50

research centers and public laboratories

There are about **2,000 programs** with **38,000 graduates**, mainly in health sciences, social sciences and law, and business and administration.

2

Talent for strategic industries

ELECTRIC AND ELECTRONIC

Mexico is a highly attractive country for the electrical and electronic industries.

Proof of this is the high-tech transnational companies here, such as Intel, Flextronics, Lenovo, Samsung, and Foxconn. Mexico is the fifth largest global supplier of household appliances.[4]

To meet the demand for talent in this industry, dual education offers careers in **electronic systems maintenance** in entities such as Chihuahua, Mexico City, Coahuila, Hidalgo, Puebla, Tamaulipas, and Veracruz. At higher level, due to their vastly level of graduates, the careers of Information Technology and Digital Network Infrastructure Areas stand out.

Technical graduates for industry (2021-2022)*

8,000 youth

Electricity and Industrial Electricity

mainly in Veracruz, Sonora, and Mexico City.

10,000 youth

Mechatronics

mainly in Guanajuato, Coahuila and Baja California.

2,000 youth

Electronic Systems Maintenance

mainly in Mexico City, Coahuila and Nuevo Leon.

Graduates related to electrical and electronic industries (2021-2022)

Includes careers such as:

- Computer Systems Engineering
- Information Technology Engineering
- Electronics Engineering
- Computer Engineering

They are located mainly in Veracruz, State of Mexico, Mexico City, Michoacán, Puebla, Morelos and Aguascalientes.

28,356
Bachelor

4,709
Higher Technical University (TSU)

Includes careers such as:

- Information Technologies, Virtual Environments, and Digital Business Area
- Information and Communication Technologies Information Systems Area
- Information Technologies Digital Network Infrastructure Area

They are located mainly in State of Mexico, Nuevo Leon, Guanajuato, Hidalgo, Guerrero, Puebla, Chihuahua and Coahuila.

1,677
Master's Degree

Includes careers such as:

- Degree in Computer Systems
- Degree in Electrical Engineering
- Science in Electrical Engineering
- Degree in Computer Science

They are located mainly in Guerrero, Puebla, Veracruz, Mexico City, Coahuila, Jalisco and Tamaulipas.

Source: Elaborated by Secretariat of Economy with data provided by Secretariat of Public Education, 2021.

*Note: The number of technical graduates for 2021 - 2022 was estimated through a statistical projection exercise prepared by the Secretariat of Public Education.

[4] "Mexico, 5th place as a global home appliance supplier", *Clúster de Electrodomésticos (CLELAC)*, (2023).

SEMICONDUCTORS

Mexico has the opportunity to join the global semiconductor value chain for the following principal reasons:

1. Geographic proximity to the United States
2. The current presence of at least 600 companies with participation in the global value chain.
3. High supply of STEM talent
4. Consolidated infrastructure and talent in public research institutions

Among the research and technological infrastructure, three public centers stand out. **The Center for Research in Advanced Materials (CIMAV, by its acronym in Spanish)** with facilities in Nuevo León and Durango and whose research areas are Physics, Chemistry, and Computational.

For microtechnology, Mexico has the **Center for Engineering and Industrial Development (CIDESI, by its acronym in Spanish)**. This laboratory in Cuautitlán Izcalli, State of Mexico, focuses on **developing semiconductor devices**. Research ranges from the development to the packaging.

Within the line of research in Microelectronics of the **National Institute for Astrophysics, Optics, and Electronics (INAOE, by its acronym in Spanish)** includes modeling, designing, fabricating, and characterizing semiconductor devices and microelectromechanical systems (MEMS).

Specialized talent and linkage to the semiconductor industry

Mexico City

Cinvestav

Center for Research and Advanced Studies of the IPN (CINVESTAV)

- At CINVESTAV, the Solid State Electronics section is an international reference on High Scale Integration circuits, Semiconductors and Nanotechnology.
- It has Ph.D. researchers and offers masters and doctoral degrees.

Puebla

BUAP

Meritorious Autonomous University of Puebla (BUAP)

- BUAP's Semiconductor Devices Research Center is working on optics and electronic prototypes.
- Offers masters and Ph.D. degrees in semiconductor devices.

