

04. Commitment to stakeholders and creation of shared value

# 4.7

## Environmental value



80 %

activity certified under ISO 14001



0.83 %

hazardous waste with respect to the total



73 %

waste recovery



37.3 %

renewable energy consumed



20.8 %

reduction of emissions intensity



66

environmental management professionals



04. Commitment to stakeholders and creation of shared value / Environmental value

Goals set forth in the 2019-2023 SCSR

Environment



Implementation of an environmental management system that includes all of the company's production activities.	
Achieve a zero-accident rate for serious environmental accidents.	
Global Environmental Footprint: Create a database that classifies high value-added projects according to their environmental footprint, with the purpose of easily adding this information to the bids presented to tenders and help improve on the competitive classification of the company's bids.	

Circular economy



Promote correct waste management practices, focusing on reducing the volume of waste generated and promoting recycling and transformation of such waste into energy as much as possible. Goal: to recycle 35 % of all waste generated by 2023.	
Promote innovative ways of sustainable consumption, which include sustainable products and services, as well as the use of digital infrastructures and services.	
Encourage the efficient use of resources and promote the acquisition and use of recycled or certified materials as much as possible.	

Climate change



Achieve a 5 % reduction of CO <sub>2</sub> emissions in scopes 1 and 2 as compared with 2017.	
Reduce by 5 % the emission rate /k€ in stable centres, as compared to 2017.	
Establish an internal price for carbon.	

<sup>1</sup> Emissions have increased due to the start-up of operations of the Abent 3T cogeneration plant. Excluding this from the analysis, emissions of Scope 1 and 2 for the rest of Abengoa have been reduced by 15 % compared to 2017, which would meet the goal.

04. Commitment to stakeholders and creation of shared value / Environmental value

Abengoa's business model is designed around the creation of innovative technology solutions for sustainability. Thus, **excellent environmental management and fighting against climate change** are intrinsic elements of the business and are present in all its activities and areas.

In this regard, Abengoa maintains its commitment to the protection of the environment in all its activities, going beyond regulatory compliance. This commitment is reflected in the **code of conduct** and is developed in the **corporate social responsibility policies and environmental policy**. Its principles are summarised below:

- 

**Protection of the environment beyond existing legislation**
- 

**Correct and efficient management of environmental impacts**
- 

**Fighting against climate change**
- 

**Efficient use of resources and promoting the acquisition and use of recycled or certified materials**
- 

**Reduction of environmental impacts**
- 

**Continuous improvement and transmission of knowledge**
- 

**Outreach and awareness of environmental protection and sustainable development**

Thanks to its business model and management and operation processes, Abengoa has a positive impact that helps in the responsible management of resources through its clean energy production and transmission systems and with the comprehensive production and management of water. Additionally, in 2019 the company has continued to develop an environmental management system adapted to the strictest standards in this area.

With an approach based on **preventive management**, the company has focused on **improving** the comprehensive **management of its environmental and climate change risks, measuring and reducing its environmental footprint** and the application of the principles of the **circular economy**.



04. Commitment to stakeholders and creation of shared value / Environmental value

## Environmental sustainability in management system

Pillar of the activity	Pillar of internal management	Commitment vector
<p><b>Green economy drivers</b></p>	<p><b>Commitment to protection</b></p>	<p><b>Responsible value chain</b></p>
<p>Abengoa's activity contributes to the improvement of human well-being and social equity, reducing environmental risks and pressure on natural systems and harmonising economic development and efficient consumption of resources, aligning with the guidelines of the United Nations Environment Programme (UNEP).</p> <div data-bbox="147 879 510 1134"> <p><b>Electric power generation from renewable sources</b></p> <p>Solar thermal, photovoltaic and wind power technologies. 2.3 GW built of solar energy, 760 MW under construction and 480 MW of wind power.</p> </div> <div data-bbox="147 1174 510 1350"> <p><b>Water treatment and desalination</b></p> <p>+ 1.7 million m<sup>3</sup>/day of installed desalination capacity and 2.6 million m<sup>3</sup>/day under construction.</p> </div>	<p>Abengoa is aware of the fact that its services and processes must respect the environment and help preserve natural resources. Therefore, it has established its commitment to protecting the environment, which goes beyond simply observing the current laws.</p> <p>In this regard, the centralised management system has a series of procedures to guarantee that the environmental aspects of all projects and facilities are identified and assessed, ensuring that the environmental impacts of the company's activity are taken into account in all decisions made and to minimise them.</p>	<p>The company transmits its environmental undertaking to all suppliers as a key element in its commitment to sustainable development, as established in Abengoa's code of social responsibility for its suppliers and subcontractors, which establishes the following environmental principles:</p> <div data-bbox="1055 863 1406 1046"> <p>All suppliers are required to respect the environment and observe the applicable environmental laws and regulations in their activities.</p> </div> <div data-bbox="1055 1070 1406 1406"> <p>The supplier must use a preventive approach that protects the environment, ensuring it minimises its environmental impact and promoting actions for improvement and efficiency in relation to emissions, water consumption, waste generation and management, energy consumption, use of raw materials and other resources.</p> </div>

## Environmental management

As a result of the restructuring process that Abengoa has had in the last few years, senior management has promoted the **redesign of the company's environmental management systems**, which, although they complied with the common corporate criteria, had been completely autonomous until then. After a thorough review of systems, procedures and resources, and with a focus on optimisation and maximising performance, a **centralised environmental management system** was created two years ago, adapted to the highest standards in this matter.

