SPAIN’S PRESENCE
Spanish companies in the world
The information contained in this publication has been reviewed, confirmed and approved by the participating companies. Given that it is impossible to include all the projects Spanish companies undertake in the world, a sample has been selected for the purpose of providing the broadest and most varied overview of the country’s presence abroad. The publication is expected to be updated periodically so that new projects and programmes may be incorporated.
Contents

Introduction ................................................................................................................................. 7

1. Spanish and its economic significance: the power of a language ........................................... 13

2. Spanish companies build the world .......................................................................................... 16
   2.1. Infrastructure for transport and transport management .................................................. 16
   2.2. Civil engineering projects ............................................................................................... 20
   2.3. Engineering: Planning and Projects .................................................................................. 23

3. Focus on the railway: A leading sector delivers a complete range ............................................ 25
   3.1. Design, Projects, Signalling, Construction and Maintenance ........................................ 25
   3.2. High Speed and trains of the future .................................................................................... 25
   3.3. Cities just a subway ride from Spain .................................................................................. 29

4. Energy: Efficiency and quality at the highest level .................................................................... 31
   4.1. Renewables: Wind, Solar, Biomass-Biofuel and Hydroelectric Energy ............................ 31
   4.2. Advanced network management ....................................................................................... 36
   4.3. Electricity and Gas ............................................................................................................ 38
   4.4. Petroleum: Refineries and Turnkey plants ........................................................................ 40
   4.5. Nuclear Power .................................................................................................................. 41

5. Other technologies to protect the environment ......................................................................... 44
   5.1. Comprehensive water cycle .............................................................................................. 44
   5.2. Waste management and treatment .................................................................................... 46
   5.3. Sustainability is the aim ..................................................................................................... 47

6. Air and space systems ............................................................................................................. 50
   6.1. A sector with its own features ........................................................................................... 50
   6.2. Companies and programmes ............................................................................................. 51

7. Naval technology: vessels for the 21st century ......................................................................... 56

8. State-of-the-art cars and components ....................................................................................... 58

9. Other industrial sectors ........................................................................................................... 60
   9.1. Machine-tool ...................................................................................................................... 60
   9.2. Steel .................................................................................................................................. 60
   9.3. Graphene ........................................................................................................................... 62
   9.4. Industrial Chemistry .......................................................................................................... 62
9.5. Artificial casings ................................................................. 62
9.6. Others .............................................................................. 63

10. Information and telecommunications technology ......................................................... 64
10.1. Telecommunications .............................................................. 64
10.2. E-Government and electronic identification technologies ............................................ 65
10.3. Advanced technological solutions ............................................................................. 66

11. Ground-breaking science at the service of health ............................................................ 69
11.1. Health system ..................................................................... 69
11.2. Biotechnology and pharmacy ..................................................................................... 69
11.3. Transplants ......................................................................... 72
11.4. Medical research ..................................................................... 72

12. Finance, insurance and other services: solidity and innovative formulas for enterprise and progress ................................................................. 75
12.1. Finance and insurance ......................................................................................... 75
12.2. Other services .............................................................................. 76

13. We’re in fashion ........................................................................ 77

14. Habitat: The art of living open to the world ................................................................. 79

15. Architecture: Fascinating past, creative present and promising future ......................... 80

16. A publishing industry on a global scale ........................................................................ 85

17. Rather more than cinema and TV; The creative innovation of a country that is really in the picture ................................................................. 87
17.1. Original cinema that connects with every class and culture ..................................... 87
17.2. Spanish TV: The emergence of innovative production. ........................................... 88

18. A unique agrifood sector: Technology, innovation, capacity and quality ..................... 90

19. Tourism and gastronomy: One of the world’s most visited and savoured countries ....... 93

20. Sport ....................................................................................... 96
20.1. International successes ..................................................................................... 96
20.2. Sports management ......................................................................................... 99
20.3. Sports industry ......................................................................................... 99

21. Training business leaders ...................................................................................... 101

22. The multinationals commit to Spain: centres of production and excellence ................. 103
22.1. Infrastructure, Rail and High Speed ..................................................................... 103
22.2. Aerospace sector ......................................................................................... 104
22.3. Biotechnological and pharmaceutical sector ......................................................... 104
22.4. ICT sector ......................................................................................... 105
22.5. Automotive sector ......................................................................................... 105
SPAIN’S PRESENCE
Spanish companies in the world
Introduction

Spanish companies are world leaders in key sectors of high added value, advanced technology and great growth potential. While the country has become a technological power in recent years, its companies are also global forerunners in mature sectors, where they have injected a strong element of innovation, creativity and technology.

Spain has the fourth largest economy in the Eurozone, the fifth in the European Union and the 14th in the world by GDP. It is the world’s 11th biggest investor, with a Foreign Direct Investment stock of 673.989 billion dollars (UNCTAD, WIR, 2015), which represents 2.6% of global investment. It is Latin America’s second largest investor, behind only the United States.

Spain also boasts one of the world’s largest infrastructure networks and, according to the Global Competitiveness Report 2014-2015 (World Economic Forum), it holds sixth place, behind Japan and ahead of the United States, France and Germany. It has the world’s second most extensive high-speed railway network (trailing only China). At around 3,000 km, it is the longest in Europe. Its tracks and control centres deliver state-of-the-art solutions in the field of safety and monitoring technology. Spain also possesses the most modern, technologically advanced train fleet in the continent. In addition, the country has the top European motorway and highway network as well as some of the best subway networks in its principal cities. Spain is also Europe’s third leading country in passenger air traffic and it occupies fourth place in maritime goods transportation, with three of its ports among Europe’s top 10 (Cargo System).

Spain is one of the world’s economies to place the least restrictions on Foreign Direct Investment (FDI). This is reflected by the OECD’s 2012 FDI Restrictiveness Index, which ranks it ninth for openness. Spain is the sixth country in the world in terms of the internationalisation of its economy, according to a report by the consulting firm PwC (measured by the ratio of foreign trade plus direct investments to GDP). The internationalisation process experienced by the Spanish
SPAIN’S PRESENCE

The volume of exports of goods and services as a proportion of GDP is now over 32%, the second highest of the EU’s major economies, behind Germany alone. Spain is the ninth largest exporter of services in the world, the fourth in the EU and the 18th biggest exporter of goods in the world. Since 1999, Spain has been among the leading European powers for export growth, well ahead of Italy, France and the United Kingdom. Among the developed economies, it is the only country whose market share has remained stable in the face of the appearance of the emerging countries. Moreover, the composition of its exports has been profoundly transformed. Exports of medium and high technological content represented 53.2% of the total in 2014.

Spain in one of Europe’s largest markets, with around 47 million consumers, who are supplemented by more than 65 million tourists who visit the country annually. The country’s important geostrategic position, which provides access to high-potential markets, boosts the Spanish economy’s appeal as an investment destination: it is an EU member, a bridge between Africa and Europe, and key to reinforcing relations with Latin America through its economic, cultural and linguistic ties.

All this explains why Spain is ninth in the world for received Foreign Direct Investment (721.879 billion dollars, according to UNCTAD’s World Investment Report, 2015). Over 13,000 foreign companies are established in Spain, resulting in employment for more than 1.2 million people and a turnover of some 430 billion euros a year (España en cifras, 2015, Spanish Statistical Office). Foreign investment also plays a vital part in explaining the Spanish economy’s rapid growth over the past 30 years.

In this period, major Spanish companies have embarked on a concerted internationalisation process. Roughly 65% of the turnover of the IBEX 35 companies is now generated abroad and in some cases it attains higher percentages, close even to 100%. Many of these companies occupy leading positions in terms of market capitalisation in their sectors.

This process has placed Spanish companies among the world’s leaders in sectors of high added value, advanced technology and great growth potential. These include infrastructure and engineering, infrastructure management, electricity, renewable energies, logistics, petroleum refining, high-speed rail, financial, security, automotion, biotechnology, environmental technology and waste-water treatment, aerospace, naval technology, information and communication technologies and e-health and e-administration. As is clear, Spain has become a technological powerhouse over these years. However, Spanish companies are also world leaders in mature sectors, such as fashion, agrifood, restaurants and tourism, into which they have injected a strong element of innovation, creativity and technology. Spain is also a global benchmark in the field of the social economy.
According to OECD figures, large Spanish companies are among the most productive internationally. They have demonstrated a readiness to compete at the highest level, as is reflected by the fact that Spanish firms are now established and providing different services in a wide variety of sectors in every part of the world: motorways, airports, power stations, solar plants, offshore wind farms, hospitals, desalination plants, subway lines, high-speed rail, fashion outlets in the top locations in the major capitals, hotel chains, books etc.

Spain’s industrial fabric is highly diversified: energy, infrastructure, the naval and aerospace sector, biotechnology, ICT, banking, insurance, fashion, habitat, publishing, tourism, agriculture, restaurants etc.

Here are just a few examples:

The company that each year manages the traffic of 140 airlines through four airports in the United Kingdom is Spanish and many subway lines in the world’s great cities (Riyadh, Doha, Lima, New York, London, Mexico, Panama, Miami, Rome etc.) that use the most advanced control and ticketing systems are built and run by Spanish companies. A Spanish firm is the world’s biggest producer of renewable energies, principally wind, and is number one in the UK and Brazil; it is found in the top 10 US electricity companies and distributes electricity to 120 million people in Spain, the US, the UK and Brazil. Over a third of the world’s air traffic is managed using systems developed and implemented by a Spanish company, including 100% of German air space and over 60% of Chinese skies.

The world’s largest fashion distribution group, with over 6,800 outlets in 88 countries across the globe, is Spanish; as are the biggest cooperative group, the largest construction company and the global leaders in olive oil or rice production. These facts provide evidence of the country’s diversification.

Spanish companies head the world ranking for transport infrastructure management, operating 33% of the world’s most important concessions (243 transport infrastructures, according to figures from Public Works Financing, 2014). Moreover, the world’s leading company in infrastructure management and four of the top 10 are all Spanish. In the industrial engineering and construction sector, Spain boasts the largest turnkey refinery contractor. Many of today’s most important civil engineering projects are being carried out by Spanish companies or consortia led by Spanish companies. These include the Mecca-Medina High-Speed Line (the Arab world’s most important infrastructure project) and the expansion of the Panama Canal, the largest international civil engineering work. The total value of the tenders won by Spanish companies in recent years, 52 billion euros in 2014, testifies to this. Spanish infrastructure and engineering companies stand strong abroad due to their know-how and their high level of professionalism, experience and competitiveness. It should also be remembered that they possess the capacity to carry out the full project cycle with regard to infrastructure, energy, water etc.
In the aerospace sector, Spain is a European leader in space programmes and one of the few countries in the world with the capacity to deliver the full cycle with regard to planes: design, manufacture, final assembly and integration, certification, maintenance and modernisation.

Spain is also present in such important sectors as health, in which it boasts the world’s leading company in the production of plasma-derived medicines, which are considered strategic in countries like the United States. Furthermore, one of the world’s top 10 cancer research centres in terms of high-quality science publications and their impact is Spanish. The country is also Europe’s second most important research centre and the world’s fifth in biomedical research (SCImago).

One of the world’s largest and most innovative telecommunications companies in terms of stock capitalisation and number of clients is Spanish. Moreover, two of the world’s top 10 business schools are Spanish.

Similarly, two of the world’s leading financial entities are Spanish. One has been ranked “The Best Bank in the World” (Euromoney) four times in the past decade and the other “The Best Bank in Latin America 2015” (Global Finance). In addition, one of these has created Latin America’s most socially impactful private initiative through financial inclusion and distinguished financial educational programmes. Meanwhile, the other has created a unique programme of support for higher education worldwide through collaboration agreements with 1,290 universities from Europe, the American continent, Asia and Africa, forming the most important universities network in Latin America. Spanish companies also undertake an active CSR policy as they are global benchmarks in creating responsible profit and placing sustainable development at the heart of their business, as demonstrated by their distinguished position in the sector’s most important international rankings. Their response to the United Nations Global Compact (UNGC) is a model for the rest of the world, with the Spanish UNGC network boasting the highest number of participants (2,535 signatory companies and 388 partners).

Creativity, organisational capacity, endeavour, innovation, investment in R&D and dedication are the values that have enabled Spanish companies to occupy the aforementioned positions of leadership.

However, it is not only in the area of business that Spain enjoys an important global position. It is also a caring country, as demonstrated by the fact that it has provided the highest rate of organ donors in the world for each of the past 23 years. This is down to a leading management model, one of social inclusion that is unique in the world. Spain also performs active development cooperation and humanitarian work and its Armed Forces participate in the principal international Peacekeeping and Security operations.

Spain is also one of the safest countries in the world.
It possesses a rich historical and cultural heritage too. Spain has the third most World Heritage sites (UNESCO), some top-notch cultural and creative industries and a language that displays extraordinary international presence and constant growth. Around 500 million people speak Spanish in the world, making it the second most widely-spoken native language, behind only Mandarin Chinese and ahead of English. It is also the second language of international communication.

Spain is also a global power in tourism. It is the world’s second country in tourism revenue (behind only the United States), the top tourist destination for Europeans, and the third most visited country in the world. Suffice to mention two facts: 80% of tourists who visit us return and 40% have made 10 or more visits. Spain is the world’s leading country for its tourism competitiveness, according to the World Economic Forum. It is also recognised globally for its quality of life.

Spain’s evolution in recent years from the economic and business standpoint is a success story, although it is one that is not known widely enough.

This second edition performs a detailed analysis of the positions held by Spain and its companies in the diverse sectors of economic activity. It does not consider every sector nor mention every company that distinguishes itself internationally but it does provide a highly significant sample and substantially increases the number analysed in the first version. Our intention is to keep reflecting the activity of Spanish companies in the world in future editions. We are lucky that Spanish companies continue to find success in the international markets in different productive sectors with a high added value and advanced technology.

The information set out below, which has been verified by recognised international sources and indices, serves to demonstrate this.
Against this background, it is worth mentioning some relevant points, including the following:

1. Spanish is the world’s second most widely-spoken native or mother tongue, behind only Mandarin Chinese and ahead of English, and it is expected to maintain its position in the future. For demographic reasons, the population that speaks Spanish as a native language around the world is growing, while those who speak Chinese or English is falling.

2. In 2015, almost 470 million people have Spanish as their mother tongue (6.7% of the world population). If we add those who speak it as a second language (with a limited command) and those who speak it as a foreign language, the figure rises to 559 million.

3. By 2030, there will be 535 million Spanish speakers (7.5% of the global population) and 550 million by 2050.

4. It is the second language of international communication, after English.

5. It is also the world’s second most studied foreign language. Over 21 million people study Spanish as a foreign language in 106 countries where it is not an official language. The United States has the greatest number of students, with over six million and a 60% growth estimated for the coming years.

6. Spanish is the third most used language on the internet (7.9% of total users), behind only English (27.6%) and Chinese (22.1%). If we consider that Chinese is a language which, in general, is only spoken by its natives and predominantly in a single country, Spanish becomes the second language of internet communication behind English.

7. In the 2000-2013 period, the use of Spanish grew by 1,123% on the internet (compared to the 469% recorded by English). This was particularly due to the incorporation into the Web of Latin American users, where the growth was 1,311%.

8. Spanish is the official language in 21 countries in three continents: Europe (Spain), America (Argentina, Bolivia, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama...
Spanish is one of the six official languages of the United Nations. The others are English, French, Mandarin Chinese, Arabic and Russian.

By 2050, the United States will surpass Mexico as the world’s largest Spanish-speaking country, with 132.8 million Hispanics (30% of its population).

Two-thirds of American university students study Spanish as a foreign language. Spain is also the second most popular country in which American university students complete their studies, after the United Kingdom.

Spanish is a curriculum subject in 90% of American primary and secondary schools.

Having opened a school at Harvard University, the Cervantes Institute has started operations at the Texas A&M University in San Antonio.

Apart from its social and economic significance, Spanish is becoming increasingly important in the United States in political terms. The Hispanic vote is now decisive in the country’s elections and the
number of Hispanic dignatories elected for political office at all levels is rising.

12 > In the next three or four generations, 10% of the global population will be able to communicate in Spanish.

13 > Spanish GDP in the world would be some 4.5 trillion (i.e. million million) dollars. It is estimated that 15% of the Gross Domestic Product (GDP) of a country is linked to its language. The number of speakers, their purchasing power and the international nature of a language are the three key factors which establish the economic power of one language over another.

14 > A common language is a multiplying factor for trade between the countries sharing it. The sharing of Spanish between 21 countries increases bilateral trade by 290%.

15 > The Cervantes Institute is present in 90 cities in 43 countries across the globe as well as on the internet through the Cervantes Virtual Centre. The Royal Spanish Academy and the Association of Spanish Language Academies, comprising 22 institutions in three continents, also perform a key role in the defence, unity and integrity of the Spanish language.

16 > The Cervantes Institute has created the International Spanish Language Evaluation Service (SIELE), in conjunction with the National Autonomous University of Mexico (UNAM), and the University of Salamanca. This is the first online Spanish language certificate aimed at both those who study it as a foreign language and those who have it as a native language.

17 > There are a total of 2,458 Spanish departments in the universities of 116 countries, excluding Spain. The five countries with the most Spanish departments are: United States (1,231), Brazil (96), United Kingdom (84), Germany (76) and Italy (67). The total number of Hispanists is 10,246 in 112 countries, excluding Spain. The five countries with the most Hispanists are the United States (5,260), Germany (467), France (429), Japan (376) and the United Kingdom (321).

18 > The world’s only historical archive to have been declared of World Heritage by UNESCO is a Spanish archive, the General Archive of the Indies. Spain possesses one of the most important documentary heritages in the Western world. The Simancas Archive was the world’s first purpose-built archive, the architect being Juan de Herrera in the time of Philip II (1572).

19 > Spaniards have won eight Nobel Prizes, six in literature and two in medicine.

20 > The Princess of Asturias Award for Literature and the Cervantes Awards enjoy great international prestige and provide a powerful boost to the expansion of the Spanish language and foster global interest in it and Spain. The same role is played by the seven Spanish universities included among the world’s 50 best by 85,000 academics and 41,000 employers who assess the excellence of universities according to the level of teaching of 36 courses for the prestigious Quacquarelli Symonds (QS) World University Rankings.
Spanish companies build the world

Spain is a leading country in the construction sector, with companies that participate in the largest projects across the globe. It boasts a unique combination of experience, in-house technology, technical capacity, management efficiency and environmental protection.

Spanish companies’ great dynamism, advanced technology, R&D&I investment, worldwide activity and undisputed prestige place the country in the very top positions in this field. According to the most recent Global Competitiveness Report of the Davos World Economic Forum for 2014-2015, Spain ranked sixth in the world in transport infrastructures, behind Japan and ahead of the United States, France and Germany. Spanish construction and engineering companies are global leaders that participate in the world’s most important projects: roads, railways, airports, ports etc. Their combination of experience, in-house technology development, high technical capacity, undisputed management capacity and great diversification gives them a presence in 85 countries across the globe. Following on from their major contracts which include in recent years the Mecca-Medina High-Speed Rail line, the Panama Canal expansion, the Riyadh and the Lima subways to mention just a few, they were awarded new and significant contracts in 2015. These included the Toronto Light Rail line, the London Crossrail, the Sydney Light train, the first high-speed train in California, which is the most ambitious infrastructure project in the United States, the biggest refinery in the Middle East etc. However, Spanish construction and engineering companies have also embraced concern for the environment by applying technologies that cause the least impact, conserve biodiversity and make energy savings in energy and CO2 emissions.

02.01. INFRASTRUCTURE FOR TRANSPORT AND TRANSPORT MANAGEMENT

Spanish companies are leaders in air, airport, railway or road infrastructure, in management and control systems for public transport and the application of technological solutions for them:

1 > A Spanish company, the ACS Group, is the global leader in transport infrastructure management in terms of the number of road, railway, airport or port concessions either under construction or in operation at October 2014, according to the ranking by the sector’s benchmark journal, Public Works Financing. The ACS Group is also first in Engineering News Record publication’s list of international constructors.

2 > There are four Spanish transport infrastructure management companies in the world’s top 10 for road, railway, airport or port concessions either under construction or in operation (October 2014). Together with the leader ACS, GLOBALVIA-FCC is third, ABERTIS fourth and FERROVIAL seventh in...
the list created by Public Works Financing. Other Spanish companies are also placed highly. These include ACCIONA, ISOLUX CORSÁN, ITINERE and OHL. Nine of the 39 companies in the ranking are Spanish.

3 > 33% of the world’s largest transport concessions, mainly airports, ports and motorways, are managed by Spanish companies (243 infrastructures), according to Public Works Financing’s latest ranking.

4 > AENA is the world’s leading airport organisation in terms of passenger numbers, with over 196 million in 2014 in the 46 airports and 2 heliports that it manages directly. It is followed by the Airports Authority of India (almost 169 million in 2014). AENA also participates in the management of another 15 of the world’s airports that transported 44 million passengers in 2014. Since 2015, it has participated in the management of a Jamaican airport through the Pacific Airport Group (PAG). In terms of air traffic volume, Spain is the third largest in Europe, behind the United Kingdom and Germany, according to the Airports Council International (ACI). Its flotation on the stock market in February 2014 was the largest of any company in Europe since 2011 and in Spain since 2007.

5 > The largest transport infrastructure management company in terms of sum invested (75.2 billion dollars) is Spain’s ACS, according to Public Works Financing’s 2014 ranking.

6 > The second largest transport infrastructure management company in terms of sum invested (74.3 billion dollars) is Spain’s FERROVIAL, according to Public Works Financing’s 2014 ranking. It runs two of the world’s best assets: Toronto’s 407 ETR motorway and London’s Heathrow Airport, which welcomes 72 million passengers a year.

7 > Europe’s largest infrastructure project, “Crossrail”, is also being built by FERROVIAL in London. The Spanish company is responsible for the construction of two tunnels, access shafts and caverns and the new Farringdon underground station, one of the busiest in the British capital.

8 > With four motorways under concession and construction, ISOLUX CORSAN has become the leading European promoter of major infrastructure in India.

9 > Spanish companies enjoy the leadership in land transport management: motorway concessions, toll motorway management, ticketing, security, operation and control, and parking systems.

› The world’s leading operator in the motorway concessions sector is a Spanish company, ABERTIS, which runs over 7,500 kilometres of the...
world’s motorways. It is the leading operator of high-capacity roads in different countries and is a clear leader in Latin America:

- In Brazil, ABERTIS runs over 3,246 km of highways through its investee Arteris, which makes it the largest operator in the country with a 17% share in the motorway market.

- In Chile, it is the leading motorway operator in terms of traffic volume. It manages 771km.

- It is also present in Argentina, where it manages two of the most important approach roads into Buenos Aires, in Puerto Rico, where it operates the island’s busiest motorway among others, and in Colombia.

- It is also third in terms of the kilometres it runs in Europe. It has a strong presence in France, where it manages 22% of all motorways.

Another Spanish company, CINTRA, the motorway subsidiary of FERROVIAL, is the global leader in the private promotion of transport infrastructure, both in terms of the number of projects and the level of investment. It manages 28 concessions totalling over 2,232 km.

FERROVIAL manages the North Tarrant Express and LBJ Express in Texas. These two highways run along the Dallas-Forth Worth freeway, one of the most congested corridors in the United States. They are among the world’s most advanced due to their route design and their technology, using a Managed Lanes system that adapts constantly to the level of traffic recorded. The company is also developing and administering a new highway, the I-77c in North Carolina.

The world’s first toll motorway to incorporate the first electronic toll and free flow system, the 407 ETR in Toronto, is run by Spanish company FERROVIAL. It has 39 interchanges and over 190 lateral entry or exit accesses, each with an electronic vehicle detection device.

OHL is responsible for the construction and operation of the Elevated Bicentenary Viaduct in Mexico. Its electronic toll system, the most advanced in the whole of Latin America, was developed by another Spanish company, INDRA. This infrastructure manages over 1,400 vehicles per lane per hour, a much higher ratio than with traditional systems. It received the State Civil Engineering Prize for the Best Construction in the State of Mexico.

- OHL is responsible for the construction and operation of the Elevated Bicentenary Viaduct in Mexico. Its electronic toll system, the most advanced in the whole of Latin America, was developed by another Spanish company, INDRA. This infrastructure manages over 1,400 vehicles per lane per hour, a much higher ratio than with traditional systems. It received the State Civil Engineering Prize for the Best Construction in the State of Mexico.

A Spanish company, ITS (100% owned by Abertis), is one of the world’s leaders in toll technology. It is responsible for installing and maintaining the toll system of Newport Pell Bridge in the state of Rhode Island, United States, which employs a mixed system of traditional and free-flow tolls for the management of over 35,000 vehicles a day. The new system improves passage fluidity through the toll, which has reduced rush-hour congestion.

ITS is also the company responsible, in conjunction with the Alliance for Toll Interoperability (ATI), for the pilot project for the development and operation of a platform, the Interoperability Hub. This enables affiliated concessionaires to share information about users so that they can travel through various states with the same electronic toll system and a single receipt. “Fast Toll Interop”, the product’s name, has proved itself to be the best solution for providing interoperability at national level in the United States market. The company also runs toll systems in the United Kingdom, Canada, Ireland and Puerto Rico.

Control of access to the Eurotunnel’s new loading terminal will also be managed by ITS. This uses new technology that combines electronic tolls and video in order to monitor vehicles. It will also increase the infrastructure’s capacity and safety and reduce costs.

Leadership in traffic management.