Puebla

INAOE

National Institute for Astrophysics, Optics, and Electronics (INAOE)

- Four lines of research in electronics:
  - Microelectronics
  - Integrated Circuit Design
  - Electronic Instrumentation
  - Communications

MOTOR VEHICLES AND ELECTROMOBILITY

The automotive sector is fundamental to the sustainability of the Mexican economy and our foreign trade.

- Mexico is the seventh largest vehicle manufacturer in the world and ranks the first place in Latin America.[5]
- It is the fifth largest exporter of auto parts[6] and the leading supplier of auto parts to the United States.[7]

Thanks to the talent that Mexico has, the motor vehicle and auto parts factories located here have become strategic lines of operation for multinationals.

Ford has consolidated five critical areas for its worldwide operation (e.g., product development or the Global Technology and Business Center), and BMW chose its plant in San Luis Potosi to produce high-voltage batteries.

The transition to electromobility has prompted updating curricula at the technical level.

Since 2020, the National College of Technical Professional Education (Conalep) has had a **technical course** designed in collaboration with the private sector **to convert vehicles from internal combustion engines to electric**, verifying the operation and adjustment of the different components. Nearly one thousand students have graduated from the State of Mexico.

The automotive companies are looking for a supply of professionals and specialists in the sector, they can count on around 13,000 graduates per year.

Outstanding industry collaborations since 2020

- Conalep in Coahuila integrated subjects in the Autotronics, and Industrial Maintenance careers, in conjunction with General Motors and John Deere.
- Conalep designed the Automotive Industry career to meet the requirements of the sector in the Bajio region (Querétaro and Guanajuato).
- MG Motor and UNAM outlined courses for Electrical Technicians, Technicians, and High Voltage Experts certifications.

Graduates related to the automotive industry at a higher level (2021-2022)

Includes careers such as:

- Industrial Processes Automotive Area
- Automotive Electronics and Mechanics
- Automotive Mechanics

They are located mainly in Puebla, Guanajuato, Jalisco, Veracruz, Guerrero and Querétaro.

7,310
Higher Technical University (TSU)

Includes careers such as:

- Automotive Technology Engineering
- Mechanical and Automotive Engineering
- Automotive Design Engineering
- Electrical and Automation Engineering
- Electrical Engineering

They are located mainly in Querétaro, Guanajuato, San Luis Potosí and Michoacán.

13,299
Bachelor

[5] "Statistics by country/region", International Organization of Motor Vehicle Manufacturers (OICA), (2022).
[6] "Motor Vehicle Parts and Accessories", Data Mexico.
[7] *"Perspectivas de la industria automotriz en México", Industria Nacional de Autopartes, A.C. (INA)*, (2022).

Source: Elaborated by Secretariat of Economy with data provided by Secretariat of Public Education, 2021.

MEDICAL DEVICES AND PHARMACEUTICALS

Mexico is Latin America's second-largest pharmaceutical industry market and an essential producer of high-tech medicine.[8]

Our country is also the most important supplier of medical devices to the United States[9] and the seventh largest exporter of medical devices in the world.[10]

Through Conahcyt, **the medical device sector has a base of 4,122 graduate students** ready to contribute with new knowledge and developments in treatments, sensors, and the study of diseases. These graduate students are divided by:

- 1,419 with doctoral degree
- 1,949 with master's degree
- 754 with specialization

452 members of the National System of Researchers specialized in

- Emerging diseases and diseases of national importance
- Biotechnology
- Nanomaterials and nanotechnology
- New generation drugs
- Medical devices

In terms of infrastructure, Mexico has a network of nine laboratories and seven research centers, where medical device companies can have access to various medical equipment development projects such as high-flow towers, ventilators, sensors, monitors, radiological units, and software, among others.

Students related to the medical device industry (2021-2022)

Includes careers such as:
- Science in Biotechnology
- Biomedical Sciences
- Chemical Sciences
- Science

They are located mainly in Mexico City, Sonora, Jalisco, Guanajuato, Puebla, Veracruz and Sonora.