Over 4,000 air traffic management facilities in over 160 countries use the technology of Spanish company INDRA. This makes Spain a global leader in the supply of this type of system.
INDRA’s Spanish technology also manages 100% of German air space and 60% of China’s skies. The company is present across the globe, undertaking projects in countries like Germany, Australia, China, India, Morocco, Oman, Poland, the United Kingdom, Ukraine and throughout Latin America. It is also a global leader in technological developments for transport infrastructure and implements solutions for airports.

Spanish company FERROVIAL annually manages the traffic of 140 airlines that carry almost 87 million passengers through four airports in the United Kingdom: Heathrow, Glasgow, Aberdeen and Southampton.

Another Spanish company, AENA, manages another airport in London. This is Luton, the UK’s fifth airport in terms of number of passengers, with 10.5 million in 2014. It also holds stakes in other companies that operate airport assets together with stakes in 12 Mexican airports through the Pacific Airport Group (PAG), with a traffic of 24.7 million passengers in 2014. It also holds stakes in the Colombian airports of Cartagena de Indias and Cali, which had combined traffic of 8.3 million passengers in 2014. In 2015, through the PAG, it took a stake in Jamaica’s Montego Bay airport, which received 3.6 million passengers in 2014.

Spanish company INDRA is one of the leaders of the SESAR (Single European Sky ATM Research) European project that aims to create the Single European Sky. It has paved the way with the entry into service of 4D Trajectory Management systems, in conjunction with the air navigation suppliers NATS (United Kingdom), ENAIRE (Spain), DFS (Germany) and LVNL (Netherlands). New European partners will join soon. This will mean that Spanish technology manages over 1/3 of flights in Europe.

Latin America’s main port of entry into Europe is Adolfo Suarez Madrid-Barajas Airport, a hub for the flights of the One World partnership to which Iberia belongs. The airport has received numerous awards from European and international institutions that endorse its record:

- It has been recognised as the Best Airport in the South of Europe in the World Airport Awards 2015 of Skytrax, the sector’s most prestigious consultancy.
- In 2014, it was selected as International Airport of the Year in the CAPA Awards in the over-25 million passenger category. It has also received numerous other prizes, awards and accolades over its history.
Another important point of communication with Spain is Barcelona-El Prat Airport. In 2014, it had 207 destinations and 107 different airlines serving 56 countries. It is the leading airport for low-cost companies in Europe, being AENA’s leading airport in traffic volume for Ryanair, Vueling and EasyJet. Barcelona-El Prat has received international acknowledgement in the form of awards that include:

- Best Airport with over 25 million passengers in 2010 and 2014, according to ACI Europe.

The leading western construction company, which focuses on the creation of infrastructure at global level, is Spanish company ACS.

The world’s leading company for hospital construction is a Spanish company, OHL. It is building one of the most technologically advanced hospitals in the world, the Hospital Centre of the University of Montreal, which has obtained the Gold Category prize for project funding from the Canadian Council for Public-Private Partnership.

Other Spanish companies occupy leading positions in the construction and operation of hospitals, such as ASSIGNIA, FCC and SACYR.

The third largest contractor in Latin America and the Caribbean is a Spanish company, ABENSA-ABENGOA, according to the Engineering News Record ranking.

Many of the principal projects are either built by Spanish companies or by consortia led by them or in which they have a substantial stake:

The expansion of the Panama Canal, the largest international civil engineering project, is being carried out by a consortium led by a Spanish company, SACYR. The Canal has two lanes of locks and the expansion adds a third lane through the construction of two sets of locks, one on each side.
of the canal. These new floodgates will enable the passage of larger vessels, known as “post-Panamax” ships.

- In this project, another Spanish company, INDRA, has become an important technological partner. It is responsible for implementing an integrated access control and security system, a vessel detection system, all communications technology, fire detection and suppression systems, public address, evacuation and an environmental sensor system for the Panama Canal’s third set of locks.

- Another Spanish company, MAXAM, has performed the blasting using technology that is unique in the sector.

- For its part, FCC participates in the consortium responsible for developing the Pacific Access Channel (PAC4) project that digs a new channel in the Panama Canal.

- Spanish company FERROVIAL built Heathrow Airport’s T2A terminal, the first of a new greener generation in Europe which produces 40% less CO2 emissions than the previous construction. It has received the biodiversity award from the Wildlife Trust organisation.

- With over 100 state-of-the-art projects, many of them developed in collaboration with the world’s most renowned centres like the Massachusetts Institute of Technology (MIT), FERROVIAL shows its commitment to innovation and respect for the environment.

- One of Canada’s biggest motorways, the A-30, which is vital for Quebec’s communications, was built by two Spanish companies, ACCIONA y ACS.

- Spanish company FCC has participated in the construction of the St. Gotthard rail tunnel (Switzerland), the world’s longest at 55 km, through its subsidiary, Alpine.

- One of the world’s 10 largest concrete cable-stayed bridges, the Wroclaw Bridge in Poland, was built by a Spanish company, ACCIONA.

- ACCIONA has also built the world’s second longest incrementally launched bridge, the Beauharnois, which is 2,550 m in length, on the A30 Express motorway in Montreal, Canada.

- And also one of the world’s longest cable-stayed bridges, Ting Kau in Hong Kong.

- One of the largest infrastructure projects in Europe, the cable-stayed bridge over the Firth of Forth in Scotland, was designed and built by a consortium led by the ACS Group (DRAGADOS).

- A Spanish company, OHL, is building Miami’s largest interchange, which is the largest public work of the Florida Department of Transportation.

- The world’s largest earth pressure tunnel boring machine, the 17.5 metre diameter Bertha, was designed by a Spanish company, ACS. It enables the 2,700 metre-long SR-99 tunnel to be constructed in Seattle and remove the Alaskan Way Viaduct. ACS will also be the world’s first company to use tunnel boring machines in the construction of the New York suburban transport network, which is being enlarged at present.

- Bulgaria’s biggest construction project, the Vidin-Calafat Bridge that will link the country to Romania and will accommodate road and rail traffic, was built by Spanish company FCC.

- The world’s largest floating dock, the Monaco Dock, for extending the port of La Condamine, was built by two Spanish companies, DRAGADOS (ACS) and FCC.

- Spanish company FCC has built the Nuevo Nezaca-Ávila Camacho motorway in México. This includes the construction of the San Marcos Viaduct, which at 225m has the world’s second highest pier.

- The construction and operation of one of Italy’s most important motorways, the Pedemontana-Veneta, is the responsibility of a Spanish company, SACYR.

- The Spanish company, ASSIGNIA, will build Chile’s Salvador Hospital, a benchmark public health centre geared to the care of highly complex diseases.

- The company is also building and will then operate Ixtapaluca Hospital (Mexico). It has
implemented a care model that integrates into the service network to promote development and improve the population's quality of life.

- Spanish company SACYR will build the Antofagasta Hospital, Chile’s largest, which will benefit a population of 260,000 and make more beds available in the region. It will boast infrastructure and medical equipment of a high level and complexity.

- FCC has won the contract for the design, construction, funding, maintenance and operation of the bridge over the River Mersey in Liverpool (United Kingdom). With a length of 2.13 km, it will serve some 80,000 vehicles a day. It is expected to open to traffic in late 2017. The contract’s most singular element is the cable-stayed bridge of 1 km in length, 42 metres breadth and a maximum height of 125 metres. The project also includes the redevelopment of 7 km of access roads, 2.5 km of new motorway and the renovation of another 4.5 km of motorway, as well as different communication links.

- In addition, Spanish companies continue to be awarded many of the largest international projects currently out to tender:
- ACS has won the contract for the design, construction, maintenance and operation of the US 181 Harbor Bridge Replacement project in Corpus Christi (Texas). This includes the construction of the United States’ longest cable-stayed bridge. The structure will also have a clearance height of 62 metres to allow the largest transoceanic ships, including those that pass through the expanded Panama Canal, to gain access to the port of Corpus Christi.

- ACS will also build, operate and maintain the new Champlain Bridge over the St. Lawrence River in Montreal, one of Canada’s largest infrastructure works. It will replace the existing Champlain Bridge. Built in 1962, it bears one of the country’s highest levels of traffic, with 40 million vehicles annually. As well as representing one of the principal means of access to the Island of Montreal from the eastern side, the bridge performs a strategic function due to its position as one of the principal trade routes with the United States.

- SACYR will build a cable-stayed bridge over the Magdalena River in Barranquilla. It will be Colombia’s longest bridge and the country’s largest public works project. It will enable the passage of larger vessels and improve traffic circulation, also increasing safety.

- FERROVIAL will build and run 152 km of the Bu-caramanga-Barrancabermeja-Yondo motorway in Colombia.

- ACCIONA is participating in Norway’s largest transport infrastructure project. It will build one of the sections of the high-speed rail line that will link Oslo with the town of Ski. This includes two twin 20km tunnels of the Follo Line project, the longest in the Nordic countries. Four tunnel-boring machines will be used simultaneously during construction.

- FERROVIAL and ACCIONA will design and build a 19.5 km section of the Pacific Highway in New South Wales. The highway is one of Australia’s busiest and links Sydney, the country’s largest city, with Brisbane, its third. The expansion and improvement work forms part of the Australian and New South Wales’ governments’ plan to transform it into a four-lane roadway.

- The consortium formed by Ferrovial Agroman and Laing O’Rourke will build the central section of the Thames Tideway Tunnel, a new infrastructure for London’s sewerage system. At 12.7 km, it is the longest of the three sections into which the tunnel is divided.

- ACCIONA has recently opened the two Legacy Way tunnels, 4,260 m long and 12.4 m in diameter, in Brisbane, Australia. The company beat daily, weekly and monthly records for tunnelling during construction.

- A consortium led by ACS will build two sections of Sydney’s WestConnex urban motorway, totalling 33 km. Regarded as the largest urban transport project under development in the country, it increases the company’s notable presence in the Australian market.

KEY FACT / The world’s largest floating dock, the Monaco Dock, has been built by two Spanish companies
Spanish civil engineering companies occupy leading global positions. They enjoy international prestige, as borne out by their major pioneering work in the world and their high level of know-how. Spanish companies export technology that is often their own and participate in the design, supervision and monitoring of leading projects:

1. The preliminary executive plan for the Toluca-Mexico City passenger train and the creation of the corresponding construction plan is being undertaken by a Spanish company, SENER. It is also carrying out the project management for the Guadalajara light train in Mexico.

2. A Spanish company, TYPSA, is performing the engineering for the use of what will be one of Latin America’s largest hydroelectric plants, Belo Monte in the Xingu River in Brazil, with 12,222 MW installed capacity and 11,000 MW generated. It also undertakes other important projects in the region including:

   - The supervision of Uruguay’s first terminal for the storage and regasification of Liquefied Natural Gas (LNG) in Punta Saygo.

3. The engineering works for the construction of Europe’s largest desalination plant and the third in the world, the Valdelentisco Desalination Plant, are being carried out by Spanish company INYPSA. It is one of the three most important cartographic engineering companies operating in Central America.

4. Supervision and monitoring of what will be India’s longest tunnel, Patnitop in the Kashmir region, is being undertaken by the Spanish company, EUROESTUDIOS.

5. A Spanish engineering company, TYPSA, leads the consortium to develop the largest EU-funded project in Turkey. This consists of technical assistance for the redevelopment and signalling of the İrmak-Karabük-Zonguldak railway line. It is also undertaking:

   - The design of Latin America’s largest waste-water treatment plant and one of the world’s largest, Atotonilco in Mexico.

   - The engineering studies for the development of a Large Scale Port (LSP) at the San Antonio port, Chile’s largest.
6 > The expansion and enhancement work on the Cairo-Alexandria motorway, Africa’s most emblematic corridor, are supervised by the Spanish company, ACCIONA. It has also helped to design and provide technical assistance for the second composite bridge over the Danube (Vidin-Cala-fat), an infrastructure that is key to the European structuring process.

7 > A Spanish company, SENER, is designing two road tunnels under the Suez Canal in Egypt and is responsible for the civil engineering works, electromechanical facilities and the associated intelligent transport communications.

8 > For the world’s first desalination plant to operate with solar energy, a milestone in the search for sustainable solutions in water management, TYPSA is revising the construction project and supervising work both on the Al Khafji desalination plant in Saudi Arabia and on the photovoltaic facility that will provide its power supply. The company performs many other projects involving revision and supervision related to water management in Saudi Arabia. These include the supply of water to the city of Riyadh and storage works for the supply of water to Jeddah etc.

9 > The London Underground has used a Tunnel Assessment Device (TAD) to inspect a section of tunnels in the world’s oldest and second longest subway system. This technology was developed by a Spanish company, ECG. TAD uses a mobile vehicle on which six laser cameras are fitted in order to make a 3-D map of the tunnel. This enables any deterioration or anomaly to be detected very quickly. The technology was used by ECG in the auscultation of 420 km of tunnels in the Genoa and Calabria railways (Italy).

The company’s technology, which is based on analysis and monitoring of the quality of materials, has been used for the construction of the Mersey Gateway Bridge in Liverpool and for the improvement of the M8 motorway, Scotland’s busiest road. In addition to the United Kingdom, its Curvimeter technology is used in other countries like Germany, France and Mexico. The key is that it provides knowledge about when and how to invest in order to optimise investments.

10 > Spanish engineering companies, internationally recognised for their know-how and technology, perform many other important engineering projects worldwide. These include the design of the expansion of Sao Paulo (Brazil) international airport, the drinking water provision plan in Riyadh (Saudi Arabia), the studies for Abu Dhabi’s new subway network, the development of the plan for the improvement, construction, supervision and maintenance of Abu Dhabi’s infrastructure network and the study of a rail corridor to link the city of Denver (Colorado, USA) with the tourism and ski centres of the Rocky Mountains.

**KEY FACT**

A Spanish company is building Europe’s largest desalination plant and the third in the world.
Spain is a global benchmark in the design, construction, maintenance, signalling and management of new lines, in improving new ones, in rail technology and in the development of rolling stock. It has the world’s second most extensive high-speed network and Europe’s longest and one of the most advanced train fleets. Spanish companies form one of the world’s most powerful railway clusters.

03.01. DESIGN, PROJECTS, SIGNALLING, CONSTRUCTION AND MAINTENANCE

The major investments in the past 25 years to improve the Spanish rail system have made the country an undisputed global benchmark in the design, construction, maintenance, signalling and management of new high-speed lines, in the improvement of the features of existing ones, in rail technology and in the development of rolling stock.

Spain is a global technological power in this sector. Its dynamism has enabled Spanish companies to be present across the globe and to build the second most extensive high-speed network in the world and the longest in Europe, with over 3,000 km in service. Spain also possesses one of the world’s most modern and technologically advanced train fleets. Many countries have come to Spain to learn about the rail system and its high-speed model, with around 100 relevant visits in 2014. Moreover, the establishing of consortia of Spanish companies to develop High Speed has brought the country many successes.

Spanish companies design and build, they implement projects and manage them, and they maintain them in a secure, integrated manner, which makes them highly competitive. Spain is an undisputed leader in rail design and projects, both high-speed ones and in conventional lines, in the development of cutting-edge technologies, in the deployment of information and signalling systems, in the construction and maintenance of infrastructures and in safer, more efficient traffic management. Spanish companies are present throughout the rail value chain, from the planning phase to entry into service and operation. As a result, they have formed one of the world’s most powerful railway clusters, creating value and wealth in one of the technically most advanced sectors.

03.02. HIGH SPEED AND TRAINS OF THE FUTURE

The High-Speed rail network is one of the great achievements of the Spanish rail sector and enjoys worldwide recognition and prestige. A benchmark in the construction and management of
rail infrastructure, Spanish companies participate in the most outstanding projects in over 90 countries across the globe.

The most important infrastructure project in the Arab world in recent decades for its significance, visibility and cost is being carried out by the Hispano-Saudi consortium, the Al Shoula Group, which comprises 12 Spanish companies (RENFE, ADIF, INECO, TALGO, OHL, COPASA, COBRA, CONSULT-TRANS, IMATHIA, INABENSA (ABENGOA), SIEMENS and INDRA). The consortium was awarded the Mecca-Medina High-Speed project for a sum of around 7 billion euros. This project involves the construction, operation and maintenance of both line and trains over a 12-year period. The line will be 450 km long and will serve over 160,000 pilgrims a day.

The high-speed line between Ankara and Istanbul (the Eskisehir-Esenkent section) was built by a consortium led by a Spanish company, OHL. The project involved the building of 206 km of double track. Another Spanish company, CAF, was responsible for manufacturing the first high-speed trains to operate on the line.

The Marmaray CR3 project was also developed by a consortium led by OHL. It redevelops Istanbul’s local rail system and connects the city’s European and Asian sides to allow the transit of local trains. In the future, it will enable high-speed and goods trains to run between the two continents. It is the first underground link between two continents.

The leadership of the sector’s Spanish companies is clearly evident as they continue to be awarded many of the top international projects of the day:

ACS has been awarded the first high-speed project in California, the United States’ most ambitious infrastructure project. SENER is undertaking the conceptual engineering work for the project.

ACCIONA is participating in Norway’s largest transport infrastructure project. It will build one of the sections of the high-speed rail line to link Oslo with the town of Ski. This will include two 20km tunnels, the longest in the Nordic countries. It is estimated that the line will halve travelling time between the two locations.

OHL will rebuild and enlarge a station for the high-speed line in Norway as part of this project.

CAF will supply the high-speed trains for the line connecting Oslo to its airport. The contract involves the supply of trains belonging to OARIS, CAF’s high-speed platform.

In recent years, CAF has shown strong commitment to developing its own High-Speed technology. It has invested considerably in research that has enabled it to develop a model capable of reaching 350 km/h. This is OARIS, which is equipped with the most advanced technology in the areas of dynamics, aerodynamics and noise and delivers enhanced comfort and functionality.

The consortium headed by CAF and comprising the ISOLUX-CORSÁN, AZVI and Thales companies will develop the inter-city train project to link Mexico City with Toluca as part of the Mexican Government’s National Infrastructure Plan. The CAF supply includes rolling stock that will incorporate the most advanced technology. Designed for the transportation of the public with the highest standards of quality and safety, trains will have a diaphanous interior, with an intercommunication passage between railcars, and spaces for people with reduced mobility.

This is a comprehensive project that includes other companies from the CAF Group: CAF Signalling will supply the ATO system, the control centre and the ERTMS onboard equipment within the signalling package; the CMFS construction company is in charge of electro-mechanical facilities, while CAF Transport and Engineering is responsible for integration engineering and project coordination.

The consortium comprising TÉCNICAS REUNIDAS and INECO is conducting the study for the development of the Oman rail system, which will form part of the network to be constructed in the Gulf countries.

What lies behind the awarding of these major contracts? A competitive business fabric, one that is professional and comprehensive, with companies capable of providing all the services neces-
necessary and boasting great experience. Here are just a few facts:

- The use of ERTMS (European Rail Traffic Management System) on RENFE trains.

Spain is the European country with the highest number of kilometres installed for the use of ERTMS: RENFE’s 1,738 railway vehicles, 1,253 locomotives and 485 self-propelled units have onboard equipment necessary to run along lines equipped with this signalling and rail safety system. In 2014, RENFE covered 55,650,000 km with it, 28.04% of the total km run by the trains operated by RENFE. In 2015, RENFE trains equipped with ERTMS travelled 152,570 km a day. It is customary for RENFE to transmit the knowledge it has acquired in using ERTMS to the other railway administrations in its environment.

This is a European development in which the Spanish company ADIF is a leader, with over 2,100 km in use, not just High Speed but also local lines, the result of the most advanced R&D&I in the rail sector. This system facilitates interoperability with other EU countries and enables safer and more frequent journeys. Consequently, many non-EU countries are interested in implementing it. In fact, it was first implemented outside Europe on the Buenavista-Cuautitlan Suburban Railway, led by CAF and with the technical assistance of ADIF and INECO. Spain provides advice to a variety of countries like Saudi Arabia, Denmark, Israel, Turkey, India, Egypt etc.

- The Copernicus system of rail operations management.

The Copernicus system was developed by RENFE and INECO and is the intellectual property of RENFE. It is the platform Spain’s benchmark operator uses for the operations management of all its trains. Among other aspects required for good rail management, the system provides real-time knowledge of the situation of each train, the speed at which it is travelling and whether it is running late, information on the maintenance of each unit, the number of passengers it is transporting at any time, the stations at which they get on or off and the crew members. Copernicus is a system that is fully exportable to any railway administration and it may be adapted to the needs of each of those administrations.

- Technical advice. One of the aspects that takes priority in RENFE’s internationalisation is the technical advice and training courses that it provides to other railway administrations. Technical advice concentrates on any aspect of railway operation, both for long-distance passenger traffic, including High Speed, medium distance, local and goods. Countries like Russia or Bosnia and Herzegovina have taken part in these programmes. The Training School is at the cutting edge of the training of its professionals, especially in the TALGO high-speed locomotive.
area of driving. In addition to the training provided to its own drivers, many current drivers of Turkish High-Speed trains have been trained at these facilities as well as the future train drivers of the Medina-Mecca line.

Sale and hire of material. RENFE also excels in selling material that it renovates at its own facilities so it may be adapted to the needs of the purchasing company. Its most recent task was the manufacture of two metric gauge tourist trains for Ecuadorian railways. RENFE possesses the Civia platform for local trains, a concept involving material that is adaptable to every need, as these trains may provide 200 seats to over a thousand. To facilitate this work, it has created a specialised division for the sale and hire of material.

The Da Vinci system, developed by INDRA and the intellectual property of ADIF, is the world’s benchmark platform in rail traffic management. It manages both the entire Spanish High-Speed network and networks with differing characteristics and it will be incorporated into the High-Speed line to connect Mecca and Medina. It is already being operated successfully in countries like Lithuania, Colombia and Morocco.

The ADIF network is among the four networks with the highest quality in the world, according to the World Economic Forum.

CAF (CONSTRUCCIONES Y AUXILIAR DE FE-RROCARRILES S.A.) is an international frontrunner in the design and implementation of comprehensive rail transport systems. It is a leader in delivering global, complete solutions of high added value, which are developed from its own state-of-the-art technologies. These are adapted to the needs of each customer, thereby minimising costs during the life cycle. CAF is also one of the most important suppliers of rail material in the entire American continent.

TALGO is among the world’s leading manufacturers of operating High-Speed rolling stock due to its technological innovation capacity. The company stands out for its unique, differentiating High-Speed, Intercity and Long-Distance technology. It is responsible for the design and manufacturer of the High-Speed trains for the Mecca-Medina project, the world’s first turnkey contract for high speed rail and the most complex due to operating conditions involving high temperatures and sand. It also supplies long-distance trains and maintenance for the railways of the Russian Federation, Uzbekistan and Kazakhstan. Since June 2015, TALGO trains have run with notable success between Moscow and Kazan, substantially improving on previous services that used Sapsan high-speed trains with German technology. It has an industrial presence in the United States, Germany, Russia, Kazakhstan and Uzbekistan.
Only the leading companies of the Spanish rail sector boast technology for automatic track gauge switches that is unique in the world. This fits trains with a rolling system so that they can shift from a track with one specific gauge to another with a different gauge. Spanish companies TALGO and CAF possess rolling stock equipped with two automatic variable gauge technologies: TALGO RD (which stands for Rolling System in Spanish) technology, used in TALGO vehicles, and BRAVA (Self-Propelled Variable Gauge Rolling Bogie) technology, employed by CAF in diesel and electric self-propelled passenger trains. The switches may be equipped with a single platform, either TALGO or CAF, or with a dual platform system, that allows gauge switching for both technologies. This so-called “dual switch” was successfully tested in 2001 and enables the two systems to be made compatible. For its part, ADIF holds patent rights for a variable gauge system called Unichanger, for which it is developing the first prototype within a consortium comprising TALGO, TRIA, ADIF, CAF, FUNDA-CIÒN DE LOS FERROCARRILES and CEIT. The aforementioned technology enables passenger and goods trains to run between countries with different track gauges (e.g. Spain and France, Poland and the countries of the former Soviet Union etc.) and between sections with different track gauges in the same country, according to whether they are specified for High-Speed or standard-speed trains.

INABENSA (ABENGOA) is an international benchmark in overhead power cables, substations, communications and auxiliary systems (lighting and ventilation) as well as the design, supply, assembly and maintenance of electrification facilities in rail projects.

SENER is one of the world’s leading engineering companies in the implementation of High-Speed lines. As an expert, it was responsible for the creation of two High Speed manuals for the International Railways Union (UIC).

ARCELORMITTAL plays a key role in the success of the Spanish High-Speed industry. Spanish steel rails are a cornerstone of this success and they enable trains to travel at 350 km an hour with the utmost safety. These rails are manufactured at its factory in Gijón (Asturias). The company’s advanced technology has enabled it to participate in the world’s most demanding projects in France, Portugal, Germany, Turkey, Saudi Arabia and Morocco.

Spanish companies have also become world leaders with regard to regional and local trains, with CAF again holding a distinguished position.

The experience of Spanish infrastructure companies has enabled them to carry out subway, light rail and tram projects in a multitude of cities worldwide: the subways of Brussels, Bucharest, Mexico City, Rome, Sao Paulo and Washington DC (CAF), the Miami Subway (OHL), the Panama Subway (ACCIONA, FCC, ISOLUX), the New York Subway (ACS), Crossrail and the extension of the Northern Line of the London Underground (Ferroviario), the Santiago subway in Chile, the Lisbon subway and the Porto subway (SACYR).