1,419
PhD

1,949
Master's Degree

Includes careers such as:
- Degree in Health Sciences
- Degree in Industrial Engineering
- Degree in Chemical Sciences
- Degree in Biochemical Sciences

They are located mainly in Mexico City, Veracruz, and Morelos.

Includes careers such as:
- Biotechnology Engineering
- Biochemical Engineering
- Industrial Processes and Operations Engineering
- Nanotechnology Engineering

452
Members of the National System of Researchers

They are located mainly in the State of Mexico, Guanajuato, Puebla, Michoacán, Hidalgo, Veracruz, and Sinaloa.

Source: Elaborated by Secretariat of Economy with data provided by Secretariat of Public Education, 2021.

[8] "The Mexican Pharmaceutical Industry", *Consejo Farmacéutico Mexicano (cfm)*.
[9] "Tenth edition of ExpoMED," National Chamber of the Pharmaceutical Industry (Canifarma).
[10] "United Nations World Trade Data," UN Comtrade Database, (2021).

AGRIBUSINESS

Mexico is the world's fourteenth-largest food producer and eighth-largest exporter.[11]

In recent years, the agrifood trade balance has recorded constant surpluses, especially in agricultural and fishery products and fruits and vegetables.

To meet the labor demand of agribusiness, technical education is provided by the General Directorate of Agricultural Technological Education and Marine Sciences (DGETAyCM), which trains young technicians mainly in the Agricultural System, Industrial Food Production, and Livestock Production Systems.

Likewise, companies can acquire professional talent through **the Industrial Food Processing and Food, and Beverage Preparation** careers at Conalep.

At the higher education level, careers such as **Engineering in Sustainable Agricultural Innovation** are offered in states such as Aguascalientes, Campeche, Chiapas, Oaxaca, Tabasco, and Veracruz. At the postgraduate level, there is the Master's Degree in **Agricultural Biological Sciences** in Nayarit, or the specialization in **Plant Biotechnology** offered in institutions located in Guanajuato and Yucatán.

DGETAyCM
Dirección General de Educación Tecnológica Agropecuaria y Ciencias del Mar

In 2021 graduated

55 thousand students

mainly from the states of Veracruz (8.1 %), Michoacán (6.4 %), and Sonora (5.9 %).

Today, Mexico has **nine public research centers**, and **eight Conahcyt national laboratories** dedicated on agriculture, for example:

- Food and Development Research Center (CIAD, by its acronym in Spanish) in Chihuahua conducts studies, advisories, consultancies, and services in agrifood, fishing, industrial, commercial, economic, and social fields.
- National Laboratory for Food Safety Research (LANIIA, by its acronym in Spanish) focuses in food safety and transnational environmental biomedicine.

Graduates related to agribusiness (2021-2022)

Includes careers such as:
- Agronomy Engineering
- Sustainable Agricultural Innovation Engineering

They are located mainly in Oaxaca, Veracruz, Jalisco, Michoacán, Zacatecas, Baja California, Puebla, and Guanajuato.

8,885
Bachelor's Degree

714
Master's Degree

Includes careers such as:
- Science with specialization in Plant Biotechnology
- Degree in Agricultural Sciences
- Science in Marine Resources Management

They are located mainly in Yucatan, Sinaloa, Baja California Sur, and Nayarit.

Source: Elaborated by Secretariat of Economy with data provided by Secretariat of Public Education.
[11]"Análisis de la Balanza Comercial Agroalimentaria de México", Secretaría de Agricultura y Desarrollo Rural (SADER), (2022).

3

Talent for long-term federal projects

SONORA PLAN

The Mexican government will make the state of Sonora the investment destination for industries related to green energy (solar, lithium, and natural gas) and electromobility. The first stage of the Sonora Plan consists of developing seven solar plants and constructing gas pipelines to export gas.

Semiconductor and electromobility courses and diplomas are being announced, as well as the first **Semiconductor Engineering** degree program at the University of Sonora.[12]

By 2023, lithium-related companies in Sonora will have access to a technical offer of 17,000 graduates.

At the postgraduate level, 84 % of the programs offered by Conahcyt cover fields related to environment, energy, renewable energies, sustainability, and semiconductors. Although these programs are distributed in different entities, 54 % are offered in the central and northwestern regions of the country.

Talent pool for Sonora Plan

32,000
technical and professional graduates per year

52 % in technical education

48 % of professional education

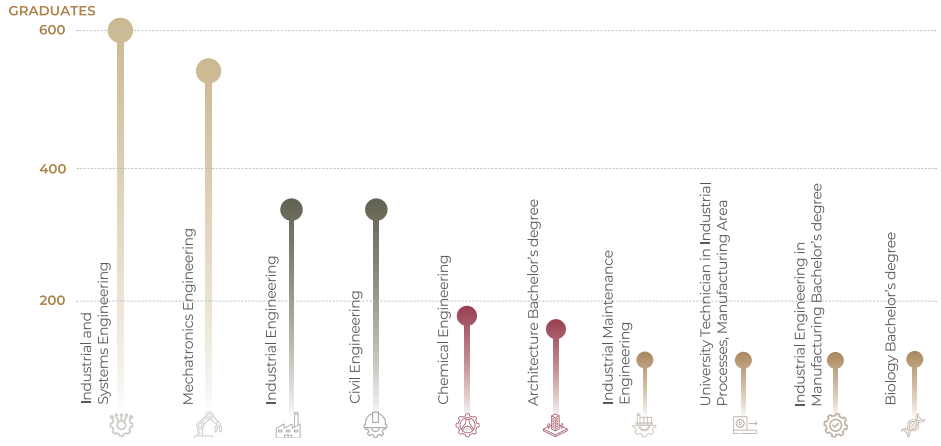
7.9 %
increase
of technical graduates from 2021 to 2026

Source: Elaborated by Secretariat of Economy with statistics from the Secretariat of Public Education, 2021.

To promote research related to the Sonora Plan, Mexico has around the country:

- 16 public research centers with lithium, solar energy, and gas capabilities.
- 6 national laboratories focused on energy.

Main careers and universities with the highest number of graduates in the fields of engineering, natural sciences, mathematics, statistics, and construction



27.1 %
University of Sonora

12.9 %
Sonora Institute of Technology

12.5 %
Technological University of Hermosillo

Source: Elaborated by Secretariat of Economy with statistics from the Secretariat of Public Education, 2021.

[12] "Stenographic version", Puerto Peñasco Photovoltaic Power Plant. Inauguration - first stage, Government of Mexico, 2023.

INTEROCEANIC CORRIDOR OF THE ISTHMUS OF TEHUANTEPEC

The region of the Interoceanic Corridor of the Isthmus of Tehuantepec (CIIT) covers the states of Veracruz and Oaxaca (12.2 million inhabitants, 9.7 % of the national population). The project includes:

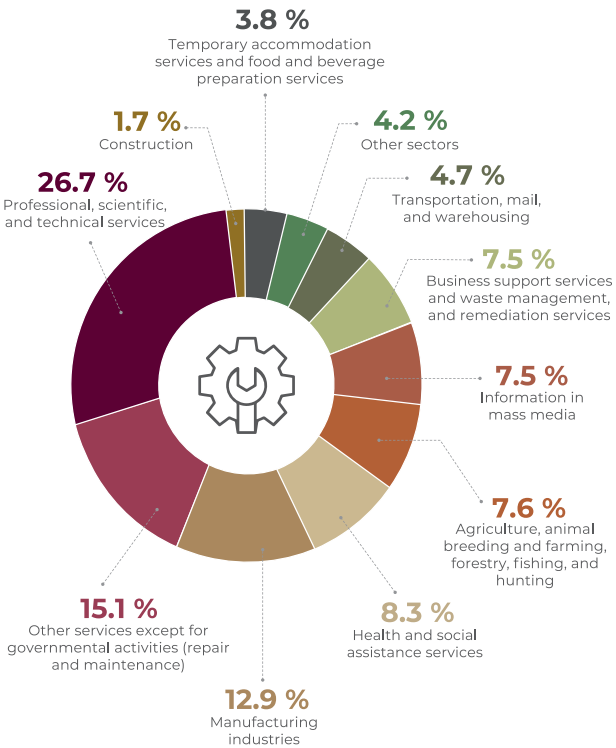
- The development of a logistics platform with rail transport interconnection in the ports of Salina Cruz (Oaxaca) and Coatzacoalcos (Veracruz).
- Construction of 10 industrial parks in four Veracruz municipalities and six Oaxaca locations.