The most recent projects, very large ones that are among the most important in international terms, demonstrate that the leadership of the major Spanish companies is continuing and the run of success is being consolidated. However, there are other participants. These are engineering companies and other smaller firms from the infrastructure sector that have developed leading technologies in many of these fields:

ACS has been awarded the contract for the Toronto light rail system, one of Canada’s biggest infrastructure projects. This consolidates the company’s presence in the country in which it has been awarded other very important projects. These include the new Champlain Bridge over the St. Lawrence River in Montreal, one of the largest infrastructure works in Canada.

ACCIONA is to build the Sydney light rail system, one of Australia’s most important projects. This consolidates its presence in the country after it was also recently awarded important projects. These include a section of the Pacific Highway, one of the busiest in Australia which links the country’s biggest city Sydney, with its third, Brisbane.
Line 2 of the Lima subway and a branch line of Line 4, one of Peru’s most important infrastructures of recent years, is designed and built by a consortium led by ACS and FCC.

The Riyadh subway lines, which will be the world’s longest under construction, are being built by a consortium led by FCC. TYPSA and SENER are also participating in the project.

The Doha subway is being built by a consortium led by OHL and FCC respectively.

Line 2 of the Panama subway is being constructed by a consortium headed by FCC, which has already constructed Line 1. AYESA, METRO DE BARCELONA and SENER are also participating.

The extension of the Northern Line of the London Underground, which involved the digging of a new tunnel and the creation of two stations, is being carried out by a consortium in which FERROVIAL is a participant.

TYPSA is undertaking the project for a new subway line in Stockholm with a rock tunnel under the Satsjön Sea.

CAF will supply automatic subway units that will remove the need for a driver’s cabin in the subways of Helsinki, Istanbul and Santiago (Chile).

What lies behind the Spain’s great successes in this sector? Highly competitive companies, with advanced technology and great management capacity and experience:

INDRA is one of the world’s leading companies in solutions for access control and transport ticket vending throughout the world.

CAF delivers subway solutions in cities worldwide and its outstanding technological developments enable it to participate in the most complicated urban transport lines of subways and light rail systems abroad. This is the case of the ACR system for light rail, which enables higher levels of energy efficiency, and of driverless subway systems. It is also one of the leading providers of high added value solutions for tram systems in Germany, the United States, France, the United Kingdom and Sweden, among others.

It has designed and constructed the first subway line in the city of Algiers, among others.

Also, the subway line that links New Delhi airport with the capital.

The most important rail concession in the whole of the American continent, System 1 of the suburban railway in Mexico, was executed by a consortium led by the Spanish company CAF. This involves the construction, operation and maintenance of the suburban railway for 30 years. Spanish companies ADIF, INECO, OHL, INDRA and INABENSA also participated.

The first tram line in North Africa is being built in the Algerian city of Ouargla by the Spanish companies, ASSIGNIA and ELECNOR. It connects the old town with the university campus on the outskirts. They are also building a maintenance centre for 23 stations that will be established in the city.

CAF is also one of the world’s principal providers of high added value solutions for tram systems. Its Urbos platform for low-floor trams has been contracted by public transport authorities in countries like Germany, the United States, Estonia, France, Hungary, Luxembourg, the United Kingdom and Sweden, among others. In Asia, it will build the first tram to incorporate Greentech technology for operation without overhead power cables in a section of almost 9km in the Chinese city of Kaoshing.

KEY FACT

The lines of the world’s longest subway under construction are being built by a Spanish company.
Renewable energies represent around 40% of the generation mix in Spain. Its companies therefore occupy the top places in the global ranking of the different sources. These companies are also leaders in transmission and operation of the electricity system, in Natural Liquefied Gas terminals and in turnkey refinery construction. Moreover, the Spanish nuclear industry is present in the projects of over 40 countries in four continents.

04.01. RENEWABLES: WIND, SOLAR, BIOMASS-BIOFUEL AND HYDROELECTRIC ENERGY

Spain is a world leader in all areas. It boasts an industrial fabric with companies that are prominent in the international arena, established worldwide and heavy investors in R&D&I. This places them in a position of competitive advantage compared to the rest of the world. Recent years have seen the implementation of a policy that promotes renewable and clean energies. The Spanish model is internationally recognised. In Spain, the contribution of renewable energies to the generation mix is already around 40%. Spanish companies, in consequence, occupy the leading positions in the global ranking in the different sources. Here are some facts that confirm this:

1 > Spain is Europe’s second biggest generator of wind power and the world’s fourth for installed capacity (approximately 22,974 MW at the close of 2014).

2 > It has the fifth largest capacity in photovoltaic solar power in terms of installed power (4,772 MW) in Europe and the eighth in the world.

3 > It has the world’s largest installed solar thermal power capacity (2,250 MW, at December 2014), with power plants operating commercially using the four available technologies: tower, parabolic trough, fresnel and discs. Spanish companies carry out 73% of the projects in the world.

4 > It is the EU’s sixth leading primary energy producer of biomass.

5 > It is the EU’s third leading country in installed hydroelectric power (13,801 MW).

6 > It is the EU’s third leading country in installed hydroelectric power (13,801 MW).

7 > Spain is the world’s second country with the most renewable energy patents per capita, only behind Germany and ahead of the United States.

1. Source: all data on installed power of all types come from BDFER/IDEA and figures at the close of 2014 are provisional
It is fifth in absolute terms and seventh in investment (Spanish Photovoltaic Union Report).

8 > The world’s leading producer of renewable energy is Spanish and it is also one of the five biggest electrical companies in the world.

9 > The company with the world’s largest photovoltaic installed capacity is Spanish.

10 > The world’s leading companies in the thermoelectric sector are Spanish.

11 > The world’s largest fourth wind turbine manufacturer in accumulated market share at December 2014 is Spanish.

Detailed analysis of energy sources reflects the following position:

04.01.01. **Wind-assisted: Wind power**

1 > Spain is Europe’s second country in wind power generation and the world’s fourth in installed capacity (22,974 MW). It also has a thriving industrial fabric, with a presence throughout the world, especially in the US, China, Latin America, India, South Korea, Australia, North Africa and the rest of the EU.

2 > A Spanish company, IBERDROLA, is the world’s leading producer of renewable energies, principally wind, with an installed capacity of over 6,100 MW in Spain and over 15,000 MW in the world (figures at the close of 2014). It has developed both onshore and offshore farms.

► It is one of the world’s largest electricity companies by market capitalisation, with activities in the Atlantic area, principally Europe, the United States, Mexico and Brazil. It provides electricity to 120 million people and is strongly committed to the use of cleaner, more environmentally-friendly production technologies. 62% of its installed capacity and 57% of its production is emission-free, a percentage that rises to 91% and 72% in Spain respectively. Therefore, it emits 30% less CO2 per kWh than the European electricity sector average.

► It is among the world’s technological leaders in wind turbine design, manufacturing, installation and maintenance, as well as being a global benchmark in the promotion and sale of wind farms. It has 33,000 MW installed in 54 countries worldwide.

► It is a sectoral leader in Mexico and India, the second wind turbine manufacturer in Brazil and the top foreign manufacturer in China.

3 > The world’s largest fourth wind turbine manufacturer in terms of accumulated market share is also a Spanish company, GAMESA. It is one of world’s technological leaders in wind turbine design, manufacturing, installation and maintenance, as well as being a global benchmark in the promotion and sale of wind farms. It has 33,000 MW installed in 54 countries worldwide.

► It is the world’s leading wind power producer with 14,000 MW of installed capacity.

► It is one of the leading electricity operators in the United Kingdom and a leader in wind power in the country following its acquisition of Scottish Power in 2007. It possesses one of Europe’s largest onshore wind farms, Whitelee, which has a capacity of over 500 MW, sufficient to supply electricity to 300,000 homes. In 2015, the group’s first offshore wind farm, West of Duddon Sands, entered into operation (389 MW), the first to be implemented by a Spanish company. It is also developing the offshore farms of East Anglia (1,200 MW, United Kingdom), Saint Brieuc (500 MW, France) and Wi kinger (350 MW, Germany).

► It is among the top 10 electricity companies in the United States, following the acquisition of Energy East, now IBERDROLA USA, and the integration agreement with UIL Holdings, which is expected to be finalised at the end of 2015.

► It is Brazil’s top electricity company after its acquisition of Elektro.

► It is the leading private energy generator in Mexico, with 5,300 MW of installed capacity, and the country’s second electricity producer.

► It is the fourth largest wind power manufacturer in Europe and the ninth in the world in terms of number of patents.

► In 2015, Gamesa and the French group Areva agreed to create a new company called Adwen, a joint venture headquartered in Zamudio (Spain).
The two groups each hold a 50% stake in the development of the offshore wind business.

4 > The world’s sixth company in wind power installation is ACCIONA, which is also Spanish. It is present in the entire value chain of wind power, from wind turbine design and manufacture to the development, building, exploitation, operation and maintenance of farms. It is the world’s second leading company in terms of the number of countries with assets. It is the leading wind power producer in Mexico and it runs Latin America’s largest complex with this technology.

5 > Latin America’s third largest wind power project, the Bií Híoxo Farm in Mexico, which has 117 wind turbines and 234 MW of capacity, was developed by a Spanish company, GAS NATURAL FE-NOSA.

6 > ELECNOR, for its part, has developed in Brazil one of the continent’s largest wind farm complexes in the state of Rio Grande do Sul where it has 564 MW authorised and 320 MW in operation. This adds to other farms the company has developed in Canada, Spain, Chile, Jordan, Mauritania and Kuwait.

7 > The Spanish company, NAVANTIA, will manufacture five floating structures of a SPAR type for 6MW turbines for the world’s first floating wind farm in Hywind, Scotland, in conjunction with the Windar renewable energy company. It has also contributed to the Wikinger offshore farm, built by the Spanish company IBERDROLA.

8 > A Spanish company, INGETEAM, is among the world’s top 10 companies devoted to the operation and maintenance of renewable energy facilities. In addition, 8% of the world’s wind turbines use its equipment.

9 > Other companies, such as TECNALIA, GESTAMP WIND, ORMAZÁBAL, IDESA, VICINAY CADENAS and BARLOVENTO, also thrive in this sector. Special mention should be made of technology centres like CENER, IRCE or the IREC, which participate in key R&D&I projects for improving the global competitiveness of wind power technology. Technological advances are ongoing and some leading manufacturers like GAMESA and ACCIONA have developed new competitive prototypes which are also adapted to the offshore environment.
04.01.02. Solar Power

Spain’s climatic characteristics and the huge R&D investment by its companies, which has equipped them with leading technology in every discipline, has led the country to become a global leader in both photovoltaic and solar thermal power. Spanish companies are pioneers in electricity generation using solar concentration technology. In addition, one of the characteristics that place the sector’s Spanish companies among the world’s most competitive is their capacity to deliver integrated solutions to adapt their technology to their customers, according to the needs of each and according to the country and its local needs. The sector’s leading Spanish companies represent large business groups that encompass the energy, engineering and construction sectors and deliver integral solutions to their customers.

1. Photovoltaic solar power

- Spain is Europe’s third leading country in generated photovoltaic solar power, fifth in installed capacity and the eighth in the world, with an accumulated power of 4,772 MW. Spanish companies embrace all the activities related to the industry, covering the entire silicon production chain and all the electronic processes for producing polysilicon, ingots, wafers, cells and modules. In the field of concentrated solar energy, Spain is the world’s leading country in terms of installed capacity of commercial systems, with a very strong associated industry at global level. There are approximately 30 centres (universities, private and public centres) which are devoted to R&D in photovoltaic energy.

- The leading company in photovoltaic installed capacity is Spanish, ISOLUX CORSÁN, which is present in 30 countries.
  - It has built the largest installation in Europe, located in Italy.
  - Beyond Europe, its powerful presence is noted in India, where it has launched its second large photovoltaic plant.

- One of the world’s largest photovoltaic solar plants (94.3 MWp) was built and is operated in South Africa by a Spanish company, ACCIONA. At the time of its launch, it is the photovoltaic plant with the highest output in Africa.

- The largest photovoltaic plant in Central America is being built in Guatemala by a Spanish company, the ORTIZ GROUP. With 58.4 MW of power, it will supply energy to some 30,000 homes. This project, together with others that are being constructed in Guatemala and also in Honduras,
makes the ORTIZ GROUP the biggest construction company in Central America.

- The world’s top manufacturer of Silicon metal is also a Spanish company, FERROATLÁNTICA, a 100% subsidiary of the VILLAR MIR GROUP.

- The world’s largest solar photovoltaic power plant in the automobile industry is located on the premises of the Spanish company, SEAT, in Martorell (Spain).

ELECNOR has 300 MW installed and distributed between facilities built in Australia, Spain, the United States, France and Italy.

2 Solar Thermal Power

- Spain is the country with the world’s largest installed capacity (2,250 MW), with power plants operating commercially using the four available technologies: tower, parabolic trough, fresnel and discs. The world’s leading Spanish companies in the thermoelectric sector are Spanish. Huge endeavour in R&D&I has led to the development of world-leading technology, which at present forms part of 64% of the solar thermal projects under construction. The Almería Solar Platform is the world’s most prestigious publicly-led CSP Research Centre.

- The Spanish company ABENGOA is a world leader in the solar thermal power sector:
  - The world’s top commercial tower technology was built in 2006 by ABENGOA.
  - The world’s top commercial plants using parabolic trough collector technology are Spanish, including those of SOLANA (Arizona) and MOJAVE (California) in the United States. SOLANA will be the world’s largest solar plant. It will store 6 hours of thermal energy, which enables energy to be produced in cloudy spells and after sunset and will avoid the emission into the atmosphere of 475,000 tons of CO₂ a year. The world’s most important private solar thermal research centre, the ABENGOA SOLUCAR PLATFORM in Seville, is Spanish.
  - ABENGOA also built the largest plant in the Middle East, Shams-1 (Abu Dhabi, United Arab Emirates) which uses parabolic trough technology. The company will also be responsible for its management and maintenance.
  - The construction of the first solar thermal plant in South Africa (Kaxu) with parabolic trough technology has been completed. At present, the company is building two other plants, one with parabolic trough collector technology and the other with tower technology, which together will form the largest solar power platform in Africa.
  - In Chile, ABENGOA is building the first solar thermal plant in Latin America, with 110 MW and 17.5 hours of thermal storage with molten salts. Together with a photovoltaic plant, the Atacama 1 complex will have a total capacity of 210 MW.
  - ACS-COBRA occupies third place in the world in solar thermal power.
  - ACCIONA is the world’s fifth largest company in the solar thermal sector. It is a global pioneer, with the launching in 2007 of Nevada Solar One, which was the world’s largest solar thermal plant in the Nevada Desert (USA).

- SENER leads the solar thermal energy market both in terms of the number of pipeline projects, most built under the turnkey method, and the development and incorporation of technological solutions with their own patents, which produce major savings in CO₂.
  - The world’s first plant to commercially apply the molten salt thermal storage system in the form of a central tower and a heliostat field is the Gemasolar Plant in Seville. Run by TORRESOL ENERGY, this plant was also the world’s first to produce electricity for 24 hours a day by using only solar energy. Storage allows a clean source like solar power to become manageable.
  - The world’s biggest solar thermal complex is being built. This is the Noor project (comprising the Noor I, Noor II and Noor III plants) in Morocco. It will have an installed capacity of 510 MW.
  - The solar thermal plants applying SENER’s technology, either already in operation or cu-

KEY FACT 78% of projects related to solar thermal energy are undertaken by Spanish companies
Currently in construction, represent 35% of the MWe originating from solar energy worldwide.

- ABANTIA and COMSA have designed and built the world’s first hybrid biomass-solar thermal plant on a commercial scale, the Borges Solar Thermal Plant. This will enable continuous 24/7 electricity generation.

- Many Spanish companies also form part of the industrial fabric of the solar thermal market through the manufacture of key components. These include RIOGLASS SOLAR, the manufacturer of mirrors for solar thermal plants and high-efficiency receiver tubes for electricity generation plants through solar radiation.

  - It has plants in the United States, Chile, South Africa. One is also under construction in China, mainly to supply the country’s emerging market.

  - It is the global leader in the manufacture of optical components, which form the heart of solar plants, both for thermal solar energy (CSP) and for photovoltaic concentration (CPV).

  - It has participated in the following plants: Solana, Mohave and Crescent Dunes (United States), Khi Solar and Kaxu Solar (South Africa) and Atacama (Chile), among others.

04.01.03. Biofuels and biomass

1 > One of the world’s largest producers of bioethanol, and the only company with a presence in the sector’s three leading markets (US, EU and Brazil), is a Spanish company, ABENGOA BIOENERGÍA. The volume of resources devoted by the company to technological innovation is particularly significant, having made it a technological leader in fields like cellulosic bioethanol production.

- It has been selected in a consortium with Toshiba Corporation to build the world’s largest newly-built biomass-fired steam power plant in the United Kingdom, with a capacity of 299 MW of electric power and steam.

- It is also building a biomass-fired power and steam plant in Ghent (Bélgica) which, until the awarding of the UK plant, was the biggest in the world.

- It is building one of the first second-generation bioethanol plants for commercial operation in Kansas (United States).

- It is also building the United States’ first bio-refinery for producing biofuels from solid urban waste.

2 > One of Europe’s top biodiesel producers is INFINITA RENOVABLES, with an installed capacity of almost a million tonnes a year. Other important companies are BIO-OILS and ACCIONA.

3 > Spain is the EU’s sixth leading primary energy producer and it boasts technological and industrial experience in most subsectors in this field, from the obtaining of resources to the production of fuels, technologies and applications, both thermal and electric.

04.01.04. Hydroelectric power

1 > Spain is the third leading country in the European Union in terms of installed hydroelectric capacity (18,801 MW) and it has companies which produce the capital assets for these plants.

2 > One of the world’s top hydroelectricity generators, with over 20,600 MW of installed capacity, is a Spanish company: IBERDROLA. It has great experience in pump technology and owns the hydroelectric complex in La Muela (Valencia), Europe’s biggest plant for this type of technology.

3 > The leading privately-run electricity producer in Costa Rica is a Spanish company, GAS NATURAL FENOSA.

04.02. ADVANCED NETWORK MANAGEMENT

1 > The world’s leading company specialising in the transmission and operation of the electricity system is Spanish: RED ELÉCTRICA DE ESPAÑA (REE). It is currently the sole transmission system operator (TSO) of the Spanish system. Its model has been subsequently implemented in other
countries. At present, the company owns over 42,000 km of transmission lines in Spain, managing the electricity control centres that ensure the stability of the Spanish electricity system.

2 > The CECRE (Special Regime Control Centre) is the globally pioneering centre for optimising the way renewables are integrated into the grid, especially wind power. It was created and is run by a Spanish company, RED ELÉCTRICA ESPAÑOLA. The Centre has made Spain one of the countries with the highest renewable energy integration capacity.

► The CECRE supervises and monitors the production of renewable energy facilities or groups of a size greater than 5 MW. Through telemetry, it receives real-time information every 12 seconds from each facility about connection status, the production of both active and reactive power and the voltage at the connection point. This allows for real-time analysis of the situation and provides for the operational measures necessary to maintain the system in a safe state. This results in the management of over 30 GW of installed renewable generation on the Spanish Peninsula. The CECRE’s work has made it possible for renewable energy generation to have represented nearly 40% of the annual energy production in the Spanish peninsular’s electricity system in recent years, reaching in some cases hourly coverage values of over 80%, with the consequent reduction in external energy dependency.

► A notable advance is the new direct current interconnection between Spain and France, a project declared as being of European interest and developed in conjunction with RTE. This is a pioneering project and a technological challenge that enables the duplication of the commercial capacity of exchange between Spain and France from 1,400 to 2,800 MW. The interconnection between the Spanish Peninsula and the Balearic Islands, whose development is a global benchmark due to its singular nature and technical complexity, highlights the company’s outstanding technological capacity. This is the first sub-sea direct-current transmission line in Spain. Its maximum depth is 1,485 metres, the second deepest of its type in Europe. The project allows the islands to integrate into the Iberian electricity market and provides them with a competitive generation market.

3 > IBERDROLA is one of the world’s largest electricity network operators with a million kilometres of power lines and a distribution area of one million sq. km.

► It is the third leading network operator of networks in the United Kingdom.

► It distributes electricity and gas in the states of New York and Maine (United States) and Brazil, where it has a 17% market share.
It is developing key projects including the interconnection between the United States and Canada and the sea interconnection between Scotland and Wales of over 420 km, the world’s longest DC power line.

It is a pioneer in the development of Smart Networks. In the United States, it already has 600,000 supply points.

ACCIONA has the world’s largest control centre for renewable energy facilities, from which it manages over 11,000 MW relating to wind farms, hydroelectric facilities, photovoltaic and solar thermal power stations and biomass plants, spread across the globe.

The company with the most Liquefied Natural Gas terminals is a Spanish company, ENAGAS, with eight regasification plants.

A Spanish company, GAS NATURAL FENOSA, is Latin America’s leading and largest integrated natural gas and electricity company and the first distribution operator in Latin America. It operates in over 30 countries, has over 23 million customers and an installed capacity of 15,500 MW globally and is the leading gas distribution operator in Latin America.

It is present in seven of Latin America’s nine major cities, with notable activity in Chile, Mexico and Colombia.

Through CGE, it is Chile’s most important integrated gas and electricity group, with over 3.5 million customers, 40% of the Chilean electrical distribution market, 80% of the natural gas distribution market and 30% of LPG.

In Mexico, it has around 1.5 million customers in 10 of the country’s states including the capital, Mexico City. Added to these states are two new ones, Sonora and Sinaloa, whose concession was awarded to the company in 2014.

Through Global Power Generation (GPG), the group has integrated its international generation assets in Costa Rica, Puerto Rico, the Dominican Republic, Panama, Kenya, Australia and Mexico. This subsidiary has an installed capacity of 2,871 MW and a project portfolio of around 5 GW.

It is one of the world’s leading LNG companies and a benchmark operator in the Atlantic and Mediterranean basins with a large LNG fleet.

The world’s largest research centre devoted to fusion energy, ITER in Cadareche (France), will be built by a Spanish company, FERROVIAL, in consortium with other companies.
9 > Latin America’s largest energy project in recent years, the South Peru Gas Pipeline, with a length of over 1,000 km, is developed by a Spanish company, ENAGAS, together with one from Brazil and also with the participation of Spain’s ELECNOR. This project will be vital for safe supply and Peru’s economic development. It recently won the prize for the Engineering Project of the Year in Latin America at the 13th Latin American Infrastructure Forum.

10 > The world’s first installed offshore gas terminal, the Liquefied Natural Gas storage caisson for the Adriatic Coast, which also holds the European record for the largest sliding surface, was built by a Spanish company, ACCIONA.

11 > One of China’s most important LNG terminals was also built by a Spanish company, TECNICAS REUNIDAS.

12 > Europe’s first regasification plant is owned by a Spanish company, ENAGAS, which has the most facilities of this type in the world. It is a global benchmark in the creation of gas infrastructures, the transportation of natural gas and the operation, management and maintenance of gas networks. It is present in eight countries (Spain, Mexico, Chile, Peru, Sweden, Italy, Greece and Albania) with a clear commitment to help integrate markets and develop interconnections:

- It holds 16% in the Trans Adriatic Pipeline (TAP) that will link Turkey, Greece, Albania and Italy. This forms part of the Southern Corridor to supply Europe with gas from the Caspian Sea and is strategic for the safety of the European supply.

- It promotes the development of the connection with France through the Pyrenees (MIDCAT), which will make Spain a gas-transit country and enable Europe to diversify its supply sources.

13 > A Spanish company, CEPSA, directed the construction of the MEDGAZ gas pipeline. With an annual capacity of 8,000 million cubic metres, it is one of the world’s two deepest marine gas pipelines and the one with the greatest diameter. It connects Algeria and Spain and reaches a depth of 2,000 metres in the Mediterranean.

14 > Other Spanish companies occupy leading positions in the installation and maintenance of high-tension transmission and distribution electricity lines. ISOLUX-CORSÁN is one of the world’s leading operators, accumulating over 10,000 km of lines either built or in the installation phase in the United States, Latin America and Africa.
NER is developing large industrial plants in Latin America, especially in Mexico, while COBRA and ELECNOR also stand out in the sector.

04.04. PETROLEUM: REFINERIES AND TURNKEY PLANTS

1 > A Spanish company, TÉCNICAS REUNIDAS, occupies seventh place in the world in the industrial petroleum sector, third place in the Middle East; and seventh in the Latin America, according to the international ranking of Engineering News Record (ENR).

- It is the global leader in the turnkey construction of refineries.
- It is one of the international contractors to hold the most contracts with the Saudi company Saudi Aramco (eleven at a value of US$ 9.55 billion).

2 > It is one of the international contractors to hold the most contracts with the Saudi company Saudi Aramco (eleven at a value of US$ 9.55 billion).

- It is also performing the contract for the modernisation of the Talara refinery for the Peruvian company Petroperu, the largest contract that has been awarded to a single turnkey contractor in the hydrocarbons sector.

- It has recently been awarded the new RAPID refinery for Petronas in Malaysia, which forms part of the country’s largest infrastructure project.

3 > The largest refinery in the Middle East, Al-Zour in Kuwait, will be developed by a Spanish company, TÉCNICAS REUNIDAS, under the turnkey method.

4 > The Spanish company, REPSOL, is one of the world’s top private equity groups. It is present in over 40 countries across the globe and strategically placed in the world’s hydrocarbon-prolific areas. It is mainly present in geopolitically stable countries (OECD).
It is among the world’s best explorers, with over 40 oil discoveries since 2007, including eight of the world’s largest.

It has top-quality production assets across the globe.

It is a European leader in refining, ensuring consistent quality of supply to the southern part of the continent.

It is one of the principal suppliers of aviation fuel to commercial airlines worldwide.

The Cartagena refinery is one of the most efficient in Europe with regard to energy and the environment.

Its Technological Centre is a leader in Europe and develops strategic projects to generate more efficient and environmentally sustainable energy systems. It has technology hubs in Houston (United States) and Rio de Janeiro (Brazil).

Its Kaleidoscope project, which uses 100% Repsol technology for the processing of seismic images and is environmentally friendly, has been recognised as one of the world’s five most innovative projects by the American Institute of Electrical and Electronic Engineers.

The Spanish company, CEPSA, is a world leader in the production of LAB, a raw material for biodegradable detergents, which uses DETAL technology, a pioneering catalytic chemical process developed by CEPSA and UOP. It has plants in Canada, Brazil and Cadiz (Spain), with a global capacity of 560,000 tonnes/year.

The world’s second largest phenol producer and the first in cumene, raw materials for the manufacture of a great variety of products in multiple sectors, is the Spanish company, CEPSA. In 2015, it opened a major plant in Shanghai (China), with capacity for 250,000 tonnes of phenol, 150,000 tonnes of acetone and 360,000 tonnes of cumene.

A Spanish company, CLH GROUP, is the biggest European manager of refined product pipeline networks, with a total length of 6,000 km.

It is the world’s seventh company and Europe’s second for volume of storage capacity for oil products, with a total of 8 million cubic metres.

In collaboration with the Omani company ORPIC, it leads the biggest project under development in Oman for the construction of logistic fuel infrastructure. It will equip the country with a 300-km gas pipeline and a new storage installation in the vicinity of Mascate.

It manages the United Kingdom’s principal gas pipeline network through its subsidiary: CLH-PS. This logistic system comprises 2,000 km of pipelines, 50% of those existing in the country, and 16 facilities, with a storage capacity of over a million cubic metres.

Nuclear power in Spain is a competitive, consolidated and experienced industry that covers the entire value chain of nuclear activity. This includes initial studies, conceptual design, construction, fuel manufacture, the development of operation and maintenance engineering, the supply of equipment and components, the management of nuclear waste, the decommissioning of facilities and participation in new developments and R&D&I programmes. Spain participates in international programmes for the research and development of nuclear plants and in the International Nuclear Fusion Project (ITER), one of the most ambitious international scientific projects of our time, which tests the viability of fusion as an energy source. In addition, the companies of the Spanish nuclear sector have embraced the concern for environmental preservation, applying technologies to keep impact to a minimum, conserving biodiversity and making savings in energy and CO2 emissions.

It is present in the nuclear projects of over 40 countries in 4 continents. Its experience is a benchmark in other countries, where Spanish companies provide support services in the operation and maintenance of nuclear facilities:

ENRESA (the National Radioactive Waste Company) is an international benchmark, both in

The largest European manager of refined product pipeline networks is Spanish.
radioactive waste management and in nuclear facility decommissioning projects.

2. A Spanish company, IDOM, is the leader in terms of the number of engineering contracts in the ITER fusion project (Cadarache, France).

3. Another Spanish company, TECNATOM, is one of the world’s leading companies in the design and supply of advanced control rooms and full-scope simulators for nuclear plants in China, Taiwan, Brazil and Argentina.

04.05.01. Fuel

The design, manufacture and supply of fuel for nuclear plants is carried out by the public company ENUSA Industrias Avanzadas, which is involved in the supply of raw materials and its processing until the final creation of the product.

► Over the past year, ENUSA Industrias Avanzadas devoted 72% of its production to the export of fuel elements for nuclear plants in Belgium, France and Sweden.

► In its factory in Juzbado (Salamanca), it has designed and manufactured fuel elements for five Swedish nuclear plants.

04.05.02. Equipment supplies

The Spanish companies that manufacture equipment possess a recognised quality. They embrace everything from the production of main equipment to turbine-alternators, valves, cranes, pipes, boilers or equipment for fuel handling and storage. This is both geared to Spanish and foreign nuclear plants, with 80% of its production devoted to exports.

► The public company, ENSA, is a leader in the field of technology. In the past year all its contracts for large components have been devoted to exports.

► Another Spanish company, RINGO VÁLVULAS, is a benchmark in the manufacture of nuclear valves destined for facilities in Argentina, Belgium, Bulgaria, China, Finland, Mexico, Romania, Russia, Slovakia, South Africa, Sweden and Switzerland.

► TAIM WESER, the leading company in the supply of overhead cranes and special gantries for the handling of medium and high-activity nuclear waste and nuclear fuel, participates in international projects.

04.05.03. Engineering and services

Spanish engineering and service companies have created significant capacity in nuclear plant engineering. This has enabled them to participate in the world’s principal nuclear projects, in which they have provided support in the planning, design and management of the construction of new plants and in the operation and maintenance of those already operating. These companies are highly diversified in their work, exporting over 60% of its annual production and attaining in some countries figures close to 100%.

1. GD ENERGY SERVICES advises the United Nations with regard to radiological impact on the population.

2. The Spanish company VIRLAB is the European benchmark for the rating of equipment with regard to seismic, vibrant and shock environments.

04.05.04. Decommissioning and waste

Spain is a global benchmark in radioactive waste management and in nuclear plant decommissioning projects.

1. The storage facilities for radioactive waste and decommissioning projects managed by the public company ENRESA, the National Radioactive Waste Company, have been visited by delegations from over 15 countries. They are described as some of the world’s most advanced.

2. GD Energy Services, a company specialising in technology at the service of the energy sector, is the leading Spanish company in terms of the number of nuclear facility decommissioning contracts at international level.

04.05.05. Research and development

Spain forms part of international programmes for the research and development of advanced nuclear plants, in programmes based on nuclear fusion and on the physics of high energies. It is widely represented in CERN, the European Orga-
04.05.05. **ITER Project**

Spanish companies IDOM, ENSA, EMPRESARIOS AGRUPADOS, IBERDROLA INGENIERÍA Y CONSTRUCCIÓN and SENER are leading participants in the construction of the most ambitious international science project that tests the viability of fusion as an energy source: the ITER International Project, which is under construction in Cadarache (France).
Other technologies to protect the environment

Spain ranks third in the world and first in the European Union in the number of ISO 14001 certificates for environmental management systems. The country is an international benchmark in the comprehensive water cycle, in waste management and treatment and in sustainability as the focus of business. Its companies deliver solutions to the most pressing problems of our time.

05.01. COMPREHENSIVE WATER CYCLE

The Spanish Water Governance system is a global benchmark and a model of success, both in the Mediterranean region and in other geographic zones with similar water resource scarcity challenges. The development of appropriate management of water, which is synonymous with life, health and energy and increasingly scarce, is ever more important. Spain has been aware of this. The joint efforts of Public Administrations and companies, who have invested significantly in R&D, are the key to the success of the Spanish model. Water management requires the development of a series of technologies in which Spain and its companies are global benchmarks.

1 > Spain is a world leader in all the stages of management of the comprehensive water cycle:

► Spain is the leading producer of desalinated water in Europe, the American continent and the Middle East.

► Spain is number one in Europe in the reuse of treated water. It is number two in the world for reused water and stands out in terms of both its regulatory and technological framework.

► Spain ranks number four in the world for installed desalination capacity (three million cubic metres per day).

► Spain leads the first European coordination initiative in the water sector, JPI Water. This efficiently and sustainably coordinates European R&D+I with regard to water.

► Spain is a technological leader in the area of greenhouses.

► Spain is a technological leader in the area of greenhouses.

► ACCIONA is a global leader in sea water desalination and brackish water reverse osmosis desalination, both in technological development and the construction of desalination plants. The company has built over 70 desalination plants and has facilities in the United States, United Kingdom, Italy, Peru, Cape Verde, Algeria, the United Arab Emirates and Qatar, with a capacity exceeding 2.7 cubic metres of desalinated water a day.
• ACCIONA is building the world’s largest water treatment plant in Mexico, in addition to another 10 water desalination, treatment and purification projects in Latin America.

• Two of the largest desalination plants are being built by ACCIONA in Australia and Saudi Arabia.

• ACCIONA also built the desalination plant at Beckton in London. This is the first to be installed in the UK and is notable for using renewable energies and reusing 85% of the energy consumed in the desalination process. It has received several prizes.

• The largest desalination plant in the United States is at Tampa and was built by ACCIONA.

• It has also built one of the world’s largest plants in waste-water treatment, the Atotonilco plant in Hidalgo, Mexico. It will serve 10.5 million inhabitants.

► FCC AQUALIA is Europe’s third ranking company and the world’s sixth for comprehensive water management. It serves 23 million people in 22 countries.

• The El Realito macroproject in Mexico, which will supply one cubic metre of water/second, was carried out by FCC AQUALIA. The company also met the challenge of increasing the supply system of the metropolitan area of Mexico City by means of the Cutzamala project. It currently boasts a drinking water supply capacity of 20 cubic metres a second, the highest in Latin America.

• A consortium headed by FCC AQUALIA has just been awarded the macroproject for the design, construction and operation of the Abu Rawash treatment plant in Cairo (Egypt). One of the world’s largest, it will treat 1.6 million cubic metres of water a day and serve 5.5 million people.

• The maintenance operation for the two largest treatment plants in Mecca in Saudi Arabia is also performed by FCC AQUALIA. They will serve a population of 1.5 million inhabitants, a figure which swells due to the influx of pilgrims.

• It also runs the sanitation and water treatment system of the eastern area of the Emirate of Abu Dhabi, with a length of 2,400 km, in a consortium with a local company.

► ABENGOA WATER has built the first desalination plants in India (Chennai) and Ghana, together with its first desalination plant in Chile.

• It has been selected to develop the world’s first desalination plant to function with solar energy. This will be built in Saudi Arabia and will have the capacity to desalinate 60,000 cubic metres of water a day.

► CADAGUA (FERROVIAL) is the world’s first company to develop a sludge treatment plant by gasification. It was also the first company in Europe’s desalination sector to receive the EMA certificate.

• In addition, one of the largest desalination plants in Perth, Australia, was built through a joint venture between two Spanish companies, TÉCNICAS REUNIDAS and VALORIZA AGUA (SACYR). They are also undertaking the second phase of the plant’s expansion project in order to double production: first phase: 150,000 cubic metres/day and second phase: 150,000 cubic metres/day.
One of the largest plants in the Mediterranean basin (384,000 cubic metres/day), Israel’s Ashdod desalination plant, is being built by a Spanish company, SADYT (SACYR GROUP).

The Spanish company, AGBAR, is also a global benchmark in the management of the comprehensive water cycle (supply, distribution, drainage and treatment). It runs over 1,900 facilities and approximately 1.5 million km for distribution and is present in Algeria, Brazil, Chile, Colombia, United States, Mexico, Peru, United Kingdom and Turkey among others.

- It has built the La Farfana water treatment plant in Chile, a pioneer in the processing of the biogas generated in the plant. It is also treated and injected as methane into the network, thereby adding value to the sludge of waste water.

The European company with the most experience in irrigation modernisation, is Spanish, TRAGSA. The Group’s excellent understanding of comprehensive water management enables it to specialise internationally in the design and implementation of projects for supplying water and providing appropriate sanitation systems in remote rural areas.

Also of note is its development of tools for hydrological planning, which range from providing specific assistance to catering for the needs of each of the different administrations. This is one of the principal lines of the TRAGSA Group’s international work.

A Spanish company, TYPSA, undertakes revision of the project and supervision of the work to supply water to the city of Riyadh and to four storage deposits that form the city’s strategic reserves.

Spanish companies are also a global benchmark in waste management, having created a comprehensive management sector in this field. This has won them many projects throughout the world:

1. A Spanish company, BEFESA, is Europe’s first to recycle steel and galvanisation waste. It has treatment plants in France, Germany, Sweden, Turkey and South Korea, with the latter two full of potential. In South Korea, the company is building its second oven, which will double its waste treatment capacity.

- It has half of Europe’s recycling market for steel and galvanisation waste.

- It is a European leader in aluminium waste recycling, treatment of salt slag and spent pot liner (SPL). The company possesses a recycling capacity of 630,000 tonnes/year for salt slag and SPL and production of 210,000 tonnes/year of secondary aluminium alloys, the European market being approximately 1 million tonnes. It carries out integrated recovery of aluminium waste and scrap, salt slag and SPL, producing aluminium alloys, salt fluxes, ammonium sulphate and aluminium oxide. All of these have significant industrial applications for the car industry, farming, road surfacing, brick manufacturing etc. It opts for consolidated markets such as Germany, with new facilities like Bernburg and new construction projects in the United Arab Emirates.

2. Another Spanish company URBASER (ACS Group) is a leader in the management of urban waste. It has the world’s highest number of urban waste treatment plants under its management.

3. A Spanish company, FCC, is the leader in waste management in Central and Eastern Europe. It is also the United Kingdom’s fifth waste management and treatment company in terms of revenue.

**KEY FACT**

Spain is the leading producer of desalinated water in Europe, the American continent and the Middle East.
It serves 13 countries, attending to 53 million people.

4. FERROVIAL SERVICIOS is a global benchmark in the efficient provision of urban and environmental services, with a significant presence in the United Kingdom.

Spanish companies have placed sustainability at the heart of their business model. The largest of these are present in the principal sustainability indices, which measure the quality of management and governance of companies.

Spain tops the world ranking in the number of leading companies that create high-quality sustainability reports.

Spain has the eighth most sustainable in the ranking of 46 international stock exchanges. It is the world’s fourth leading country with the most groups ranking first in the annual table of sustainable countries. This data comes from the Sustainability Yearbook, published by ROBECOSAM and KPMG, which gathers 15% of the world’s best corporations from 58 sectors and evaluates a total of 2,000 companies:

- ACCIONA is one of the Global Most Sustainable Corporations in the World 2014 and has spent eight consecutive years in the Dow Jones Sustainability Index (DJSI) (Construction Sector until 2012 and Electric Utilities since 2013). It has the top score in the global index for performance against climate change in the CDP.

- CLH is the world’s second most sustainable company in the sector of companies devoted to the transportation and storage of oil and gas, according to The Sustainability Yearbook 2015 report.
GAMESA has maintained a continued presence in the FTSE4Good index series since 2005 and it is a founding member of the Ethibel Sustainability Index (ESI) Excellence Europe. Similarly, it is acknowledged to be among the world’s 18 best companies for its sustainability performance within the Machinery and Electrical Equipment sector, according to The Sustainability Yearbook 2015 report.

ENAGÁS has been a member of the Dow Jones Sustainability Indexes for eight years and was recognised as a global leader in the utilities sector in 2011. It is also included in the most important sustainability indices (Global Compact, FTSE4Good, Ethibel, MCSI etc.) and was the only Spanish company and global leader of the Gas Utilities sector in the index “100 Most Sustainable Corporations in the World” in 2015.

GAS NATURAL FENOSA is the world’s leading company in the gas sector, according to Platt’s. It is recognised by the Dow Jones Sustainability Index (DJSI) as one of the world’s most sustainable companies among those of the utilities sector and it was the global leader in 2015. It was first in the world in the gas distribution sector in 2012, 2013, 2014 and 2015 and has been an ever-present in the “FTSE4Good” index since the latter was founded. It was world number one in the utilities sector in the CDP Climate Disclosure Leader 2014 index with a maximum score of 100 puntos. It is the world’s most admired energy company (Fortune).

IBERDROLA is the world’s leading company in the electric power sector, according to the Dow Jones Sustainability Index. It is the first utility company with nuclear assets to be selected in the FTSE4Good index; the world’s second electric company on the Storebrand index; the only company in the utilities sector included in the past 16 editions of the Dow Jones Sustainability Index; and number 2 in the utilities sector in the CDP Climate Disclosure Leader 2014, with 99 points out of 100.

REPSOL is in first place for the second consecutive year in the energy sector’s Green Ranking, which values the environmental practices of the top 500 companies listed on the stock market in the world. It is also a leader in the Oil & Gas sector in the World and European 2012 Dow Jones Sustainability Indices. It has also been recognised for the third time in the last five years for its carbon management and energy efficiency and is number 2 in the energy sector of the CDP Climate Disclosure Leader 2014, with 98 points out of 100.

RED ELÉCTRICA DE ESPAÑA is among the top 13 companies in the electric utilities sector for its excellent sustainability management, winning the RobecoSAM Bronze Class award in The Sustainability Yearbook 2015. It has also been included in the Euronext Vigeo and Ethibel Sustainability Index and recently found its way into the World and European Dow Jones Sustainability Index, where the company is placed among the eight companies selected from the world’s electric utilities sector and
among Europe’s top two with the best sustainability performance.

The Spanish Green Growth Group is a business initiative by the major Spanish companies that lead their sectors of activity and are concerned about compliance with environmental goals. It is a platform for dialogue with the Administration.

However, it is not only companies from the utilities and the oil and gas sectors that lead in sustainability. In all the other sectors, Spanish companies perform responsible, sustainable management:

- **ACS** was the highest valued infrastructure company in the world for ethics in 2014 and is a global benchmark in terms of assessment and of environmental impact reduction, according to the DJSI.

- **AMADEUS** has appeared in the DJSI (IT Services and Internet software and services sector) for the fourth consecutive year. It is also in the Carbon Disclosure Leadership Index due to its environmental policy and results. Its Data Processing Centre is acclaimed for being energy efficient.

- **FERROVIAL** has repeated its presence in the DJSI for the 13th year and it has appeared in FTSE4Good for 10 consecutive years.

- **BANCO SANTANDER** has appeared in the DJSI since 2000, with a score of 86% compared to the financial sector average of 51%, and in FTSE4Good since 2002. It was the greenest bank in 2014, for the third successive time, according to the ranking, The World’s Greenest Banks.

- **INDITEX** is considered by Interbrand to be one of the world’s most sustainable brands. It has appeared for 13 consecutive years, with an overall score of 81% compared to the sector average of 36% in the DJSI and it has appeared in FTSE4Good for 12 years. It has been present from the start in the three CDP questionnaires: Carbon, Water and Forest.

- **INDRA** is the only company in the IT Services and Internet technology subsector that has remained in the global index since its entry in 2006, a total of nine consecutive years.

- **TELEFÓNICA** is a member of the highest DJSI World Index category with 86 points and has appeared in FTSE4Good for 12 consecutive years. It has been among the five leading telecommunications companies for four straight years in CDP and has been cited as a successful case in the OECD’s Corporate Ethics and Compliance Handbook.

- Other Spanish companies from a variety of sectors such as MAPFRE, BBVA, ABERTIS, OHL etc. also enjoy a privileged position in the different sustainability indices.

- **ENAGAS** has built the Green Data Center, a pioneer in data processing in Europe.

- The Spanish firm, TRAGSA, holds the top position in Europe in the execution of sustainable rural development projects. It also delivers innovative solutions for securing the sustainable use of water, saving on great amounts of water.

- Spanish steel companies were the first in the world to adopt a Corporate Social Responsibility strategy by creating the STEEL SUSTAINABILITY MARK. This is a management system that measures their concept of sustainable management. A global benchmark, it recognises their excellence and helps them maximise their reputation.

KEY FACT / The key to the success of the Spanish model of water governance is the joint effort made by Public Administrations and companies
Air and space systems

The Spanish aeronautical industry is fifth in Europe and eighth in the world in turnover and invests heavily in R&D&I. Spain is also seventh in satellite manufacture, with companies and advanced technologies that are global leaders in diverse areas of the sector.

06.01. A SECTOR WITH ITS OWN FEATURES

The Spanish aeronautical industry is fifth in Europe and eighth in the world in turnover and invests heavily in R&D&I. Spain is also seventh in satellite manufacture, with companies and advanced technologies that are global leaders in diverse areas of the sector:

1 > Spain is a European leader in space programmes. It is a founding member of the European Space Agency (ESA) and, since its creation, has taken part in the space programmes with the highest impact. In the exploration of Mars by Curiosity to determine the habitability of the planet, one of its 10 instruments is Spanish, the Rover Environmental Monitoring Station (REMS), which is installed on the Curiosity rover. Since 2012, it has gathered meteorological and seasonal data from the planet and continuously supplied information about atmospheric pressure, moisture, UV radiation, air and ground temperature and the winds of Gale Crater.

- It will provide two further meteorology stations, TWINS (Temperature and Winds for Insight) and MEDA (Mars Environmental Dynamics Analyzers).

- In addition, part of the communications from the planet surface to the Earth is operated with Spanish technology. This uses a High-Gain Antenna, whose pointing mechanism was developed by SENER for Airbus.

- It also participates in other programmes like NOMAD, an instrument for studying the presence of methane gas on Mars. Spanish scientists from the Astrophysics Institute of Andalusia (IAA-CSIC) collaborate on this.

2 > NASA’s only Deep Space Station on European territory is located in Spain: the European Space Astronomy Center (ESAC) at Robledo de Chavela, which recently celebrated 50 years and is essential to NASA space missions. The most advanced missions are developed there.

3 > One of NATO’s two Combined Air Operations Centres in Europe is in Spain: the CAOC in Torrejón de Ardoz (Madrid), which is responsible for the southern flank. The CAOC controls air security from the skies of Europe’s southern flank, from the Azores to Romania and from the Canary Islands to Turkey. This means that the following countries fall within the CAOC’s area of responsibility: Portugal, Italia, Greece, Turkey, Bulgaria, Romania, Hungary, Slovenia, Croatia, Albania, the southern half...
of France and Spain, embracing some 6,500 km from east to west, the entire Mediterranean Sea, the Black Sea and part of the Atlantic. The other CAOC is in Germany and is responsible for the northern flank.

4 > Half of the world’s commercial aeroplanes incorporate Spanish technology.

5 > Spain has the world’s largest and one of the most advanced optical-Infra Red telescope. This is the Great Telescope of the Canary Islands (GTC), which was built by the public company GRANTECAN S.A. Apart from its size, it has other key characteristics, such as the extraordinary quality of the image it provides, which is due to the active adjustment of the optics. Its ultimate aim is to provide scientific observations for the world. Being the world’s largest telescope and thanks to its situation on Roque de los Muchachos, it will enable study of the key astrophysical issues, such as the nature of black holes, the formation history of stars and galaxy when the Universe was young, the physics of distant planets around other stars, the nature of dark matter and the dark energy in the Universe.

06.02. COMPANIES AND PROGRAMMES

1 > AIRBUS GROUP, (a transnational European group in which the Governments of Germany, France and Spain hold a stake - 11%, 11% and 4%, respectively - as majority shareholders) is one of the two leaders in the global Aerospace and Defence sector. The other is Boeing.

► Spain boasts global leadership in military transport, surveillance and security and in-flight refuelling aircraft (it is the world’s leading exporter), with a total of over 1,100 sold.

► Spain is one of only 10 nations in the world with full-cycle capacity (design, manufacture, final assembly and integration, certification, maintenance and modernisation) for planes and helicopters.

► The C235 and C295 aircraft family are present in 70 countries in the world.

► The final assembly line of tactical/strategic A400M military transport aircraft is located in Seville (the only one in the world), where over 174 planes will be manufactured initially.

► Spain leads development of the new generation of A330 MRTT in-flight refuelling aircraft.
Spain participates in the development of the Eurofighter EF2000 combat aircraft, with Madrid hosting an assembly line of 87 planes for the Spanish Air Force.

Spain is also a world leader in the development and manufacture of aerostructures and components in composites, principally carbon fibre.

AIRBUS is the world leader in commercial passenger transport aircraft. Spain is responsible for manufacturing horizontal stabilisers for all Airbus passenger transport planes, ranging from metallic structures (A320 family) to carbon fibre structures (A330, A380 and A350).

AIRBUS HELICOPTERS is a global leader in civil and parapublic helicopters, having produced a third of the world’s helicopter fleet. Components are manufactured in Spain and the country also has a helicopter assembly line.

AIRBUS is a European leader in space programmes and is ranked third in the world among the suppliers of civil and military space systems. This helps to make Spain one of the leading countries in space programmes.

2 ▶ A Spanish company, GMV, is the world’s top independent supplier of Ground Control Systems for commercial telecommunications satellite operators. It is also the third European country in terms of volume of participation in Galileo, a global leader in telematic systems for public transport. 45% of commercial telecommunications satellites launched between 2010 and 2014 use GMV technology.

▶ It is one of the key companies in the development of the Galileo European satellite navigation system.

▶ It is developing the first European robotised laboratory that enables tests to be conducted on the ground, and before the launch, on Guidance, Navigation and Control systems (GNC) for space missions related to the collection of space junk, exploration of the surface of other planets, lunar landings and formation-flying missions.

▶ It has been placed for the third consecutive year in the Top 50 of the Space Manufacturing and Services List created by the American journal Space News, a global benchmark in the aerospace sector.
It has participated in the launch of VEGA VV-02, the smallest rocket in the European fleet.

The Spanish satellite telecommunications operator, HISPA SAT (in which ABERTIS has a majority stake, with 57.05%), is ninth in the world in terms of revenue.

It is present in five orbital positions and has seven satellites in orbit, with coverage over Europe, the American continent and North Africa. It has another three under construction and due to be launched in 2016 and 2017: Hispasat AG1, Hispasat 1F and Amazonas 5. Its satellites deliver a panoply of advanced communication services: dissemination of direct-to-home TV platforms, deployment of corporate telephone and data networks, cellular backhaul networks, mobile broadband with no geographic limitations, governmental communications, comprehensive communication solutions for telecommunications operators, satellite cinema distribution and deployment of tele-education and tele-medicine networks, among others.

It was the first operator to provide Ka band to Latin America.

It is a leader in the development and implementation of Ultra High Definition television and internet access on high-speed trains. This has now been deployed in several European countries.