Companies in the CIIT region have access to a **pool of 68 thousand technical and professional graduates**. Oaxaca and Veracruz account for 42 % of the technical talent in the south-southeast region. The career with the highest number of graduates, after Accounting, is Programming.

At the professional level, there is a supply of bachelor's degrees in Mechanical, Electrical, Electronic, and Chemical Engineering (8 thousand young graduates and postgraduates annually).

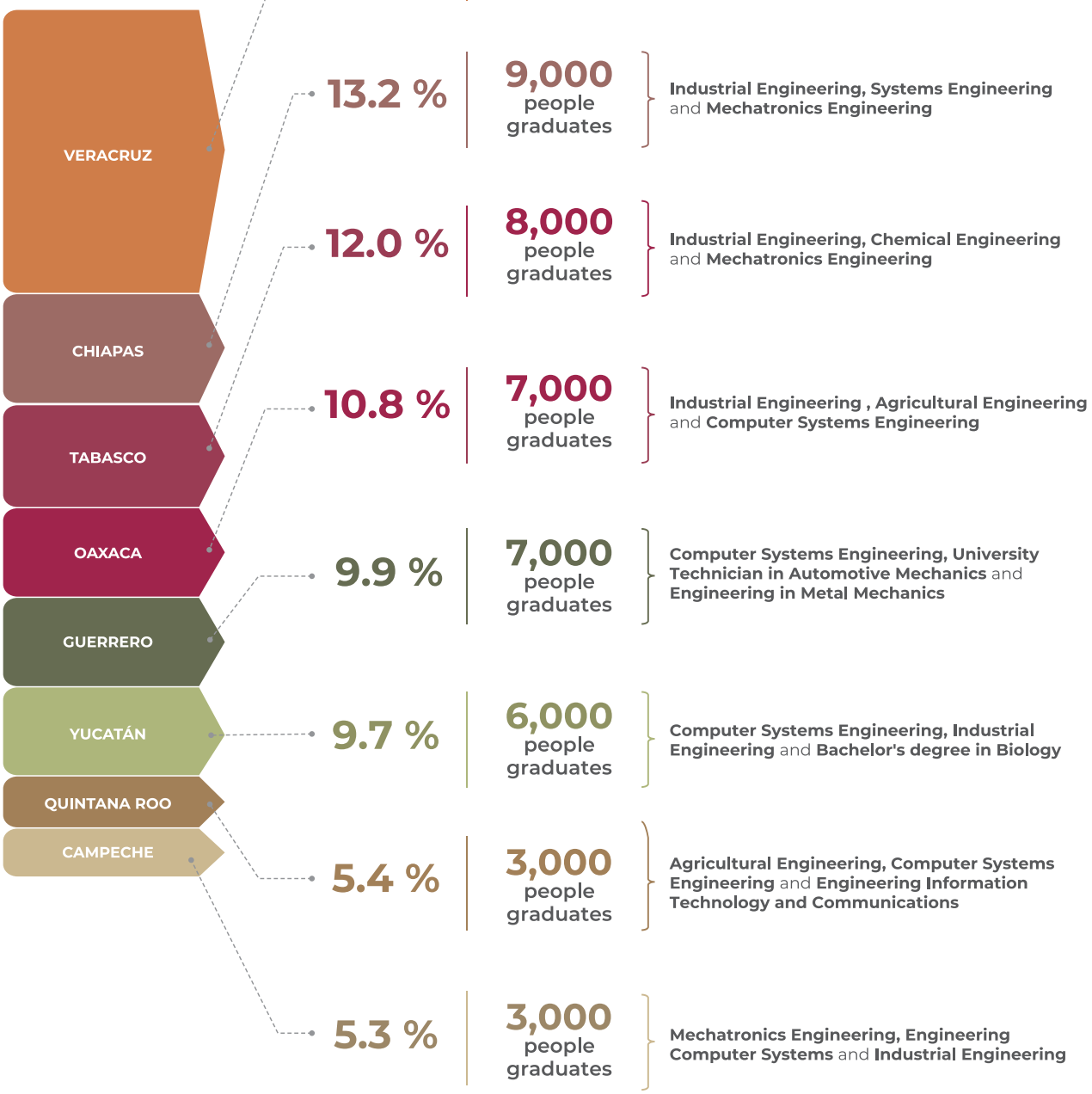
To develop infrastructure, in Oaxaca and Veracruz, a little more than one thousand young people graduate from Architecture and Construction in 2021. This pool reaches more than 2 thousand graduates considering the south-southeast region (Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán).