It also undertakes numerous research projects in the field of telecommunications technologies applied to the strategic areas of innovation, such as emergencies and security, advanced audiovisual systems, mobile communications in maritime, air or ground environments or network convergence.

It is building a new satellite in collaboration with the European Space Agency (ESA). This is Hispasat AG1, which incorporates an innovative regenerative payload, REDSAT, and an active antenna with four beams that are reconfigurable in orbit. All this will enable a more flexible, efficient use of the satellite’s power, thereby increasing transmission capacity substantially.

A Spanish company, SENER, leads the European Space Agency (ESA) programme that develops efficient satellite formation flight technology. It is the principal supplier of deployment instruments or booms for ESA and has provided technology in 16 space missions, including Rosetta, Cluster 1 and II, BepiColombo (the first European mission to Mercury) and Solar Orbiter.

The Rosetta probe is an ESA pioneering project, the first to land on a comet, the 67P/Churyumov-Gerasimenko, and place a robot module on its surface, the Philae lander. The Spanish technology of SENER has been highly important to this mission; it participated both in the probe platform and in the useful payload. The model devised by SENER for Rosetta reduces mass and increases heat emission capacity, which represents a substantial improvement on previous technologies. Rosetta landed as scheduled on 12 November 2014 and was tracked from Earth by various Spanish companies. It is the first time that an apparatus has landed on a comet’s orbit and various Spanish companies (GMV, SENER, CRISA, an AIRBUS DEFENSE AND SPACE company etc.) took part in this landing, with the collaboration of Spanish scientific bodies like the Astrophysics Institute of Andalusia (IAA), the Spanish National Research Council (CSIC), the National Institute of Aerospace Technology (INTA) and UPEM. It marked an unprecedented achievement in the history of space exploration.

It is also the main company to be awarded the contract for the Attitude and Orbit Control System (AOCS/GNC) of the EUCLID Scientific Space Probe, in which it will lead a maximum-performance system for a highly complex scientific mission in the scientific-technological world.

The first satellite to take optical images of the Copernicus Programme, the Sentinel-2 polar orbiting satellite, will also carry SENER’s Spanish technology on a mission led by the European Commission in collaboration with the ESA.

In total, it has delivered over 270 devices and systems that have been successfully launched in satellites and space vehicles for agencies from the United States (NASA), Europe (ESA), Japan (JAXA) and Russia (ROSCOSMOS).

A Spanish company, INDRA, is a benchmark company in Europe in the space and air defence market. This multinational develops radar systems based on in-house technology, electronic defence and self-protection systems, satellite
INDRA forms part of the principal multinational consortia and works on the most technologically advanced programmes, like the development of the Eurofighter combat aircraft, the A400M military transport plane, the Tigre helicopter, the Galileo global positioning system, the Copernicus Earth Observation Programme, the European Space Surveillance and Tracking system (SST). It leads the deployment of the ground segment of the PAZ and Ingenio Earth observation satellites, among others.

The company is responsible for the deployment of the integrated surveillance and air defence system of the Sultanate of Oman, based on the Lanza 3D radar family it has developed. These radars respond to the highest demands set by NATO countries and protect the Alliance’s south-east European flank. The company has exported Lanza radar to various Latin American, European and African countries.

It is also a global benchmark in simulation, with some of its plane simulators being rated as the best in the world by their users. The company has delivered over 200 simulators to 23 countries and over 50 customers, leading projects such as the Eurofighter simulators and helicopter simulators for the manufacturers Eurocopter and Augusta Westland.

In Space, INDRA has deployed all the Telecommand and Telecontrol stations and navigation data Up-link stations that manage Galileo satellites and which are distributed all over the globe.

The Spanish company DANOBATGROUP, which belongs to the MONDRAGÓN Corporation, is a global leader in the supply of high-tech equipment for turbine blade rectification in aircraft, and it currently works with nearly all commercial airlines.

IBERIA is the leading Spanish airline and the ambassador of the Spain brand worldwide. It provides over 600 flights a day to 119 destinations, 23 of which began in the past year. In addition, the company’s customers can travel to another 254 destinations worldwide in code shares with its partners.

Together with its subsidiary Iberia Express and its franchisee Iberia Regional, it operates a fleet of 134 planes. It has also ordered 27 new long-haul planes, 11 Airbus A330/200 and 16 state-of-the-art A350/900.

It is the leading air carrier between Europe and Latin America, with 250 weekly flights at Madrid airport’s T4 terminal, one of the largest terminals in the world, where it has established its hub. This leadership has been reinforced by the new destinations launched recently, such as Montevideo, Santo Domingo, Havana, Cali and Medellin; by the new Airbus A330 fleet it has already received and that which it is beginning to receive this year; by the new long-haul cabins, both in Tourist and Business class, the latter regarded as the best for connections between Europe and South America according to the renowned Skift platform; and by an exceptional operational performance that makes it one of world’s most punctual airlines (the third most punctual in 2014 among international airlines, with its subsidiary Iberia Express the most punctual among low-cost airlines).

IBERIA has recently renewed its brand image to accompany its business transformation. The new image reflects modernity, freshness and vitality and at the same time remains faithful to its colours and the Spain brand.

It forms part of the AIG Group, the third largest in Europe and the sixth in the world in turnover. It is a member of the oneworld partnership, which provides over 14,000 flights to around a thousand airports in over 150 countries. It is based at Madrid Airport, Latin America’s principal port of entry into Europe and recognised as the Best Airport in the South of Europe by Skytrax, the sector’s most prestigious consultancy.

ELECNOR DEIMOS has developed Europe’s first privately-funded Earth observation satellite (DEIMOS 1) and a second satellite (DEIMOS 2) at its Satellite Design, Integration and Operations Centre in Puertollano (Ciudad Real). It is a pioneer in the commercial use of observation satellites for agriculture, climate change, natural disasters and security.

It has participated actively in all the programmes of the European Space Agency (ESA): Satellite Navigation (EGNOS and Galileo), Science (Gaia,
HISPA SAT’s Amazonas 4 satellite.

Herschel, Planck), Planetary Exploration (Cassini-Huygens, Mars Express, ExoMars, BepiColombo), Earth Observation (Earth Explorers and Copernicus) and Space Environment Monitoring (SSA).

- It was responsible for the design of the trajectory, interplanetary navigation and orbital strategy of the ROSETTA Probe around the Churyumov Gerasimenko comet.

- It is the first private company to develop its own system of observation, surveillance and services for space junk control and alerts for asteroids that could collide with the Earth.

- Similarly, it is responsible for the highest level of Guidance, Navigation and Control system for the IXV vehicle, the ESA’s first atmospheric reentry vehicle.
Naval technology: vessels for the 21st century

Spanish companies are world leaders in the design and construction of customised vessels with in-house cutting-edge technology, together with civil and military naval electronics. They are therefore perfectly adapted to the new defence requirements and the safe maritime transport of special cargoes.

1 > A Spanish company, NAVANTIA, is one of the world’s five leading designers of military vessels. It is present in over 25 countries, particularly Australia, Brazil, Turkey, Saudi Arabia and Algeria, and it participates in major international projects. Its designs for frigates, destroyers and aircraft carriers, which incorporate highly advanced technology with high added value, have won it some major international contracts. Currently, one of the most significant of these is for destroyers and carrier vessels for the Royal Australian Navy.

2 > The Spanish company INDRA, which is highly specialised in advanced systems, radars, electronic defence and communications for submarines, supplies some of the world’s most prestigious navies.

3 > A Spanish company, SENER, designs and manufactures all types of customised vessel thanks to its FORAN software.

This system was created just 50 years ago, which makes it the longest standing software of its type and the most complete in naval construction. It is CAD software for the design, construction and engineering for every type of vessel and maritime artefact.

It creates a complete, detailed 3-D virtual model of the craft from which it is possible to obtain automatically all the information needed for its manufacture and assembly. Up to now, SENER has used FORAN to design over 1,200 vessels of all types. Added to this are an incalculable number of boats and floating structures that SENER’s customers have created from FORAN: vessels of all types, from sailing boats to tugs, including passenger craft, cargo vessels, fishing boats and merchant ships as well as offshore platforms. It has a significant connection to military naval construction through collaborations with the two giants of the sector, BAE Systems in the United Kingdom and NAVANTIA in Spain. It is present in 40 countries and in key global programmes like the following:

- The HMS Queen Elizabeth aircraft carrier for the British Navy. This is the first of the Queen Elizabeth-class and the largest, most powerful surface warship in the history of the British Navy, with the capacity to transport up to 40 aircraft.

- The Successor submarines, also for the British Navy, Europe’s largest engineering project of the past decade.
• The Spring Aeolian bulk carrier by Sanoyas, the world’s biggest in the Panamax class (whose dimensions allow it to pass through the Panama Canal).

• The Leiv Eiriksson dredger, the world’s largest with a capacity of 46,000 cubic metres.

• Also in Russia, it is developing state-of-the-art designs in conjunction with an engineering company from the country. These include the Ekranoplany, which is a cross between a heavy aircraft and a light boat.

• Also in Russia, it is developing state-of-the-art designs in conjunction with an engineering company from the country. These include the Ekranoplany, which is a cross between a heavy aircraft and a light boat.

4 Other Spanish companies also enjoy established positions in this sector. These include INGEMAR, which delivers full, comprehensive solutions on electricity generation, electric propulsion and control for all type of vessels.
State-of-the-art cars and components

Technological leadership and competitiveness in the automotive sector make Spain one of the top vehicle producers and exporters and a favourite location for the principal multinationals to invest and establish themselves. The country’s car component companies supply the most prestigious brands and are among the world’s leaders due to their advanced technology, turnover and extensive internationalisation.

1 > Spain is Europe’s second leading car manufacturer and the eighth in the world. The vehicles made in the country are exported to over 130 countries. Spain has its own automobile brand, SEAT (The Spanish Passenger Car Company). The sports version of the Seat León, the León ST Cupra, is the family car to negotiate Germany’s Nürburgring circuit the fastest.

2 > Spain is also Europe’s leading manufacturer of commercial vehicles.

3 > Four of Europe’s 10 best selling car models are made in Spain.

4 > Spain is one of the world’s few countries to host the majority of the sector’s multinationals, with 17 production plants belonging to nine industrial groups. This is due to its high competitiveness, both in manufacturing and in the components’ sector.

5 > The Spanish component industry ranks sixth in the world and third in Europe in terms of turnover. Component companies occupy leading positions at global and European level and invest heavily in R&D:

- GESTAMP is a world leader in the design, development and manufacturing of components and metalwork for the automobile sector (body components, chassis and mechanisms), mainly from steel, which can account for over 70% of a vehicle. It has 95 production plants in 20 countries in four continents and 12 R&D centres in nine countries, including the main car manufacturing centres. It is in one of the few truly global suppliers in its product range.

- It supplies the world’s top 12 automobile car makers in the world and five of the six leading makers in Europe, with over 79% of production at global level (World Ranking of Manufacturers, OICA) and a total of 25 brand makes. It has become a benchmark supplier thanks to its delivery of global solutions and innovation.

- Its work comprises every process involved in component manufacturing and covers the entire value chain. This makes it a strategic partner for customers.

- It is a world leader in hot stamping (a technique that produces lighter and more resistant steel), with a market share of 30%.
• It has been number one in the world in opening systems and mechanisms since it acquired the Edscha company. It is currently working on passive safety systems for pedestrians.

• The Volkswagen Group has awarded it the prize as one of the year’s 26 best suppliers for its innovative capacity, competence for development, sustainability and professionalism in project management.

The ANTOLÍN GROUP has the capacity to provide all the technology necessary for car interiors. It is now the world’s third leading car interior supplier following the acquisition of the Magna Interiors division from the global automotive supplier, Magna International. It is number one in the world for roof production and is a significant supplier of doors, seats and lighting. Since the integration of the interiors division, it has also provided instrument panels. It has 160 centres in 26 countries in Europe and countries of the North American Free Trade Agreement (NAFTA), the Asia-Pacific Region, Mercosur and Africa.

• One of every four of the world’s cars incorporates ANTOLÍN products.

• One of every three vehicles in the United States uses its products.

• ZANINI is a world leader for wheel trims. It equips one of every five wheels manufactured in the world and is an important supplier for OEM manufacturers in the automobile sector.

• FICOSA is a world leader in the manufacture of rear-view mirrors, for both commercial and industrial vehicles. The company researches, designs, develops, delivers and commercialises solutions for safety, communication and efficiency for cars as well as for medical equipment, consumer electronics systems and the industrial sector. It has factories and technical centres in 18 countries and invests heavily in R&D.

• In 2015, it opened a new state-of-the-art production centre in Cookeville (Tennessee, United States), and a new plant in Shenyang (Liaoning, China).

• FICOSA’s capital and business partnership with Panasonic, signed in June 2015, has created one of the largest international specialised groups. This group is capable of responding immediately to the new needs of automobile manufacturers worldwide and leading the future of the automotive industry at global level. The agreement also signifies a notable display of commitment from a Japanese multinational to a Spanish company.
Key industries, including those mentioned so far, depend on a variety of sectors like machine-tool, steel and new materials. Here too, Spain is in the forefront as a leader in corporate governance, sustainability, innovation and installed production capacity.

09.01. MACHINE-TOOL

The machine-tool sector provides the most important sectors of the economy with the means of production, especially the automotive and component, aeronautical and aerospace, rail and energy production industries.

1 > Spain is the third leading machine-tool manufacturer and exporter in the EU and ninth in the world.

2 > A Spanish company, DANOBATGROUP, part of the MONDRAGÓN Corporation, is a world leader in the manufacturing of machine-tools and the supply of high-tech equipment for rectification of turbine blades in aircraft. It works with virtually all the commercial aircraft companies.

3 > FAGOR ARRASATE, also part of the MONDRAGÓN Corporation, is a world-leading forming machine-tool manufacturer in terms of product portfolio and one of the world’s top three in turnover.

4 > NICOLÁS CORREA S.A. is one of the leading industrial groups in Europe, both in size and in innovation, in the concept, design and manufacture of milling machines. It is a European leader for milling solutions that are adaptable to the most demanding environments, such as the manufacturing of matrices, large format moulds, monolithic aerospace elements and products for the railway, energy and general mechanics sectors.

09.02. STEEL

1 > Spain is 17th in the world ranking of the 63 steel-producing countries of the World Steel Association.

2 > It is third, together with France, for European output.

3 > Approximately 80% of the steel made in Spain comes from recycled material, compared to a 40-50% average in Europe and the world. This enables the Spanish steel industry to save energy and gain efficiency in the use of energy resources.

4 > Spanish steel producers for the construction sector, ARCELORMITTAL GIPUZKOA, COMPAÑÍA ESPAÑOLA DE LAMINACIÓN (CELSA), CELSA ATLANTIC, GLOBAL STEEL WIRE, MEGASA SIDE-RÚRGICA, NERVACERO and SIDERÚRGICA SEVILLA, are the first in the world to adopt a Corporate Social Responsibility strategy (CSR). This is a
Spain is Europe’s third biggest steel producing country, together with France.

Global milestone that testifies to their excellence and thereby maximises their reputation for being pioneers in creating a sustainable management concept in three directions: social, economic and environmental. Internationally, Spain leads the way for having designed its own sustainable management system, one which is tailored to the reality of this type of industry. Its competitiveness is above the legal requirements of any global market. This brand now has companies in Spain, Portugal and Germany.

5  A Spanish company, ACERINOX, is the world leader in terms of installed capacity for stainless steel manufacturing. It is the only manufacturer with four factories on four different continents and it has permanent facilities in over 31 countries.

- It is a leader in the production and sale of stainless steel in the United States. In 2015, the company approved new investments to increase the production capacity of its plant in the United States and provide new finishes and products of added value.

- It is currently building a one million-tonne factory in Malaysia.

- It will supply stainless steel for the longest bridge in China, the largest offshore project in the country’s industrial transport history. The bridge will measure 35.6 Km and unite the regions of Hong Kong, Zhuhai and Macao. The type of steel chosen is designed exclusively for marine environment construction.

6  The only facility in the world to produce state-of-the-art extra-long rails (75m) is found in Asturias, at the plant of ARCELORMITTAL, which forms part of the world’s leading steel-producing industrial group. This was enabled through the development of very sophisticated technology in which many public and private companies and institutions participated.
09.03. GRAPHENE

1 > Spain is eighth in the world ranking of publications in the field of graphene research. Graphene is pure carbon composed of atoms and among its key properties it is estimated to be 200 times more resistant than steel and six times lighter.

2 > ESIC is the world’s third leading institution in graphene research.

3 > Spain produces around 20% of the world’s graphene.

4 > A Spanish company, GRAPHENEA, which uses specialised nanotechnology in the production of high-quality graphene, is one of Europe’s leading manufacturers. It exports to customers from 50 countries like IBM, Philips and Sigma-Aldrich.

► It is a leader in Chemical Vapour Deposition and in Chemical Exfoliation graphene production technology, with a global market share of 10%.

5 > ANTOLÍN GROUP is one of Europe’s pioneering companies in the production of graphene materials at industrial scale.

► It participates in the Graphene Flagship, the European science and technology research project.

► The Spanish company, GRAPHENEA, also participates in this project.

6 > Another Spanish company, GRAPHENANO, has developed a technique for producing graphene in a record time and at lower prices. It has also designed world-unique technology that enables it to manufacture industrial quantities in sheets and cables (km), powdered graphene (tonnes) and graphene in three-dimensional pieces.

09.04. INDUSTRIAL CHEMISTRY

Spain boasts an important chemical sector, with companies holding leading positions in the world:

1 > A Spanish company, CEPSA, is currently the world leader in the sale of surfactants for detergents and has plants in Canada, Brazil and Cadiz (Spain). In Indonesia, CEPSA is building a plant to produce industrial vegetable-based alcohols for biodegradable detergents in a joint venture with the world’s second largest producer of palm oil in Asia.

2 > A Spanish company, MAXAM, is the world’s second largest company and the first in Europe in the sector of civil explosives for mining, infrastructure and quarrying. It operates in more than 48 countries and its products reach over 100.

► It is also the global leader in sport hunting cartridges. It makes over 500 million cartridges a year.

3 > EXPAL, MAXAM’s defence unit, is a European leader in the demilitarisation of obsolete munitions and clearing terrain. It provides defence products and services to the armies of over 30 countries.

4 > Other Spanish companies hold leading positions in the global ranking of chemical product manufacturers. These include CEPSA QUÍMICA, REPSOL QUÍMICA, GRUPO PUIG and FERTIBERIA.

5 > The Tarragona Chemical Cluster is the Mediterranean’s most important logistic, academic and scientific cluster in the field of industrial chemistry.

09.05. ARTIFICIAL CASINGS

1 > Spanish company, VISCOFAN, is a global leader in artificial casings for the meat industry and the only worldwide supplier to develop technologies for all types of casings: cellulosic, collagen, fibre and plastic. Its products are sold in over 120 countries in the world, having been made in their factories in eight different countries in different continents. It continues to expand with new collagen factories in China and Uruguay. It owes its leading position to the high-level technology developed in its production centres.

KEY FACT / Approximately 80% of the steel manufactured in Spain comes from recycled material
Over 60% of the cellulosic casing produced in the world and over 20% of collagen technology comes from VISCOFAN.

2 > ORONA (the MONDRAGÓN Corporation) is a leader in production capacity for complete lift systems in Europe. One in every 10 new lifts is made by ORONA.

It is the number one company in the lift industry worldwide, certified in Eco Design, under ISO 14006.

3 > A Spanish company, ORKLI, which is part of the MONDRAGÓN Corporation, is a world leader in thermoelectric safety systems, magnetic groups and thermocouples.

4 > COPRECI, which is also part of the MONDRAGÓN Corporation, is the leader in gas regulation systems for domestic appliances and its customers include the world’s top white goods manufacturers such as Bosch, Siemens, Electrolux, Miele etc.

5 > The Spanish Mint (FÁBRICA NACIONAL DE LA MONEDA Y TIMBRE) is one of Europe’s six exporting manufacturers of security paper, together with Germany, France, the United Kingdom, Italy and Switzerland. Spain produces approximately 20% of the paper required by the Eurosystem, with impressive quality and high-level technology.

09.06. OTHERS

1 > The MONDRAGÓN Corporation is the world’s largest cooperative industrial group. It possesses a highly international profile and encompasses over 100 small and medium enterprises including DANOBAT, ORBEA, ORONA, ULMA, CIKAUTXO, COPRECI, LKS and URSSA.

Winner of a “Boldness in Business” Financial Times (FT) award in the category of “Drivers of Change”, it is an innovative company for its real business model based on cooperation, collective labour, solidarity and the involvement of people.
10.01. TELECOMMUNICATIONS

A Spanish company, TELEFÓNICA, is one of the world’s largest telecommunications companies in market capitalisation and number of customers. With the support of the best fixed, mobile and broadband networks, together with an innovative offer of digital services, it is today the world’s sixth operator in number of customers and ninth in market capitalisation. With a presence in 21 countries and a client base of 341 million accesses in 2014, it is the world’s largest comprehensive telecommunications company in number of accesses outside its home market. The company has a strong presence in Europe and Latin America and holdings in China Unicom, as well as collaborations with Sunrise, Etisalat and Bouygues Telecom.

- It is the leading operator in the Spanish and Portuguese-speaking markets.
- It is a leading global provider of communication, information and entertainment solutions. Moreover, it provides advanced services in areas such as financial services, e-health, M2M, cloud computing, Big Data, digital video and home entertainment, advertising and security.
- It is Europe’s leading telecommunications company in R&D, with 1.089 billion euros invested in 2014.
- TELEFÓNICA supports entrepreneurs through a variety of programmes. It has created Telefónica OPEN FUTURE, a global, open programme designed to connect entrepreneurs, startups, investors and public and private organisations worldwide. Since its creation, Telefónica OPEN FUTURE has invested with 62 public and private partners over 300 million euros in 500 companies in 17 countries.
- In 2014, it was ranked the world’s 14th best multinational in which to work. This list is created by the Great Place to Work® Institute (GPTW), a prestigious global consultancy that helps companies to become excellent workplaces. Moreover, TELEFÓNICA is the most admired non-American company in the telecommunications sector, according to Fortune magazine.

Spain boasts the top telecommunications operator in the Spanish and Portuguese-speaking world and the benchmark company in delivering advanced technological solutions for the global travel industry. It is the fifth European country in turnover in the ICT sector and a leader in such diverse fields as technology for electoral processes, telecommunications systems, cloud security, or smart cities.
With a high-capacity fibre network of 45,000 km, a presence in over 40 countries, direct access to over 300 international voice destinations, over 7,000 satellite stations and direct connectivity between Latin America, the United States, Europe and Asia, TELEFÓNICA manages the transit of over 20 billion minutes of international voice calls per year and brings the most innovative technology within its customers’ reach.

The SAm-1 cable, owned by TELEFÓNICA, is over 24,000 km long and circles the South American region. The Pacific Caribbean Cable System (PCCS) is an ultra-modern, ultra-fast submarine cable of 6,000 km that considerably improves connectivity throughout Latin America.

10.02. E-GOVERNMENT AND ELECTRONIC IDENTIFICATION TECHNOLOGIES

1 > Spain is one of the most advanced countries in the world in terms of IT usage for digital identification. The Spanish national identity card and electronic passport are two of the world’s most ambitious and pioneering initiatives. They enjoy the participation of the Spanish Mint (FÁBRICA NACIONAL DE MONEDA Y TIMBRE-REAL CASA DE LA MONEDA), and behind them, INDRA and TELEFÓNICA.

2 > The Spanish Mint is a leader in digital signature services and the manufacture of identification documents.
3 > INDRA is a world leader in the development and implantation of electronic identification technologies and biometric solutions.

4 > Spain is also the European leader in the availability of e-administration services (98% of procedures can be undertaken by internet).

► The United Nations has bestowed on Spain the National Public Service Award, the most prestigious international award in public administration, in different editions. This is in recognition of the quality of the internet service the Spanish public administration provides to its citizens.

► A Spanish company, INDRA, boasts over 20 years’ experience in the technological development of solutions for public administrations. It delivers solutions for an integrated e-Government model and Open Government, with over 100 judicial modernisation projects in 13 countries, 10,000 computerised judicial bodies and 45,000 users in Spain’s judicial information systems. It has experience in tax management transformation and innovation, with over 100 million of taxpayers in the systems it manages.

5 > INDRA’s technology in the electoral domain has enabled it to manage some 400 electoral processes in 48 countries, including Spain, France, United Kingdom, Norway, Portugal, United States, Argentina, Colombia and Ecuador, with over 4 billion voters addressed.

10.03. ADVANCED TECHNOLOGICAL SOLUTIONS

Spain is a leader in advanced technologies with companies of recognised global prestige like ABERTIS, AMADEUS, INDRA, PANDA, TE-LEFÓNICA working in a multitude of industries such as defence, telecommunications, energy, financial services, tourism etc. and contributing solutions of high technological value.

1 > AMADEUS is the benchmark company in delivering advanced technological solutions for the global travel industry. Present in 195 countries, it is a world leader in distribution systems in airline reservation transactions processed by travel agencies. AMADEUS is the leader in Europe, the Asia Pacific region, the Middle East and Africa.

► It is one of the world’s leaders in delivering technological solutions for airlines through ALTEA, its technological platform for reservation, inventory and flight departure management.

► It is the leading European company in R&D investment in the travel and tourism sector, according to the EU Industrial R&D Investment Scoreboard compiled by the European Commission. AMADEUS invested 315 million euros in R&D in the past decade, 16.6% of its revenue. It has 18 R&D centres throughout the world, one in Madrid.

2 > TELEFÓNICA is a leading company in M2M technology and has been ranked by Gartner as one of the leaders in its Magic Quadrant for Managed Machine-to-Machine (M2M) Services (October 2014). Its solutions are now being implemented in cities throughout the world. Among them is Smart City, which is based on the FIWARE European standard that includes management services for traffic, lighting, irrigation, local policing, waste and the environment.

► TELEFÓNICA also provides M2M connectivity to Tesla electric vehicles in the principal European markets. The solution powers Tesla’s Model S telematics and info-entertainment services and is supplied by TELEFÓNICA and its M2M World Alliance partners.

3 > Europe’s most important data centre, in terms of data security, is located in Spain. This is the Alcalá Data Center owned by TELEFÓNICA. It enjoys the TIER IV Gold certification that guarantees the site’s operational sustainability and the high level of its technical infrastructure.

4 > A Spanish company, PANDA SECURITY, is the global leader in cloud protection security solutions and the top company in embracing the concept of cloud security. The antimalware laboratory Pandalabs has developed an award-winning and internationally acclaimed collective intelligence system.

► It is the creator of the first cloud protection antivirus in history. This is the Panda Cloud Antivirus.
It is the first manufacturer to propose a disruptive focus based on Cloud Computing, Big Data and Behaviour Analysis, from which Panda Adaptive Defense has resulted.

It is the leading company in the Visionaries Quadrant (according to Gartner’s Magic Quadrant for Endpoint Protection Solutions report). It is the first manufacturer of platforms for endpoint protection to show full commitment to the development of cloud-based security services. It has subsidiaries in European and American countries.

The ADVANTIS software commercialised by the Spanish company SERVIREDEL is a multi-application operating system based on international standards for EMV chip technology. It combines EMV credit/debit applications and an electronic purse with other non-financial applications such as transportation, digital signature, authentication, etc. It is a leader in the Latin American market as the most used system, with over 900 million cards issued with this technology.

Technology from the Spanish company BRAINSTORM, which provides real time 3D graphic solutions for all broadcasters, is behind the largest Video Wall graphics in the world. These are at Nasdaq and are connected in real time to the technology stock market in Times Square (New York). Communications giants like Reuters, CNBC and BBC use the company’s software to develop their visuals and it also lends its services to major sporting events like Wimbledon.

A Spanish company, D.A.S. AUDIO, is a leading designer and manufacturer of sound reinforcement systems and is at the forefront of sound technology. Its equipment is recognised worldwide for its quality and power, with its products found at locations where first-rate reliability and sound quality are required.

Its products provide the sound for some of the world’s most prestigious venues: American Airlines Arena (United States), Minsk Arena (Belarus), Twickenham Stadium (United Kingdom), Saxe Theater (United States), Souk Okaz Theatre (Sau-
di Arabia), I Beam Club (Malaysia), Muse Club (Singapore), Kirchner Cultural Centre (Argentina), Gran Canaria Arena (Spain), Hotel Tropicana (Las Vegas, United States) to cite a few examples.

For live events, its products accompany famous artists and personalities at the top concerts, festivals and occasions around the world. These include: the Superbowl (United States), Glastonbury Festival (United Kingdom), Shenzhen Satellite (China), ADAC Supercross (Germany), the Alejandro Sanz Tour (Latin America and Spain), FIB Benicassim International Festival (Spain), NH7 Weekender (India) and Ultra Music Festival (United States).

It has also helped United States President Barack Obama to get his word across.

8 A Spanish company, NEXT LIMIT TECHNOLOGIES, which develops software created by two Spanish engineers, has devised “Realflow”. This is the first software to provide movies with special effects related to liquid (a tsunami, a giant wave, lava etc.). It is the world’s leading company in the movie industry’s visual effects market and its effects have been used in over 100 movies. The company won an Oscar at the 80th edition.
Ground-breaking science at the service of health

Spain has one of the world’s best universal health systems, both in terms of its management and its development of advanced technological solutions. Spanish companies are at the forefront of biotechnology, pharmacy and applied medical research, with the country being the global leader in organ transplants and donations over the past 23 years.

11.01. HEALTH SYSTEM

1 > Spain has one of the world’s best universal health systems, both in terms of management and administration, and its pioneering implantation and development of advanced technological solutions, such as electronic prescriptions and digital medical records. Spain has an integrated health system, with an extensive network of university, public and private hospitals and research centres.

2 > Spain ranks fifth in the world in health technology exports. It is also the fifth-ranked country in Europe for the number of clinical tests it performs.

3 > The Spanish model of health management and digitalization is in the global vanguard. INDRA, TELEFÓNICA, OESIA and EVERIS are leading companies in Europe and the world. Spanish companies develop important projects in this sphere in a host of different countries.

4 > TELEFÓNICA, through its Saluspot network, enables patients to engage in personalised teleconsultations with doctors. This project is widely implemented in Latin America. Moreover, TELEFÓNICA has introduced a personalised system that provides patients with remote healthcare, both when they are at home or travelling.

5 > INDRA’s healthcare information systems incorporate solutions for hospital information systems, electronic medical history and electronic prescription in different countries, such as Brazil, Chile, Mexico, Bahrain and the Philippines.

11.02. BIOTECHNOLOGY AND PHARMACY

This is a sector with huge growth potential and a high degree of R&D+I. Spain occupies first place in Europe and third in the world in agro-biotechnology and fifth in biochemistry and molecular biology. Spain is also present in highly specialised and strategic sectors, such as the production of essential plasma-derived drugs. It is the Eurozone’s fifth leading country in scientific production and the 10th worldwide. According to the British Royal Society, 2.5% of scientific publications in this field are produced in Spain.
One of the world’s leading companies in the production of biological plasma-derived drugs is Spanish, GRIFOLS:

- It is number one in the world for its capacity to obtain plasma.
- It is also a leader in transfusion medicine with its blood typing product line, NAT technology and antigen production for immunoessay reagents. It has become the only company to deliver comprehensive solutions for blood and plasma donation centres, aimed at controlling the entire process: from blood donation to transfusion. Its activity completes the offer of medicinal products for hospital use.
- It ranks third place in the world for sales volume and fractionation capability and is the number one company in Europe in its sector. Regarding products, the proteins intravenous immunoglobulin (IVIG), serum albumin, Factor VIII and alpha 1-antitrypsin are the biggest sellers.
- With these proteins being essential for treating different diseases, GRIFOLS is researching their application for treating other diseases such as Alzheimer’s, based on the extraction of patient plasma and its replacement, mainly with albumin. The firm is also present in biotechnology projects through the participation in companies such as PROGÉNIKA BIOPHARMA, ARACLON BIOTECH and NANTHERAPIX.

Another Spanish company, PHARMAMAR, from the ZELTIA group, is the world leader in development of innovative drugs of marine origin for treating cancer. It uses a comprehensive business model and has a sales network throughout Europe, with subsidiaries in Spain, Italy, Germany and the United States.

- It is among the most innovative groups in the world, according to Forbes.
- It is the first company in the world to market an anti-tumour treatment derived from the sea.
Now on the market, Yondelis is the first marine-based pharmaceutical product to have been approved by the European Medicines Agency (EMA). Other products are between development stages I and III.

According to figures from the Spanish Biotechnology Association (ASEBIO) it is the most active private company in terms of intellectual property and has a large patent portfolio.

A Spanish company, GENÓMICA, which belongs to the ZELTIA group, is a leader in molecular diagnosis using low-density arrays. Its unique, versatile technology enables a wide range of applications from clinical microbiology to oncology. It is present in over 30 countries.

It is also a leading company in technology transfer projects for genetic identification and criminalistics laboratories.

A Spanish company, GMV, is developing the world’s first and only intraoperative radiotherapy planning system, the result of many years’ R&D in computer simulation techniques and medical image processing. The system is being used by prestigious hospitals nationally and internationally.

Other Spanish companies like LIFELENGTH, ORYZON, PLEBIOTIC, ALPHASHIO and TECNALIA hold important positions in the field of biotechnology and genetic R&D.

LIFELENGTH is the world’s first company to deliver telomere length measurement services as indicators of the body’s biological age and state of health.

ORYZON is an international leader in epigenetics, which studies the interaction between genes and environment that occurs in living organisms. It develops experimental drugs in the area of oncology and degenerative diseases. It has opened a centre in Cambridge (Massachusetts), the United States’ epigenetics’ capital, in order to boost its development on the other side of the Atlantic and foster activity in this key field of biotechnology, in which it is now a leader in Europe.

It heads the Eurostarts project for the research of leukemia therapies and it is a partner in Mind, which researches the development and application of new technologies for the treatment of Alzheimer’s disease and other related forms of dementia. It develops innovative medicines for Huntington’s Disease as part of the Dendria Consortium. It also participates in five projects on new therapies for Parkinson’s Disease, pharmaceutical developments for haematologic cancers and for treatment of rare neurometabolic diseases.

PLEBIOTIC has developed a pioneering molecular simulation model that has enabled drugs to be designed in a record time without the need for a lengthy trial process.

ALPHASHIP is a bionanotechnology company that focuses on the design and production of diagnosis chips, which facilitate the detection of biomarkers and other substances. They are also applied to road safety by enabling detection of drugs and other substances. The company boasts recent achievements in the field of microelectronics and health. It is the only Spanish company to have entered a pilot line for the manufacture of semiconductors sponsored by the 27 EU countries, the Commission and industry in the Ecsel Joint Technology Initiative. It has also participated very actively in creating the Masria strategy with Ms. Neelie Kroes so that Europe can be competitive in high technology.

TECNALIA has developed a surgical robot with 3-D vision and tactile sensations. It also heads a European project for an app that provides each journey with a better alternative and gives the elderly clear, simple information. The participants are Citruna Technologies OY (Finland), E-Seniors (France), Transport & Travel Research Ltd (United Kingdom), the University of Vienna (Austria), VTT Technical Research Centre of Finland (Finland) and IN2 as a subcontractor (United Kingdom). The final application is expected to be ready in 2015, when public bodies like town and country councils, together with private bodies, will be able to incorporate it into their normal services.

BIOKIT stands out as a pioneering company in biotechnology, relying heavily on R&D+i.

TELEFÓNICA has implemented a system that provides patients with remote healthcare, both when they are at home and when they are travelling. It can be personalised.

The National Oncological Research Centre is the world’s number one in percentage of specialised scientific publications and their impact.
11.03. TRANSPLANTS

Spain has been the world’s leader in organ donations and transplants for 23 consecutive years, with an all-time high of 2,678 transplant patients and with records in kidney and heart transplants. It has a management model that is unique in the world:

1 > Spain has the highest organ donation rate of any country in the world. Donations are made altruistically, with a rate of 36 donors per million inhabitants in 2014 (1,682 donors), nearly doubling that of the EU and topping the United States. It accounts for 17% of European Union donations.

2 > The Spanish transplant management model developed by the National Organization of Transplants (ONT) is considered internationally to be a benchmark. Starting to be implemented in a large part of the world, it is an extremely innovative and efficient management system for the communication and transfer of necessary organs to the most appropriate medical centre. The Spanish model comprises a set of measures taken in our country to improve the management of organ donations. This model has been covered extensively in scientific literature and recommended by the WHO (World Health Organization). It is being implemented in different parts of the world with similar results as those obtained here. With the involvement of the entire Spanish health system, the ONT also creates training events for professionals from different countries, especially those of Latin America, to implement the Spanish transplant model there.

3 > The WHO declared Spain to be the headquarters of the Global Observatory on Donation and Transplantation in 2006 and in 2008 named the ONT as a WHO Collaborating Centre.

4 > Spanish expert José Ramón Núñez has been appointed Head of the WHO Transplants Division with Rafael Matesanz, Director of the ONT, as its chief advisor. These appointments confirm the excellence of the Spanish transplants system, which has promoted organ transplants throughout the world in accordance to the ethical principles of the Spanish system.

5 > The world’s first simultaneous bilateral leg transplant in the world and the second transplant of two entire arms were performed by Spanish surgeon, PEDRO CAVADAS.

11.04. MEDICAL RESEARCH

1 > Spain is the world’s third leading country in assisted reproduction. The Valencia Infertility Institute (IVI) is a global leader, with 23 centres in seven countries. It is one of the most decorated in the reproductive field, with eight awards granted by the American Society for Reproductive Medicine.

- It has the best results for pregnancy rates per patient.
- It runs the largest ova and semen donation programme.
- It has produced the largest number of scientific publications about its specialty.

2 > The world’s number one cancer research centre in percentage of scientific publications and their impact is Spanish: the CENTRO NACIONAL DE INVESTIGACIONES ONCOLÓGICAS, (National Centre for Oncology Research or CNIO). It ranks among the top 10 biomedical research centres in the world, according to figures from SCImago. It is second in Europe, trailing only Israel’s Westman Institute. It is fifth in the world, placed among the Salk Institute of San Diego and Cold Spring Harbour of Long Island, the cradles of modern molecular biology for their scientific production in the journals with the greatest impact.

3 > The CARLOS III NATIONAL CENTRE OF CARDIOVASCULAR RESEARCH (CNIC) is a European benchmark. This is thanks to the work of a team of experts headed by Valentín Fuster, who combines his position with duties at Mount Sinai Medical Center in New York. Other internationally renowned Spaniards like Vicente Andrés García and Borja Ibañez Cabeza participate in this project, together with 400 scientific leaders in different disciplines and 13 of the top Spanish companies.
4 > Spanish neuroscientist Rafael Yuste, the coordinator of the Kavly Institute of the University of Columbia, is directing the BRAIN (Brain Research through Advancing Innovative Neurotechnologies) Project, the most complete neuron map for exploring the human brain, which aims to combat diseases like Alzheimer’s, Parkinson’s Disease, autism and epilepsy. The US will initially invest 100 million dollars in the Project.

5 > In ophthalmic optics, Spanish company INDO is a leader in progressive correction lenses and equipment supplies for optometrists and ophthalmologists. The OFTALMOLOGÍA BARRAQUER Centre in Barcelona and the INSTITUTO FERNÁN-DEZ-VEGA in Oviedo are leaders in the ophthalmology sector.

6 > Research to develop the first malaria vaccine has been headed by Spanish specialist PEDRO ALONSO of the Barcelona Centre for International Health Research (CRESIB).

7 > The first therapeutic and preventive vaccine for Alzheimer’s disease has been presented by a Spanish team of researchers headed by Dr. Ramón Cacabelos. Its efficacy has already been proven in genetically altered mice and it will soon be tested in humans.

8 > A group of Spanish scientists from the Hospital Clínic in Barcelona are in charge of the development of a therapeutic vaccine against HIV.

9 > Many other Spanish scientists, working in Spain and abroad, are in charge of medical research projects: the aforementioned Spanish cardiologist Valentín Fuster, Director of the Cardiovascular Institute at Mount Sinai Medical Center and the CARLOS III NATIONAL CENTRE OF CARDIOVASCULAR RESEARCH (CNIC), is a world-renowned expert in his field. In addition, Josep Domingo Domenech and Carlos Cordón, who have just discovered a mechanism for attacking tumour stem cells. Psychiatrist and researcher Luis Rojas Marcos is another internationally recognised figure for his work in the field of psychiatry. He was Director of the Municipal Hospital Psychiatry System in New York from 1982 to 1992 and Head of the Mental Health, Alcoholism and Drug Addition...
Services until 1995, when he was appointed President of the System of Health and Public Hospitals in New York. This service encompassed the city’s 16 public hospitals and outpatient network and he remained in the post until 2002. Others that are globally recognised include distinguished oncologists María Blasco and Joan Massagué.
12

Finance, insurance and other services: solidity and innovative formulas for enterprise and progress

Spain has two of the world’s largest, most efficient, best-managed and most digitalised banks, which are regarded as benchmarks by the sector’s principal international publications. Moreover, it boasts the benchmark insurance company in Latin America and one of the best in Europe, together with leading-edge companies in private security, security software and cybersecurity.

12.01. FINANCE AND INSURANCE

Two of the world’s most important financial entities are Spanish: BANCO SANTANDER and BBVA. They are also the principal financial franchises in Latin America. The Spanish banking industry is the leader in digital technology in Europe.

1. BANCO SANTANDER is the number one Eurozone bank in market capitalisation and among the 12 largest in the world. It is the international bank with the highest number of branches on the planet, as well as the leading brand for commercial banking and the world’s sixth most important financial brand, according to The Banker. It is also one of the world’s most efficient banks. Euromoney Magazine has rated it as the Best Bank in the World and the Best in the UK, Poland, Portugal, Mexico and Argentina.

- It is one of the main commercial banking franchises in the United Kingdom, with a network of over 900 branches that provides a panoply of services to 25 million customers.

- It is Chile’s leading bank by asset volume and number of customers and it is the largest private bank in Argentina. It is third in private banking in Brazil (and its leading foreign bank) and Mexico’s third largest financial group by turnover. It is also the third largest bank in Portugal and Poland.

- It is Germany’s leader in consumer financing.

- It has been selected as the Best Bank in the World four times in the past decade by the prestigious financial publications, Euromoney and The Banker. Moreover, it was rated by the Financial Times as the Most Sustainable Bank in the World in 2013 and the Bloomberg Markets journal has placed it first in the annual list of the Greenest Bank in the World on three out of four possible occasions.

- BANCO SANTANDER places particular focus within its sustainability policy on supporting higher education worldwide. It has collaboration agreements with 1,175 universities in Europe, America, Asia and Africa.

2. BBVA also ranks very favourably in international terms and maintains a strong position in Latin America. It is one of the European leaders in the
transformation of the financial industry into a digital and knowledge banking model, as recognised by Euromoney in 2014. It is the only major bank with a leading technological platform capable of operating in real time.

It is the largest financial institution (BBVA Bancomer) in Mexico to have been selected as Mexico’s Best Bank by the Global Finance journal.

It has also been rated “Best Bank in Latin America 2015” by Global Finance as a result of its significant presence in Peru, Colombia, Chile, Argentina, Uruguay, Paraguay and Venezuela.

It is also the leading global entity of the Pacific Alliance (Mexico, Colombia, Peru and Chile), an area equivalent to the sixth largest economy in the world.

Part of the BBVA group since July 2015, Garanti is Turkey’s largest bank by market capitalisation. It has over 13 million customers and a marked technological superiority.

BBVA Asset Management has been rated as Best Manager in Spain, Portugal, Chile and Colombia in the European Funds Trophy 2015 awarded by Morningstar.

It was ranked the Best Global Retail Bank 2015 by the journal Global Finance.

The BBVA Microfinance Foundation is the philanthropic private initiative with the greatest social impact in Latin America.

The United Nations has granted BBVA the Social Investment Pioneer award in the category of social business. This is for its contribution to the development of communities in which it is present through the Microfinance Foundation.

These two Spanish banks dominate the Latin American banking system.

The number one life insurance group in Latin America and the second global operator in the region is the Spanish company, MAPFRE. It is also the sixth most important European non-life insurance group and is amongst the United States’ top twenty in car insurance. It is one of the world’s largest groups for reinsurance and assistance.

It is among the world’s top 15 reinsurers.

It is the third assistance insurer.

12.02. OTHER SERVICES

Spanish company PROSEGUR is one of the world’s leading multinationals in the private security sector. Number one in Latin America, it is also a key player in Europe and is growing sharply in Asia.

Spain is the third largest security software producer after the United States and Israel. Its products embrace all the areas of cybersecurity of globally-established companies such as INDRA, S2IS, ECM, PANDA SECURITY, ICA etc.

The Spanish company, INDRA, is among the five European companies with the greatest activity and presence in international R&D initiatives in the cybersecurity.
Spain boasts the all-time most successful combination of the business model and fashion, one which is studied with wonder and admiration worldwide. It also has companies that are leaders in bridal fashion, high-street fashion and jeans manufacturing technology.

The history of Spanish fashion has been sprinkled with some creative geniuses who have left their mark on the world, such as Mariano Fortuny and Cristóbal Balenciaga. With their lineal cuts and treatment of fabric and colour, they turned the world of haute couture on its head. Their influence is still present today and universally acclaimed by the greatest designers of the day. Spain also has some remarkable designers currently working and triumphing on international catwalks.

1 > The world’s largest fashion distribution group, which has a unique product strategy that is the object of study in the best business schools, is Spanish and called INDITEX. Its business model applied to fashion is the most patent example of global success in its sector. The group operates through over 6,000 stores in 88 countries worldwide and online sales. It continues its global expansion.

   ▶ It is among the world’s 50 largest distribution groups.
   ▶ It is among the world’s 100 most innovative groups, according to Forbes.
   ▶ It is sixth in Europe in terms of stock market value.

   ▶ The group’s most emblematic shops, with over 2,500 sq. m of retail space and located in the most fashionable locations in global capitals, include the store on East Wanjung Rd in Shanghai, Zara’s flagship store on London’s Oxford Street and another in Beijing’s Xidan Joy City. At the end of the year, it will open a global flagship store of over 4,000 sq. m in New York’s SoHo district.

2 > PRONOVIAS is a Spanish company that is number one in the world’s bridal industry. It has clients in 93 countries and exclusive boutiques in 31.

3 > Other Spanish companies and groups are well-placed in the global ranking. These include MANGO, which has over 2,700 points of sale in 108 countries and enjoys a very strong position. Another is the CORTEFIEL GROUP, which comprises four chains with their own brand and is present in 84 countries through 2,054 points of sale.

4 > The Spanish company, JEANOLOGÍA, has revolutionised the jeans industry. Using innovative methods, it is a market leader in sustainable technological solutions for the textile industry, leather, footwear and other industrial applications.

   ▶ Its laser, ozone and e-flow systems have revolutionised the textile industry by providing endless
possibilities for garment design and finish, while making savings in water, energy and chemicals. Moreover, the use of these techniques enables automation of the finishing processes and the development of a sustainable production that reduces costs and increases productivity in the textile industry.

► 25% of global jeans production (6 billion) currently uses JEANOLOGIA technology.

► It has customers across the globe and the export of its machines and services represents 90% of its turnover, with its products internationalised in 45 countries.
A variety of Spanish companies distinguish themselves in different fields in this sector:

1 > A Spanish company, ROCA, is number one in bathroom and sanitary ware manufacturing. It is present in over 130 countries in four continents.

2 > Spanish company PORCELANOSA is the global leader in the ceramic floor and wall tiles sector. It has over 400 sales outlets throughout the world, both through its own-brand stores and through outside business concerns and local distributors.

3 > The world leader in quartz surfaces is a Spanish company, SILESTONE, which belongs to COSENTINO GROUP. It produces and distributes high-value innovative surfaces for the world of architecture and design. This is enabled by pioneering and leading brands in their respective segments like “Silestone®”, “Dekton®” or “Sensa®”, which create unique atmospheres and designs for the home and public spaces.

4 > GRUPO FIGUERAS is the world’s leading company in the public seating sector, with 10 million seats installed in the world showcasing a high level of innovation and technology.

- The world-unique Mutaflex system automatically converts an area used as a conference hall, theatre or auditorium into an open space. When a button is pressed, moveable seats travel along rails and are stored under a stage, which is also mobile. Over 300 projects use this system over the world.

- The company is present in 130 countries and eight showrooms and has over 40,000 installations worldwide: the White House Press Room in Washington DC, Room XX of the UN in Geneva, Switzerland, the Philippines Parliament, the Paris Philharmonic etc.

The world’s leading companies in bathroom and sanitary ware, ceramic floor and wall tiles, quartz surfaces and public seating are Spanish

The group’s development is based on international expansion, an innovative R&D programme, respect for the environment and sustainability, a permanent corporate commitment to society and the local communities in which it is present, training, equality and health and safety at work.
Architecture: fascinating past, creative present and promising future

A rich historical heritage, architects who are passionate about technical innovations and conceptual daring, unprecedented internationalisation and a shower of accolades and awards combine to make Spain a global focus of architectural innovation and excellence.

1 > Spain is a benchmark in world architecture. This is due to its architectural gems, which are representative of the country’s rich cultural past. However, it is also down to the achievements of its present-day architects, whose creations set trends across the globe and whose projects offer solutions for the cities of the future.

2 > Spain is the country with the third highest number of sites included in the UNESCO World Heritage List. These include 15 cities whose architectural, artistic and cultural worth is a gift to humanity. While each of them has its own singular features, all are lucky enough to offer artistic and architectural jewels of great value to inhabitants and visitors alike.

3 > In accordance with the rich architectural tradition over its time-honoured history, Spain is nowadays a top-notch country for architecture. It has become an international hub for architectural innovation and excellence in the early years of the 21st century. The interest shown by Spanish cities in avant-garde architecture as a symbol of modernity and progress began with the opening in 1997 of Bilbao’s Guggenheim Museum, which was designed by the Canadian architect Frank Gehry. Soon afterwards, the City of the Arts and Sciences (1998) opened its doors in Valencia, followed by the Kursaal Congress Centre and Auditorium in San Sebastian (1999).

Since then, Spain has played host to the construction of some of the world’s most outstanding buildings, which have won the sector’s most prestigious prizes.

4 > In just 10 years, the most renowned Spanish and international architects have bequeathed to our country a series of emblematic buildings that have entered into the history of world architecture for their technical innovations and conceptual daring. The flowering of avant-garde projects with innovative architectural solutions since the late 1990s has been such that in 2006 New York’s Museum of Modern Art (MoMA) devoted an exhibition to new Spanish architecture and defined us as a country that has become an international centre for architectural innovation and excellence.