Distribution of technical talent in Oaxaca and Veracruz according to the North American Industrial Classification System (NAICS)



Source: Elaborated by Secretariat of Economy with estimations provided by Secretariat of Public Education.
Note: Estimation based on the National Survey 911, from 2016-2017 to 2020-2021.

Professional and specialized talent in the South-Southeast zone (2021-2022)



Source: Elaborated by Secretariat of Economy with statistics from the Secretariat of Public Education.

4

Talent in coordination with the industry

DUAL EDUCATION MODEL

Dual education is a **mixed modality at the upper secondary and higher education level**, allowing students to carry out learning activities at school and in the company.

It aims to **develop specialized competencies for the productive sector** and reduce labor market insertion costs. To quickly adapt the educational curricula to the needs of the industry, the companies, together with the Conalep schools, design technical courses for a specific line of production. Those technical courses can last up to 12 months.

Mexican dual education provides several advantages, among which the following stand out:

- Companies reduce hiring costs.
- Students strengthen their productive competencies and social-emotional skills.
- The probability of turnover is reduced.

Just over 3,000

economic units participated in dual education in 2021-2022

26,000 students

have opted for dual education from 2015 to 2023

The most recent example is the collaboration between Intel and Conalep in the Data Science and Artificial Intelligence career to design a technical pathway, which will be implemented in Nuevo León, Jalisco, and Querétaro.

> **Nearly 82 % of companies recognize that dual-education students have better professional preparation than those who attend school.**[13]

Among the participating careers are:

- Electromechanics
- Programming
- Electronics
- Industrial Mechanics
- Alternative Energy Sources

[13]"Monitoring and Evaluation Survey of the Dual Education System in Mexico 2021-2022", Ministry of Public Education (SEP), (2022).

YOUTH BUILDING THE FUTURE

Youth Building the Future Program, under the responsibility of the Secretariat of Labor and Social Welfare (STPS), links young people between 18 and 29 years of age who are neither studying nor working to participating Labor Centers to receive job training for up to 12 months. The objective is to **facilitate the incorporation into the labor market** of the most vulnerable youth population and provide them with opportunities to build a life of well-being.

It is also an opportunity for the participating companies, "Work Centers," to take advantage of the talent and energy of young Mexicans to train them in the skills and work habits required by their industries.

The "Work Centers" design the plans of activities to be carried out by the young people during their training so that the gaps between the demanded labor competencies and the workers' skills are eliminated.

During the training, the Mexican Government directly provides the young people with economic support equivalent to one minimum wage (by 2023, the amount is equivalent to $324 dollars per month) and their insurance with the Mexican Social Security Institute (IMSS).

Since its implementation in 2019, the Program has facilitated the training of around:

2.5 million
young people,
in skills highly valued by the private sector

456 thousand
work center
participants

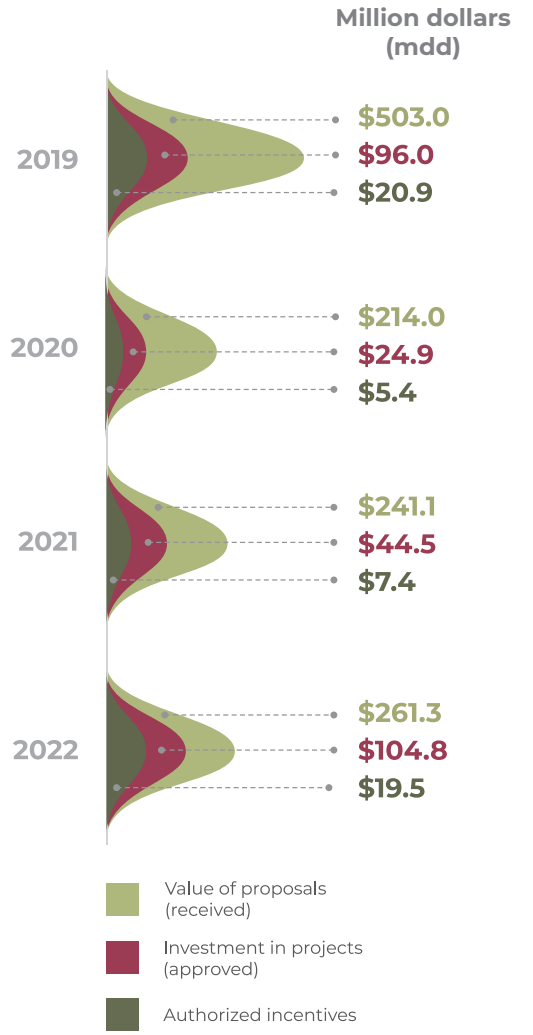
About
2 million[14]
of young workers will enter the labor market over the next five years

[14] "Ally-Shoring and the workforce. The case for greater collaboration between the US and Mexico". The US-Mexico Foundation (2022).

TAX INCENTIVES FOR TECHNOLOGY RESEARCH AND DEVELOPMENT

Mexico has a **Tax Stimulus for Research and Development of Technology (EFIDT)**, which grants a tax credit on expenses and investments in these areas. Through EFIDT, the Mexican Government has promoted a **private sector investment** of more than **$1.18 billion dollars** from 2019 to 2022.

Tax incentive for research and technological development (2019-2022)



IDT incentive applicable to income tax for up to 10 years

$2.57 million dollars
maximum per project

$77.03 million dollars
maximum lump sum

The tax credit is equivalent to 30 % of the incremental expenses and investments concerning the average costs incurred in the three fiscal years before the fiscal year in which the incentive is requested. The taxpayers must request they have at least three years carrying out research and technological development projects.

Participating projects must be aligned with priority issues described in the **National Strategic Programs (Pronaces)** to address and solve the country's priority problems.

Source: Elaborated by Secretariat of Economy with data provided by Conahcyt, 2022.

JOINT VENTURE OF MEDICAL DEVICES

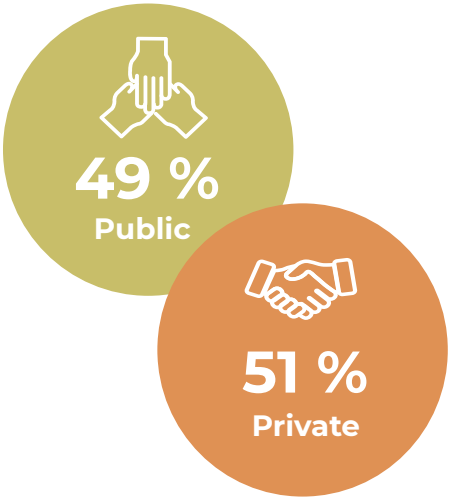
SERIMÉDICA is the first joint venture led by Conahcyt for the **commercialization of high-tech medical devices**. It is being formalized with the direct participation of the Secretariat of Finance and Public Credit and the private sector.

This public-private articulation will have an economic impact on the Nation through:

- Royalties
- Savings on the purchase of devices and consumables
- Maintenance and spare parts policies
- Free upgrades
- Shorter response times for maintenance and repairs, among other things

Through this strategy, Conahcyt contemplates generating spaces for highly specialized talent with competitive remuneration according to their capabilities, articulating productive chains, ensuring environmental sustainability, and contributing to scientific sovereignty and technological independence.

Investment distribution



Potential production capacity in 2023

+24,000

medical devices by year

youth employed in

30 research institutions

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