5 > In April 2007, León’s MUSAC (Museum of Contemporary Art of Castilla y León), designed by architects Emilio Tuñón and Luis M. Mansilla, received the European Union’s Mies van der Rohe Award for Contemporary Architecture. The Award had already been won in 2001 by Rafael Moneo’s Kursaal in San Sebastian. Moneo was also the first Spanish architect to receive the Pritzker Architecture Prize. This came in 1996, the year when the renowned architect and university professor also received the Gold Medal of the International Union of Architects (UIA). Among his most valued works are the Museum of Roman Art in Mérida (1985),
the Concert Auditorium in Barcelona (1999), the Museum of Modern Art in Stockholm (1998), the Kursaal Congress Centre in San Sebastián (1999), and the extension to the Prado Museum in Madrid (2007).

**6** > Terminal T-4 of Adolfo Suárez Madrid-Barajas Airport caused a stir when it was opened in 2006. Designed by the British architect Richard Rogers together with Spaniards Antonio Lamela and Luis Vidal, the terminal is famous for its great undulating vault sustained by colourful poles. The building received the Stirling Architecture Prize, the most important for architecture in the United Kingdom. Since its inauguration, it has obtained other numerous awards from European and international institutions; including the IStructurE Award for Commercial or Retail Structures 2006, from the Institution of Structural Engineers, and the International Architecture Awards 2007, granted by the Chicago Athenaeum. It also achieved third place in the World Airport Award in 2013.

**7** > Due to their great quality, technique and perseverance, Spanish architects have left their mark on countries like France, China, Germany, Belgium, the United Kingdom, Japan and Switzerland, as well as on the Arab world. Their projects form part of the lives of many citizens in the world: they have provided them with hospitals, libraries, bridges, museums, churches and shopping centres, among many other great works.

**8** > Below are some of the architects, awards and projects that have set trends for their combination of avant-garde technique and design:

► Santiago Calatrava’s work is characterised by its impressive and innovative structures. He has offices in New York, Doha and Zurich, where he has designed projects like the Turning Torso skyscraper (Malmö, Sweden), the West Railway Station (Lisbon, Portugal), the Olympic Sports Complex in Athens (Greece), Liège Railway Station (Belgium) and the Tabourettli Theatre (Basle, Switzerland). In 2003, Calatrava won the contest to build the transport hub at the World Trade Center in New York, in the area now known as Ground Zero.
The Herreros Arquitectos studio was responsible for the International Conventions Centre in Bogota. It came into prominence in 2009, by winning an international contest to build the museum dedicated to the Norwegian expressionist painter Edvard Munch in Oslo. To do so, it competed against another twenty studios, including such significant architects as Zaha Hadid or David Chipperfield.

The Geneva and Munich bridges are the work of Francisco Burgos and Ginés Garrido.

The Telcel Theatre in Mexico resulted from the plans of Antón García Abril. A benchmark in the performing arts, it combines design, technology, comfort and sustainability.

The design of Envés Arquitectos, the company formed by Alberto Velarde, Miguel Ángel Velarde and Miguel Ángel Navas, triumphed over 2,000 proposals to build Berlin’s Central Library.

The Sánchez-Horneros architecture study is responsible for the design of Panama’s hospital complex.

The Galician architect César Portela has worked with some of the big names in international architecture, such as Aldo Rossi and Arata Isozak.

José Selgás and Lucía Cano, the creators of the Congress Centre in Cartagena and the Bada-joz auditorium, were the first Spanish architects to design the emblematic summer pavilion for the Serpentine Gallery in London’s Hyde Park, commissioned to mark the 15th anniversary of its creation and opened in June 2015. Drawing together architectural, furnishing and accessory design, this space’s annual inauguration is one of the biggest events of the London spring and early summer. It is now one of the world’s top 10 attractions in the field of architecture and design due to the numbers of visitors who attend to view the architectural and artistic structure. The Serpentine Pavilion has gathered the most iconic and visual pieces by Daniel Libeskind, Toyo Ito, Oscar Niemeyer, Rem Koolhaas and Frank Gehry.

Luis Vidal, the director of architecture of the aforementioned T-4 of Barajas, “humanises” major airport spaces. He is also the creator of one of the world’s most emblematic infrastructure works for its monumentality and originality and because it involves one of the busiest airports in the world: Heathrow Airport’s new Terminal T2A in London. Heathrow is currently the world’s largest in the number of international flights and the third for passengers. Building work for the terminal was carried out by HETCo, a joint venture comprising FERROVIAL AGROMAN and Laing O’Rourke. This
terminal, which welcomes over 20 million passengers a year, responds to a more humanised airport model. It helps passengers find their way more intuitively and stands out for its commitment and responsibility to the environment, thanks to a design that achieves a 40% reduction in CO2 emissions. Conceived as a tribute to early aircraft, its emblem is a textile roof that fills the space below with natural light. Named “The Queen’s Terminal,” it opened on 4 June 2014.

Also in London, the professors of the Higher Technical School of Architecture of Madrid (ETSAM), Luis Fernández-Galiano and Alberto Campo Baeza, were distinguished in 2014 as International Fellows of the Royal Institute of British Architects (RIBA). Another Spaniard, Lluís Hortet, is an honorary member.

In Amsterdam, Antonio Cruz and Antonio Ortiz have remodelled the Rijksmuseum. These two architects from Seville have brought this emblematic neo-Gothic building museum in line with the 21st century.

The success of their projects encouraged the ACERO ARQUITECTOS (Joaquín Torres and Rafael Llamazares) studio to expand their work to Dubai and the Dominican Republic.

Renowned for their single-family luxury homes, AMP ARQUITECTOS (Felipe Artengo and José María Rodríguez-Pastrana) achieved international recognition when their work was displayed at the MoMA in New York during an exhibition on current architecture in Spain. For their part, EMBT Arquitectos (Enric Miralles and Benedetta Tagliabue) have designed many important works in the world, including the Scottish Parliament Building in Edinburgh (2004).

In the Arab world, our architects are in high demand and lead a variety of major projects. The exhibition entitled “On a journey. Spanish architecture in the Arab world”, has been seen in Palestine, Kuwait, Egypt and Qatar. It includes projects by studios and architects like Nieto Sobejano, Fenwick Iribarren (a global benchmark in sports architecture), César Ruiz Larrea, Rafael de La Hoz, Campo Baeza and AV62, the studio that won the competition to design the National Museum of Afghanistan, in which the Great Mosque of Cordoba inspired the proposal by Victoria Garriga and Toño Foraster. Its project was chosen from 72 entries from 31 countries. For his part, Guillermo Vázquez Consuegra has been commissioned to design the Medina museum complex (Saudi Arabia). Jorge Gil Martínez and Rafael Lorente Santamaría created “The King’s Tower” project in Manama (Bahrain) and the Lamela studio of Antonio and Carlos Lamela designed the Sohar Bank headquarters in Muscat (Oman).

Together with the Terminal 4 of Barajas airport, the Lamela studio has undertaken other major national and international projects such as Real Madrid’s sports complex and the Krakow Stadium (Poland).

There are Spanish architects who have moved to other countries and started architecture firms there. This is the case of Madrid-born Alejandro Zaera, who is based in London where he founded the FOA studio (Foreign Office Architects) with Farshid Moussavi. Among their innovative projects is the Yokohama Passenger Terminal (Japan, 2000-2002), which is regarded as an architectural benchmark.

Rafael Lozano-Hemmer is an electronic artist who creates interactive installations that cross the frontier between architecture and performance art. His main interest lies in creating platforms for public participation by altering technological tools like robotics, computerised surveillance and telematics networks. He is the coauthor of the VIDA International Art and Artificial Life Competition. His installations have been viewed at events like the Millennium celebrations in Mexico City (1999), the European Capital of Culture in Rotterdam (2001), the UN global summit in Lyon (2003), the inauguration of the YCAM museum in Japan (2003), the 50th Anniversary of the Guggenheim Museum in New York (2009) and the Winter Olympics in Vancouver (2010).

Spain is one of the world’s leading countries in museology. Architect Juan Pablo Rodríguez Frade’s participation in the remodelling projects for the country’s numerous museums has helped this discipline to flourish, the result of his combination of originality, excellence and avant-garde solutions that highlight the objects in each exhibition.

The expansion of Spanish architecture in the world is unstoppable. To help keep track of...
the sector’s achievements, the website “Spanish Architecture” of Spain’s Higher Council of Architects’ Colleges features the principal projects that Spanish talent is creating abroad.

**10 ➔** Those who are born in the coming decades will live longer lives. This will require modifications to many aspects of the urban environment.

- A total of 12 Spanish companies participate in Live 100 Years, an initiative that seeks to prepare the cities of the future to accommodate inhabitants of over 100 years old. This is an international project aimed at responding to the medium-term research and business opportunities on the horizon due to citizens’ increased life expectancy.

- The projects submitted include technological solutions like Augmented Reality applied to senior citizen tourism, interactivity and connectivity in the home, drone-assisted mobility and tools for storing urban memory.

- The companies participating in the project are GRISVERD-ALAZOR, ALBERTA NORWEG 2.0, ARQUIMEA, BARCELONA GLOBAL DESIGN, ECUS SLEEP, ENDESA, ENTERTAINMENT SOLUTIONS, INDRA, ISECO SISTEMAS, OPTICAL ILLUSIONS DESIGNS, ROCA and SISTEMAS DE DATOS.
A publishing industry on a global scale

The number of titles published, the variety of genres, the active presence in international fairs and the standing of the country’s literary prizes make Spain one of the world’s top publishing powerhouses.

1 > With almost 80,000 new titles published each year, Spain boasts the fourth largest publishing sector in the world after the US, United Kingdom and Germany. Our country possesses very strong publishing houses in the sector, with subsidiaries in 32 countries, 80% of them in Latin America.

2 > PLANETA is the sixth-largest publishing group in the world, the largest in Spanish language publishing and the second-largest in French. Moreover, the Planeta literary prize, bestowed every 15 October, is one of the world’s most valuable, behind only the Nobel Prize in Literature, with 601,000 € for the winner and 150,250 € for the runner-up. Its far-reaching international scope is enhanced by the plentiful participation of Latin American writers and by the global dissemination obtained by the translations of the winning novels into other languages. The PLANETA GROUP owns EDICIONES DESTINO, which since 1944 has awarded the Nadal Prize to the best unpublished novel. It is Spain’s oldest literary prize. The writers who have won the Nadal Prize include important figures in Spanish and Latin American literature of the 20th century. The winner currently receives 18,000 € and the Prize is awarded every 6 January. PLANETA is also a world leader in the publication of fascicules.

3 > The SANTILLANA GROUP leads the non-university educational publishing subsector in Latin America and enjoys a large presence in the US. For its part, the SM GROUP heads the subsector of children’s and young people’s books in Latin America and the OCEANO GROUP is the world leader in the subsector of Spanish reference works in Latin America and the United States.

4 > Antonio Muñoz Molina won the LIBER Prize for the best Spanish and Hispanic author at the LIBER 2014 book fair, which is promoted by the Spanish Publishers’ Association (FGEE) and held in Barcelona.

5 > Spanish publishing houses are present in Latin America in the form of 156 subsidiaries in the region.

Mexico leads demand, followed by Argentina, where over 4 million books have been exported at a value of 10 million euros. Spanish publishers and authors are ever-presents at the country’s quintessential publishing event, the Buenos Aires International Book Fair. Rosa Montero, Arturo Pérez Reverte and Javier Cercas have attended, together with the main Spanish publishing houses, in this great celebration of Spanish-speaking literature. Every year, the event draws over a million readers and more than 12,000 professionals from the world of publishing.

Colombia, which imports almost 2.5 million copies, in another of the most important destinations for Spanish writing. Its capital holds a
famous, long-standing literary competition, the Bogotá International Book Fair (FILBo). Its 28th edition, held on 21 April-4 Abril, attracted a host of Spanish authors, such as the writers Antonio Ventura, Ana Griott, the young poet Elvira Sastre and internationally-renowned illustrators like Carme Solé, Emilio Urberuaga and Javier Olivares.

Latin America confirmed its importance for the Spanish publishing industry in 2014. The sharing of a language opens up a very large market that brings not only financial benefits but also cultural enrichment.

If the Latin America is crucial for Spain, the European market is equally so. France, Italy and Portugal lead the Spanish publishing sector’s sales in the continent. In fourth place is the United Kingdom, which recently hosted Spanish authors and publishers at the London Book Fair, one of the major spring events for the European sector together with the Paris, Bologna and Turin fairs.

For its part, the Spanish institution, Casa Árabe, was present for the first time at the International Book Fair at the Abu Dhabi National Exhibition Centre, held on 7-13 May. Its stand received numerous visits from the local public and Spanish expatriates who are very interested in all aspects of Spanish culture.

In summary, Spain has again been very active at International Book Fairs, not only those in Bogotá and Buenos Aires, but also throughout the world, with the London event providing an outstanding example. Twenty Spanish publishers and literary agencies, together with some of the country’s most famous writers, have travelled to these events to present their new works.

One of the most important characteristics of the Spanish publishing sector is its openness to other cultures, which is key factor to its international success. Spain is the EU country with most titles translated into other languages (27%), followed by Germany.

One of the most important characteristics of the Spanish publishing sector is its openness to other cultures, which is key factor to its international success. Spain is the EU country with most titles translated into other languages (27%), followed by Germany.

Spain also possesses some core assets:

- The National Library is among the world’s top three.
- Spain has one of the world’s best archiving systems. It is a pioneer in archive modernisation and coordinates the major European project, APEnet, which digitalises documentary materials.
- It possesses the only historical archive to be declared a World Heritage site by UNESCO. This is the General Archive of the Indies in Seville.
Rather more than cinema and television: the creative innovation of a country that is really in the picture

The Spanish audiovisual sector is thriving, as demonstrated by the international interest aroused by its film and TV production. For the cinematic tradition and devotion of its people, its singular locations and atmospheres, the diversity of its experiences and cultural variety, Spain is truly a country that is really in the picture.

1. Original Cinema that Connects with Every Class and Culture

1 > The talent and creativity of Spaniards is etched into the history of cinema. We are the world’s eighth country in number of movies produced and Europe’s fourth.

2 > The filmmaker Luis Buñuel, the genius from the small town of Calanda, was a pioneer, collaborator and maestro to many other creative talents born in Spain. Directors like José Luis García Berlanga, Fernando Rey, Paco Rabal, Carlos Saura, Jesús Franco, Isabel Coixet, Julio Medem, Alex de la Iglesia and Pedro Almodóvar have displayed the Spanish character in the four corners of the globe.

3 > Six Spaniards have received Oscars, with Gil Parrondo and Pedro Almodóvar having won two each. Our industry has also been distinguished with four Oscars for Best Foreign Movie: “Begin the Beguine”, directed by José Luis Garci (1982); “Belle Époque” by Fernando Trueba (1993); “All About My Mother”, directed by Pedro Almodovar (1999) and “The Sea Inside” by Alejandro Amenábar (2004).

4 > Other international box-office hits include ‘The Impossible’, by J.A. Bayona, ‘Sex and Lucia’ by Julio Medem, ‘The Others’ by Alejandro Amenábar, Pedro Almodóvar’s ‘Volver’, as well as the series, ‘REC’ by Jaume Balagueró and ‘Torrente’ by Santiago Segura.

5 > An growing number of Spanish directors give their productions an international bent. This is now not only down to their foreign success at the boxoffice but also to their international teams. Star names who have worked in Spanish productions include Nicole Kidman, Gary Oldman, Viggo Mortensen, Ewan McGregor, Naomi Watts, Christian Bale etc.

6 > Spain and its landscapes also form the backdrop to many foreign films: “Vicky Cristina Barcelona”, “Kingdom of Heaven”, “Star Wars II: Attack of the Clones”, “The Tourist”, “The Bourne Ultimatum” and “Exodus”, to name a few recent examples.

7 > Spanish cinema is increasingly welcomed by the international market, with export revenues...
close to 200 million euros. In the United States sales are 6.5 million euros a year, while the figure for Latin America is about 10.5 million. J.A. Bayona’s “The impossible” continues to enjoy success in China, where it has made 48 million dollars and become the world’s most lucrative Spanish film, with revenues of 220 million dollars. In second place is Alejandro Amenábar’s “The Others”, with over 210 million dollars.

8 > The desire to recognise Spanish cinema led to the creation of the Goya Awards in 1987 and many festivals are also devoted to the work of the country’s filmmakers. The most important are, without doubt, the San Sebastian International Film Festival and the Valladolid International Film Festival at which annual awards are bestowed on international works. However, there are other established festivals like the Gijón Film Festival, Documenta Madrid, the Málaga Film Festival, the Punto de Vista Festival, the Catalonia International Film Festival, the Seville European Film Festival and the Málaga Spanish and Latin American Film Festival.

17.02. SPANISH TELEVISION: THE EMERGENCE OF INNOVATIVE PRODUCTION

1 > In the past decade, the Spanish TV industry has taken off in impressive fashion and really caught the eye. Spain now finds itself among the five most important countries in the marketing of fiction formats. This is confirmed by “The WIT Guide to Scripted Formats 2014”, the first international study on the marketing and production of fiction formats.

2 > TV consultancy firm “The WIT”, which produced the report, has recognised that Spanish fiction is one of the most sought after for adaptation in other countries. It showed as much at the International TV Programme Market (MIPTV) in Cannes, the world’s biggest audiovisual exhibition; and at the trade fair of the National Association of Television Program Executives of America (NATPE) of the United States.

3 > The creativity and quality of Spanish TV production has conquered the international market. One only needs to look at the large number of series sold by Spain’s production companies, either for broadcast in other countries or for adaptation.

4 > The list of Spanish series that have conquered the international market is a long one. The most recent hits are “Los misterios de Laura” y “Pulseras Rojas”, which have been adapted for broadcast by two important US networks, NBC and Fox, as “The Mysteries of Laura” and “Red Band Society” respectively. This is the first time that Spanish series have been adapted for major networks in the United States. It has also been announced that CW and FOX will air remakes of “El Barco” and “Los Serrano” respectively.

5 > One of Spain’s most successful fiction series, “Águila Roja”, is broadcast in over 20 countries and has achieved high ratings: the United States, Mexico, Bulgaria, South Korea, Thailand etc. “Isabel” is shown in Honduras, Peru, Nicaragua, Bolivia, Costa Rica, El Salvador, Guatemala, Ecuador, the Dominican Republic and Paraguay. “Gran Hotel” has been sold to 30 countries, including the United Kingdom, Germany, France, Italy, the United States, Canada, Iran, Lithuania etc. “El Barco” has reached the publics of over 40 countries and Russia has created its own version of the series. “El Internado” has not only been a smash hit with young people in Spain but has also been enjoyed in Latin America and Eastern Europe. Other highly successful Spanish fiction productions are: “Cuéntame”, “El Tiempo Entre Costuras”, “Velvet”, “El Secreto de Puente Viejo”, “Aída”, “Física o química”, “Gran Reserva” etc.

6 > International TV channels have also shown interest in entertainment programmes like “El Hormiguero”, whose version is shown in China, Portugal, Chile and Brazil; and “Tu cara me suena”, adapted in over 20 countries in Europe, Asia and the American continent, including the United States.

7 > Spanish TV production has also received international recognition in the form of important awards. “El Hormiguero” has been nominated twice for the International Emmy Award for Best Non-Scripted Entertainment. “Isabel” obtained the ACE Award 2013 bestowed by the Association of Entertainment Critics of New York. “El Internado” won the MipTV Award in Cannes as one of the best formats in TV history.
The most international Spanish production companies include the GLOBOMEDIA GROUP, which in recent years has very successfully exported series like “Águila Roja”, “El Barco”, “Los Serrano” and “El Internado”. BOOMERANG TV has made international market sales with fiction series such as “Los misterios de Laura”, “El tiempo entre costuras” and “El Secreto de Puente Viejo”. DIAGONAL TV has taken its historical production “Isabel” to a variety of Latin American countries. BAMBÚ PRODUCCIONES has achieved global success with the series “Gran Hotel” and “Velvet”, while FILMAX INTERNATIONAL has done the same with “Pulseras Rojas”.

The global projection of Spanish production companies and communication groups is also reflected in their participation in international productions.

This is the case of ATRESMEDIA, which co-finances with the BBC the science fiction series, “Refugiados”, which is produced by BAMBÚ. Meanwhile, Spanish companies VERALIA CONTENIDOS AUDIOVISUALES and MAD MEX have signed a partnership with the Mexican production company Argos Comunicación to launch transatlantic TV projects.

“The impossible” by Juan Antonio Bayona, is Spain’s biggest ever box-office hit.
A unique agrifood sector: technology, innovation, capacity and quality

Spain possesses nearly all the different climates on Earth and a great variety of soils. Added to this are advanced cultivation techniques, product quality, transformative innovation, production capacity and emblematic brands that make the country the top producer and exporter of oil, wine and other products and a home to leading companies in a globally renowned sector.

The food sector as a whole represents 9% of GDP, behind only the tourism sector (10.3%). It stands out for its innovations, which create a sector with a capacity, development, R&D&I and quality that is of international renown.

1 > Spain is the world’s top producer and exporter of olive oil.

2 > Spain leads the world in the production and marketing of table olives.

3 > It boasts the world’s largest vineyard by area and is the third wine biggest producer and exporter, behind only France and Italy.

4 > Spain is the world’s second exporter of fruit and vegetables, behind the United States and ahead of the Netherlands.

5 > Spain is the world’s second producer of almonds, trailing only the United States.

6 > Spain is the EU’s second largest pork producer and the world’s fourth.

7 > Spain is the country in the Mediterranean region with the largest surface area of greenhouses, followed by Italy. It is the world’s leader in the technology devoted to these crops.

8 > It is the top EU country in terms of the surface area it devotes to organic production.

9 > Spanish agrifood companies are present worldwide in different sectors:

- A Spanish company, DEOLEO, leads the world in the marketing of olive oil – with brands like CARBONELL, KOIPE and HOJIBLANCA. It is present in approximately 150 countries across the globe and its brands lead markets throughout the world e.g. Italy, United States, Canada, Brazil and Australia.

- CARBONELL enjoys the biggest sales in the world of all Spanish olive oil brands and holds leading positions in the Netherlands, Brazil, Ecuador, South Africa and Australia.

- The world’s largest oil distributor is Spanish company BORGES, which is a leader in over 25 countries.

- Another Spanish company from the same sector, LA ESPAÑOLA, is a leader in over 20 countries.
BORGES is also one of the world’s five most important operators in the sale of walnuts.

The FREIXENET GROUP is the world’s top company in the sector of quality sparkling wines and is a leader in the cava sector. It is present in over 130 countries and has subsidiaries in Germany, United States, United Kingdom, Japan, Canada, Australia, France, Mexico, Russia, Italy, Portugal, Argentina, Poland, Sweden and Switzerland. The Group also has another 17 companies that produce cava and wine.

MIGUEL TORRES was the world’s most admired wine brand in 2014 and 2015, according to the ranking of the British magazine Drinks International in which 200 wine professionals from around the world took part. It is one of the leading names in the wine and brandy market, with wineries in Chile and California and a presence in 150 countries.

GONZALEZ BYASS is the world’s sixth Family of Wines in the ranking of the 100 Top Wineries of 2014, compiled by the WAWWJ (World Association of Writers and Journalists of Wines and Spirits). As well as spreading the culture of sherry globally, over 30 years ago González Byass incorporated wineries from emblematic areas such as Bodegas Beronia –in Ollauri, La Rioja-, Cavas Vilarnau –in Sant Sadurní d’Anoia, Barcelona-, Finca Constancia – in Otero, Toledo-, Finca Moncloa –in Arcos de la Frontera, Cádiz- and Viñas del Vero –in el Somontano, Barbastro.

OSBORNE is a global leader in Brandy de Jerez and also enjoys a distinguished position in the sherry and Rioja wine sector. Its main international brands are Carlos I Brandy and Bodegas Montecillo (D.O. Rioja). It stands out in the food sector for Cinco Jotas Acorn-Fed 100% Ibérico Ham. The company is known around the world for the iconic Osborne Bull, which is also exploited internationally through licences.

The world’s number one rice and number two pasta producer is a Spanish company, EBRO PULEVA.

BODEGAS TORRES’s Finca Mas La Plana was the world’s most admired wine brand in 2014 and 2015.
• It designs and develops tools for ensuring animal and plant health, both in production and in exports and consumption. Traceability and border control systems designed by GRUPO TRAGSA are today at the forefront of a sector of huge sensitivity and growing importance.
Culinary variety and innovation, embodied in the Mediterranean diet and the talents of its chefs, the high number of blue flags on its beaches, the existence of numerous, varied natural spaces, the diversity and standing of its museums, the rich cultural heritage, the exciting traditions and the high level of security provide a unique combination that makes Spain a global tourism powerhouse.

Tourism is a priority sector for the Spanish economy. It represents around 11% of GDP and covers 174% of its balance of trade deficit. In 2014, it welcomed a record 65 million tourists, with the number expected to rise in 2015.

1 > Spain is the favourite tourist destination for Europeans, the world’s number one holiday destination, the world’s third most visited country and the third most popular destination for international meetings. Two Spanish cities, Barcelona and Madrid, appear in the Top 100 Cities Destination Ranking, according to Euromonitor 2013.

2 > It is the second leading country in tourism revenue, only bettered by the United States and ahead of France, Italy, China, and Germany. Furthermore, Spain is the world leader in the Tourism Balance Ranking (tourism revenue and costs).

3 > Spain is the world’s most competitive country for tourism, according to the Biannual Report on Tourism and Competitiveness compiled by the World Economic Forum (WEF). This report takes into account a wide range of variables, such as the national legislation, environmental sustainability, security, infrastructures and cultural resources of 140 countries.

4 > Spain leads international development of the new Smart Tourist Destination model, which revolves around innovation, technology, sustainability and accessibility. This is a model that responds to the needs of the economy and the digital traveller and is being exported to other countries.

5 > It is the world’s second-placed brand name in the tourism sector, surpassed only by the United States, according to the annual classification compiled by Bloom Consulting.

6 > It is among the countries with the highest tourist satisfaction levels. A total of 82% of tourists who visit Spain return and 40.3% of tourists have visited Spain 10 or more times in their lives.

7 > Spain is Europe’s leading retirement destination.

8 > Boasting a total of 44, Spain is the country with the third highest number of World Heritage Sites, according to UNESCO. It trails only Italy and China.
9 > It is the country with the second highest number of protected natural spaces declared as Biosphere Reserves by UNESCO. With a total of 45, it is behind only the United States.

10 > CASTELLET CASTLE, the headquarters of the ABERTIS FOUNDATION, is the home of a UNESCO CENTRE FOR MEDITERRANEAN ECOSYSTEM BIOSPHERE RESERVES for the study of the Mediterranean region. It is located in a unique biodiversity-rich location and it possesses the ISO 14.001 certification that guarantees proper environmental management. The Centre’s two main aims are:

   ▶ The creation of documentary resources on sustainability in natural spaces and sustainability indicators.

   ▶ The development of a database within the framework of North-South cooperation. This will use the collection of publications about international cooperation with regard to the Mediterranean Region’s biosphere reserves and National Parks.

11 > Spain is the European country with the second largest surface area dedicated to protected natural spaces, it has 15 National Parks, 126 Natural Parks and over 2000 km of Greenways for hiking.

12 > Europe’s largest ecological reserve, the DONANA NATIONAL PARK, is located in Spain. Spain is also the European country with the second largest surface area devoted to protected natural spaces.

13 > A Spanish company, TRAGSA, is a leader in conservation and enhancement of National Heritage and Biodiversity, both in marine and land ecosystems.

14 > Spain heads the list of 33 countries that participate in the Blue Flag Beach programme, with 568. There are also 101 marinas with blue flag status.

15 > Spain has one of the world’s finest museum networks. The quality of its collections makes THE PRADO MUSEUM one of the world’s most outstanding art galleries. It receives over 2.5 million visitors every year. Other Spanish museums are also among the most important, such as the REINA SOFÍA MUSEUM, the GUGGENHEIM, the PICASSO MUSEUM and the DALÍ MUSEUM.

16 > The CAMINO DE SANTIAGO, the route to Santiago de Compostela taken by pilgrims from around the world, has been declared the First European Cultural Itinerary and a UNESCO World Heritage Site.

17 > Spain is the third-placed European country in volume of air passengers, behind the United Kingdom and Germany (Eurostat). Three Spanish airports, Adolfo Suarez-Madrid-Barajas, Barcelona and Palma de Mallorca are among the top 15 busiest airports in Europe. Madrid-Barajas occupies fourth place.

18 > Spain is the world’s third leading country in hotel capacity.

19 > Five Spanish companies are among the world’s top 30 most important hotel groups: MELIA HOTELIERS is the world’s leading holiday hotel chain, located in 35 countries and with over 350 hotels. The Asia-Pacific region is one of its most recent areas of new activity. Well-placed in the global ranking, NH HOTEL GROUP is Spain’s leading urban hotel chain and one of the largest in Europe and Latin America. BARCELÓ HOTELS & RESORTS is Spain’s third hotel chain and the 35th largest in the world, with 107 urban and holiday four and five-star hotels in 19 countries. RIU and FIESTA HOTEL GROUPS also occupy significant positions at global level.

20 > In 2010, UNESCO declared the Mediterranean diet, which is specific to Spain, to be an Intangible Cultural Heritage of Humanity. The health benefits of this diet and its role in the prevention of chronic illnesses are scientifically proven.

21 > Spain is the European country with the second highest number of heritage sites named as an Intangible Cultural Heritage of Humanity. It has 14.

22 > Spain is placed 27th in the countries with the highest quality of life in the world, according to the 2014 United Nations Human Development Index.

23 > Spain is the fifth-ranked country in number of Michelin Stars, behind France, Japan, Germany
Spain is one of the few countries with a culinary university, the Basque Culinary Centre in San Sebastian. It includes an R&D&I centre managed by all Spain’s most prestigious chefs who hold Michelin Stars.

- Ferrán Adrià is judged to be the world’s best chef of the past decade.

- EL CELLER DE CAN ROCA (Girona) was declared the world’s best restaurant in 2015, according to the British culinary magazine “Restaurant”. It also won in 2013.

- Spain has three restaurants in the world’s top 10 (EL CELLER DE CAN ROCA, MUGARITZ and ARZAK) and five among the top 50.

- ELENA ARZAK was chosen as the Veuve Clicquot World’s Best Female Chef in 2012, according to the British culinary magazine “Restaurant”.

Thousands of flamingos in the marshlands of Doñana, Europe’s largest ecological reserve.
Spain is acknowledged as a great sporting power as a result of its successes on the field of play, its management and its sports industry. It has the world’s top football league and one of the best national sides. Added to this is the country’s leadership in tennis, basketball, motor racing, cycling and swimming, among other sports.

20.01. INTERNATIONAL SUCCESSES

1 > The Spanish national football team is the first in the world to win three successive major titles: the European Championship in 2008, the World Cup in 2010 and the European Championship again in 2012. Spanish footballers are internationally renowned: Iker Casillas, Andrés Iniesta, Sergio Ramos, Xabi Alonso, Fernando Torres, David Villa, Cesc Fábregas, Carles Puyol, David Silva, Xavi Hernández, Gerard Piqué, Jordi Alba, Sergio Busquets and Álvaro Arbeloa, etc.

2 > Among 23 of the most outstanding players selected by UEFA at the 2012 European Championship, 10 were Spanish. Competitions involving the top Spanish teams attract great interest from fans around the globe. A large international public follows the Spanish football league, which is considered to be the world’s best.

3 > Vicente del Bosque is the second international football manager to achieve the double of the World Cup and European Championship (2010-2012), after the German, Helmut Schoen (1972-1974). Del Bosque received the FIFA Golden Ball award as the best coach of 2012.

4 > According to the Forbes list, REAL MADRID C.F. is the world’s most valuable football club, with an estimated worth of 3.3 billion USD. It is the first time that Real Madrid has surpassed Manchester United, which had held the top position since Forbes created this list in 2004. United is now in second place. F.C. BARCELONA is in third place with an estimated value of 2.6 billion USD, having recorded the highest growth among the clubs analysed by Forbes.

5 > REAL MADRID C.F. and F.C. BARCELONA are the football clubs with the highest annual earnings in the world, according to the Football Money League report compiled by Deloitte. REAL MADRID C.F. heads the ranking and has passed the 500 million euro barrier for the first time.

6 > F.C. BARCELONA and REAL MADRID C.F. are first and third in the number of European football titles won (15 and 12 respectively). REAL MADRID is the team with the most European titles in football and basketball, with 10 Champions Leagues and eight Euroleagues. BARCELONA, with four Champions Leagues and two Euroleagues, is also outstanding at handball with eight European titles and at roller hockey with 19 European cups.
Five Spanish teams are playing in Europe’s top football competition, the Champions League, in the 2015-16 season. This is the first time a country has had five representatives. They are: Real Madrid, Barcelona, Atlético Madrid, Seville and Valencia. Spanish clubs have dominated European competitions over the past 15 years, winning 23 Champions League, Europa League and European Supercup titles.

Spanish football’s supremacy in Europe was further emphasised by the epic European Supercup match between Barcelona and Seville on 11 August 2015. Not only did it pair the Champions League and Europa League winners, who are both Spanish, but two of Europe’s finest exponents of the game, providing evidence of its excellence in Spain. Spanish clubs have won six of the past seven European Supercups and a total of 12, shared between Barcelona (5), Atlético Madrid (2), Valencia (2), Real Madrid (2) and Seville (1).

In men’s basketball, the Spanish national team is considered the world’s second best by FIBA, after the United States. They were world champions in 2006, they won a silver medal in the Olympic Games of 1984, 2008 and 2012, they were European champions in 2009, 2011 and 2015, and finished third in the World Championship of 2013. For their part, the Spanish female under-18 side were European champions in 2015, repeating the gold they won in 2013 and winning their 10th overall medal since 2004. This confirms their domination of the category in Europe. Moreover, the Spanish women’s senior team enjoyed the best position in its history when they won the silver medal in the World Cup in Turkey in 2014 after an unforgettable final against the best women’s basketball team of all time: the United States.

In men’s handball, Spain were world champions in 2005 and 2013, and also won a bronze medal in 2014. The women’s team obtained the silver medal in the 2014 European Championships.

In swimming, Mireia Belmonte is world and European champion. She also won two silver medals at the 2012 London Olympics. Her haul at the European championships in Berlin in 2014 was six medals, two in each colour. This took Belmonte’s career total to 10 medals in senior continental competitions. She crowned her brilliant performances in 2014 by winning two golds and three...
silvers at the Short Course World Cup in Moscow. For her part, the Paralympic swimmer Teresa Perales has won numerous medals at the Olympic Games in Sydney, Athens, Beijing and London. Her total of 22 medals, six of which were gold, has led her to be compared with Michael Phelps.

12 > In tennis, the Spanish team has won the Davis Cup five times (2000, 2004, 2008, 2009 and 2011). Spain’s Rafael Nadal, is the only player in the world to have won the French Open seven times and is considered the best clay-court specialist of all time. Carlos Moyá and Juan Carlos Ferrero have also held first place in the world ranking. In addition, Garbiñe Muguruza was a semifinalist at Wimbledon in 2015.

13 > In motor racing, Fernando Alonso was the world Formula 1 champion in 2005 and 2006 and runner-up in 2010 and 2012. In rallying, Spanish driver Carlos Sainz was world champion in 1990 and 1992, FIA World Rally cross champion in 2007 and winner of the 2010 Dakar Rally.

14 > In Grand Prix motorcycle racing, Spain has been world champion on 38 occasions since Ángel Nieto won the first of his 13 world titles in 1969. Nieto remains the second most successful rider in history in terms of titles gained. In rallies, Marc Coma celebrated three outstanding victories in the Paris Dakar Rally (2006, 2009 and 2011) as did Nani Roma in 2004. On three occasions, all the titles in the same season of the MotoGP World Championship have been won by Spanish riders, a feat no other country has achieved:

- 2010: MotoGP (Jorge Lorenzo), Moto2 (Toni Elías) and 125cc (Marc Márquez).
- 2013: MotoGP (Marc Márquez), Moto2 (Pol Espargaró) and Moto3 (Maverick Viñales).
- 2014: MotoGP (Marc Márquez), Moto2 (Esteve «Tito» Rabat) and Moto3 (Álex Márquez).
- 2015: MotoGP (Jorge Lorenzo).

15 > Spain is a leading force in the world of cycling. Miguel Indurain is the only cyclist to have won the Tour de France on five consecutive occasions (1991-1995) and Alberto Contador is the most recent of only five cyclists to have won all three major tours: Tour de France, Giro d’Italia and Vuelta a España.

16 > In athletics, Miguel Ángel López, who won a bronze medal in the 20 km walk at the 2013 World Championships and a gold at the most recent European Championships in Zurich, was proclaimed world champion in 2015. For her part, high jumper Ruth Beitia won a bronze medal at the 2015 World
Indoor Championships and a gold at the 2015 European Championships.

17 > In badminton, Carolina Marín from the Spanish city of Huelva was proclaimed World Champion in 2014 and 2015, ending Asian domination of the sport.

18 > In waterpolo, the Spanish women’s national team won the silver medal at the 2012 London Olympics and gold at the World Championships in 2013 and 2014. The men’s team was Olympic champion in 1996 and world champion in 1998 and 2001.

19 > In figure skating, Javier Fernández, the European triple champion, was proclaimed world champion in Shanghai in 2015.

20 > Spain is one of Europe’s top countries in karate. It finished first in the medal table at the 2015 European Championships in Istanbul. The country is also a global benchmark in the sport: it won the 2014 World Championships in Bremen, with Spaniard Damián Quintero taking the gold medal. For her part, Sandra Sánchez is European champion and also won the European Games. Rocío Sánchez won the bronze medal at the 2014 World Championships while Matías Gómez and Cristina Vizcaíno won bronze at the 2015 European Championships.

21 > In rhythmic gymnastics, Spain were world champions in 2014 in the five clubs event.

22 > In 2014, Spain’s women golfers lifted the International Crown, an event considered the sport’s official world championships.

23 > In sailing, Marina Albalau won the silver medal at the 2014 World Championships.

24 > In mountaineering, Juanito Oiarzabal, boasts the world record after climbing 26 eight-thousander summits. Edurne Pasaban took female climbing to its greatest glory by becoming the first woman to climb the 14 eight-thousander peaks. At the age of 76, Carlos Soria became the oldest person to climb Kanchenjunga.

25 > In other sports, Spain has also been the world champion in futsal, roller hockey, triathlon, synchronised swimming, and Olympic shooting.

Other world-renowned Spanish sportsmen and women include, in golf (Sergio García and previously Severiano Ballesteros and José María Olazábal), sailing (Iker Martínez, Xabi Fernández, Támara Echegoyen), canoeing (David Cal) etc.

20.02. SPORTS MANAGEMENT

1 > Spain deservedly enjoys a privileged place among the world’s sporting elite, mainly thanks to its decisive commitment to an exclusive model of sports management and organisation. This involves the Administration, federations and clubs looking to the grass roots to train young talents and foster good practices.

2 > Spain’s extensive network of stadiums, sports centres, Olympic swimming pools and other multi-disciplinary venues make it one of the best places to play sport. The country has also taken advantage of its topography and privileged climate to create first-rate infrastructures devoted to the practice of aquatic, winter and mountain sports as well as golf.

20.03. SPORTS INDUSTRY

1 > INESPORT (Spanish Technology Platform for the Sports Industry) groups Spanish world-leading companies dedicated to sports material manufacturing and management activities for sports facilities.

2 > Spain has one of the world’s best producers of high-tech artificial turf, FIELDTURF POLIGRAS. It is a global leader in sporting and special flooring solutions and is responsible, among other projects, for the facilities at Moscow’s Luzhniki Stadium.

3 > MONDO IBÉRICA is one of the world’s top companies in the production of sports surfaces and equipment and boasts its own R&D department. It was founded over 25 years ago when chosen to be an official supplier for the Barcelona Olympic Games. With head offices in Zaragoza, it is today the centre of design, research and...
production of sports equipment, wooden flooring, seating, stands, sports electronics and artificial turf for the worldwide Mondo Group. The plant located in Borja (Zaragoza) opened in 2002 and manufactures artificial turf for a variety of sports and for decorative use. Its products are present at the top international sports events, including World and European Championships in basketball, futsal, paddle tennis and athletics. It has also been an official supplier at each of the past 10 Olympic Games.

4 > FLUIDRA is the world’s leading producer of swimming pool equipment (due to its climate, Spain represents over 50% of Europe’s swimming pool market). MSL (in partnership with ATHOS) was responsible for electronic time keeping and packaging at the 2012 London Olympics.

5 > TECNOLOGÍA DEPORTIVA S.A. manufactures high-tenacity, recyclable polypropylene knotless netting under the brand EL LEÓN DE ORO, which is a global benchmark of quality. It has offices in the United Kingdom, United Arab Emirates and Hungary (serving Eastern Europe) and has commercial and distribution agreements with New Zealand, Australia, Malaysia, the United States, Chile, Brazil, Peru and Uruguay. Its nets were used at the 1992 Barcelona Olympics, the 2009 Confederations Cup in South Africa, the 2010 World Cup in South Africa, the 2013 Confederations Cup in Brazil, the 2014 World Cup in Brazil, the 2015 Asian Cup in Australia and the 2015 Copa America in Chile.

Rafa Nadal, who has won the French Tennis Open seven times, is the regarded as the best clay court specialist of all time.
Spain provides not only some of the world’s finest business schools but also a large number of senior executives in the leading multinational companies.

Spain has some of the most internationally renowned business schools. IE BUSINESS SCHOOL, ESADE BUSINESS AND LAW SCHOOL, IESE BUSINESS SCHOOL, EADA BUSINESS SCHOOL and ESIC are the benchmarks of an executive training system that is both admired and imitated. Every year, it attracts to Spain those students who are called to hold positions of leadership in their spheres and countries from around the world. Not for nothing, Spain is the country with the second highest number of business schools in the world. Three of the above, IE BUSINESS SCHOOL, ESADE and IESE, are among the top 25 institutions in the principal rankings in this field.

1 > Spain is the country with the highest number of business schools in Europe’s top 10, according to the Financial Times’s (FT) list of European Business Schools 2014. Third, fourth and sixth places are held by IE BUSINESS SCHOOL, ESADE and IESE respectively, while EADA is in 24th place. To create the ranking, the FT assessed the degree of internationalisation of business schools, the international reach of their programmes, the progression of graduates with regard to their profession and salary, the degree of diversity of the staff and in the classrooms and the level of compliance with the expectations of students and client companies.

2 > According to the FT ranking, Spain is also the only country with two business schools, IESE and ESADE, among the world’s five best for their open, customised senior management programmes. IESE is the only business management school to offer training in four continents (Europe, Asia, America and Africa).

3 > In its customised management training programmes, IESE rose to take first place in the Executive Education ranking published by the FT on 18 May 2015. This underlines both the internationalisation of its programmes and participants and the quality and diversity of its staff. The FT highlights programme design, which is increasingly interactive, adapted and oriented to student participation. IESE has designed customised programmes for Oracle, the European Network of Transmission System Operators, Airbus, L’Oreal, Santander, BBVA, Telefónica and Danone, among others.

4 > With regard to full-time MBA Programmes, Spain has three business schools among the top 20 in the world, according to the FT annual ranking in January 2015. There are only three other countries, apart from the United States, among these 20: the United Kingdom, France and China, which each have two. IESE is seventh, IE BUSINESS SCHOOL 12th and ESADE BUSINESS SCHOOL 19th. According to the ranking of The Economist in 2014, the most recent available, the IESE is fifth (ahead of Harvard and Berkeley).

5 > Spanish business schools are also globally renowned for other masters’ programmes, according to the FT. IE is the second best business school for its Master’s Degree in Finance in the
“pre-experience” modality, according to the FT’s Masters in Finance Pre-experience 2012 ranking. IE is the sixth best school in the world and ESADE the seventh for their Master’s Degree in Management, according to the FT’s Masters in Management 2012.

6 > ESADE is the second best school in the world for teamwork (MBA Rankings: Top Schools for Teamwork) and the fourth best in the world for diversity (MBA Rankings: Top Schools for Diversity); IESE is the sixth best school in the world for ethics (MBA Rankings: Top Schools for Ethics); and IE ranks ninth in the world in entrepreneurship (MBA Rankings: Top Schools for Entrepreneurship) and the 10th best in the world for leadership (MBA Rankings: Top Schools for Leadership), according to the Business Week rankings published in December 2012 and January 2013.

7 > Spain is the third European destination (after the UK and France) and eighth in the world (after the US, UK, France, Canada, India, Singapore and Hong Kong) for candidates from around the world seeking to take a master’s course, according to the Graduate Management Admissions Council (GMAC). The Council holds the international exam taken by candidates for admission to the world’s best schools, the Graduate Management Admission Test (GMAT).

8 > The MONDRAGÓN CORPORATION has created an academic and business management model, allied to the demand for qualified personnel in companies, which is based on employability solutions. It is among the world’s top seven best professional training operators chosen by the Kingdom of Saudi Arabia to manage 10 Colleges of Excellence following a rigorous selection process with over 40 candidates from around the world.
Foreign investment has been a major contributor to Spain’s development. Numerous foreign multinational companies have established global production centres and a significant number of centres of excellence in Spain due to the major development of these sectors, their highly qualified workforce and their technological centres.

Foreign-owned companies provide around 1.25 million jobs. The proportion of jobs with foreign subsidiaries in the industrial, commercial and service sectors is 20.9%, 11.1%, and 9.6%, respectively, of the total number of workers in each.

Moreover, 40% of Spain’s total international sales corresponds to foreign companies or their subsidiaries.

The number of innovative companies with foreign capital represents 25% of the total number of companies with over 250 employees in Spain. Expenditure on R&D by foreign companies represents a third of total spending on R&D in the business sector. Spain is the EU country with the third highest number of R&D centres belonging to multinational companies.

22.01. infrastructure, rail and high speed

The high level of development of Spain’s rail and high-speed industry is reflected in the decision by foreign multinational companies to establish their global production centres and centres of excellence in the country.

1 > Canada’s Bombardier Transportation is the leading global manufacturer of trains and the third for planes. It invests strongly in R&D&I. At the cutting edge of global aeronautical and rail technology, the company chose Spain, where it has over 800 employees, for its new Centre of Excellence in Railway Signalling Engineering, located in San Sebastian de los Reyes (Madrid). The Centre has some 250 employees and over 90 years’ experience in the development of railway signalling technology. It has grown to the point where it now leads international teams in markets from North Africa to Latin America.

2 > The Production Plant for Propulsion in Trapaga, Vizcaya, which is considered to be in the leading group of Bombardier Transportation’s top plants in the world, is the second best plant and the first Centre of Excellence in Quality and Continuous Improvement (according to the BOS...
Audit). It heads projects for Spain, Portugal, Italy and Latin America.

3 > Bombardier Services in Spain has also been selected as a global centre for the development and production of a system that measures electrical energy consumption by railway vehicles. The Systems Division is a global Centre of Excellence in the implementation of driverless operation systems, based on the experience of the automated subway train that links Terminals 4 and 4S of Adolfo Suárez Madrid-Barajas Airport.

4 > THALES ESPAÑA is a World Centre of Excellence for Rail Signalling, Space and Security for Energy Production and Distribution Centres.

22.02. AEROSPACE SECTOR

CENTRES OF EXCELLENCE: the high level of the Spanish aerospace sector is reflected in the commitment major foreign multinationals have shown to Spain in the field of R&D. Both AIRBUS and BOEING have established important R&D centres in Spain.

1 > BOEING has established in Madrid its first R&D centre outside the US, Boeing Research and Technology Europe.

2 > The AIRBUS Advanced Composites Centre in Illescas (Toledo), specialising in large curved panels of carbon fibre reinforced plastic, is one of the world’s three Centres of Excellence for carbon fibre.

3 > Spain also hosts the Centre of Excellence for the Horizontal Stabilisers of all the world’s AIRBUS aircraft. It is located in Getafe, Madrid.

4 > Bombardier’s aerospace division has created a Centre of Excellence for maintenance procedures based on the fleets of seaplanes, passenger planes and executive planes in Spain.

22.03. BIOTECHNOLOGICAL AND PHARMACEUTICAL SECTOR

FIVE CENTRES OF EXCELLENCE: some of the sector’s leading foreign multinationals have cho-
Spain is the EU company with the third highest number of R&D centres belonging to multinational companies.

Spain is the EU company with the third highest number of R&D centres belonging to multinational companies.

1. **LILLY** has one of the world’s most important and largest production plants and the most important private R&D centre in Spain. It houses the Medical Chemistry Research Centre and the European Biochemistry and Molecular Biology Laboratory.

2. **GSK Diseases of the Developing World Drug Discovery Center (DDW)** is one of the world’s few that are devoted exclusively to the discovery of new treatments for malaria, tuberculosis and other diseases characteristic of developing countries. It is a Basic Research Centre (BRC), which is of great strategic importance for increasing productivity in the initial stages of the discovery of new drugs.

3. **CELGENE** has recently established its first research centre exclusively devoted to R&D&I outside the United States. Located in Seville, this is the Celgene Institute of Translational Research Europe (CITRE) and it serves as a bridge between Celgene R&D and the research community throughout Europe.

4. The German laboratory **BAYER** chose to concentrate its worldwide production of aspirin in its research centre in the Spanish region of Asturias, making a large investment.

5. Other companies like **SERONO** and **PFIZER** have opened important research centres in Spain with significant investment.

---

### 22.04. **ITC SECTOR**

1. **IBM**: a centre of excellence for delivering solutions for health sector entities (Barcelona).

2. **HP** has established R&D centres in Spain.

3. **AMADEUS**, the global travel industry’s benchmark technology supplier, has chosen Madrid for its new R&D&I centre.

### 22.05. **AUTOMOTIVE SECTOR**

Automotion is the country’s most important industrial sector and is strategic for the economy. Spain, with 2.4 million vehicles manufactured in 2014 (a figure which could rise to 2.6 million in 2015), is a global benchmark in the sector. It is the EU country that makes the second highest number of cars and the ninth in the world. It also boasts first place in the manufacture of industrial vehicles. The sector represents 10% of national GDP, it concentrates 7.2% of the active population and 16% of the country’s global exports, and it is the third industrial sector in investment in R&D&I. The sector’s foreign trade balance posted a surplus of 16 billion € in 2014.

Foreign-owned companies are in the majority in the sector. Eleven of the 15 principal manufacturing groups possess production plants in Spain. Their presence has contributed to the establishment of a powerful automotive components industry. This industry is highly competitive and internationalised. It is also key to the success of the automotive sector and to the global recognition that a car bearing the “Made in Spain” label meets the demand for high quality. The factories in Spain produce 17 car models that are exclusive in the world.

The automotive sector is one of those that demonstrate the strongest commitment to the environment. Its new cars are increasingly more efficient and lower in emissions. Public-private initiatives like the efficient vehicle plans, PIVE, PIMA Aire and PIMA Transporte, are fine examples of such environmental engagement, which has significantly reduced emissions into the atmosphere.