This management system articulates the mechanisms needed to establish a global and homogeneous diagnosis of its behaviour environmental in any activity or region, and is focused on minimising impacts throughout the life cycle and help combat climate change, guaranteeing that all legal, contractual and best management practice requirements are met.

This management system was structured based on the requirements of the **ISO 14001:2015** standard and is **verified by an external certified entity**.

The company has two verification records available, defined based on the main activities: construction and operations and maintenance services. Currently, **approximately 80 % of the business is certified** based on this norm.

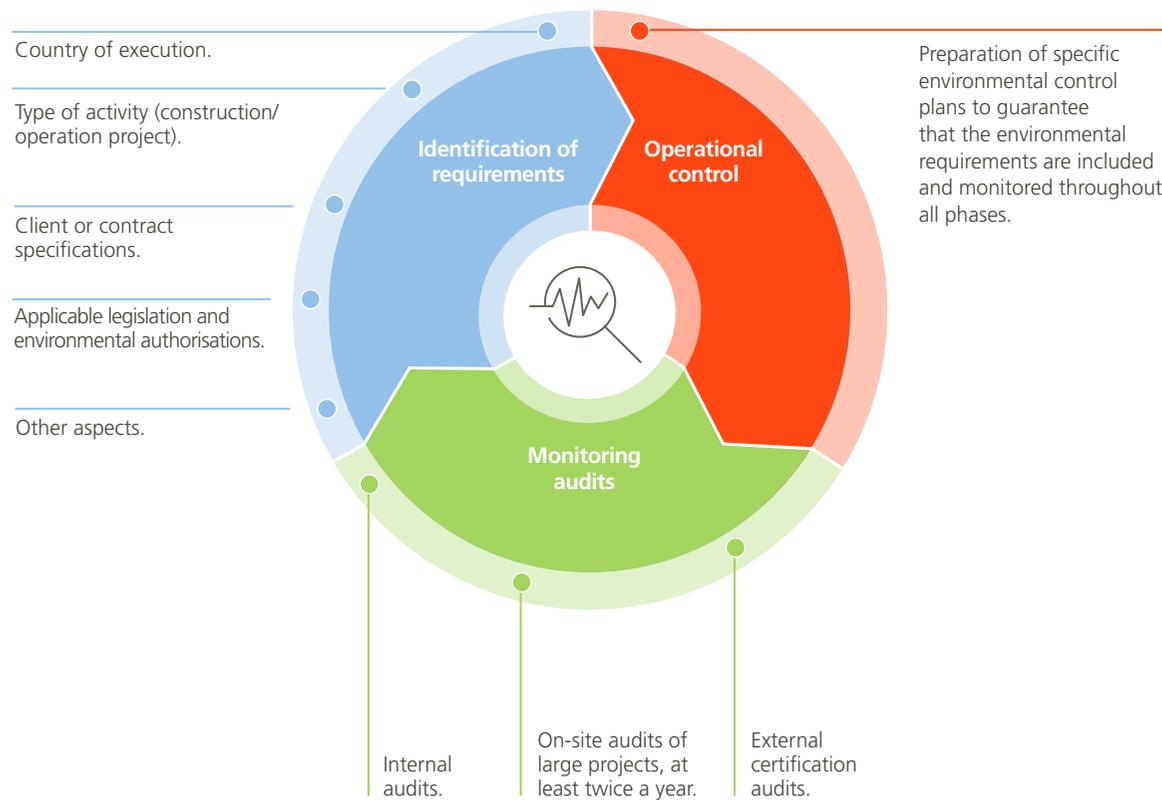


04. Commitment to stakeholders and creation of shared value / Environmental value

Abengoa's environmental management team has a staff specialised in environmental-related matters assigned to each project and activity, as well as a centralised support team, ensuring compliance with the applicable environmental laws, achieving the highest possible level of experience and quality in their

activities. Currently, it is made up of a total of **66 qualified professionals** with experience in all current activities of the company.

Abengoa ensures compliance with the requirements applicable to each project or activity.



04. Commitment to stakeholders and creation of shared value / Environmental value

Abengoa's approach to environmental management is designed as a cyclical improvement process:



Abengoa has an internal IT tool called Integrated Sustainability Management System (ISMS) to record and manage environmental aspects.



04. Commitment to stakeholders and creation of shared value / Environmental value

## Climate strategy

Abengoa's business strategy is aligned with decarbonisation efforts at global level, promoted by the Paris Agreement.

Abengoa, always under the premise of creating innovative technology solutions for sustainable development, contributing to social welfare, joins this global challenge to fight against climate change and its effects, **increasing the presence of renewable energy in the energy mix** of countries in which has activities and **ensuring access to safe drinking water in disadvantaged areas**.

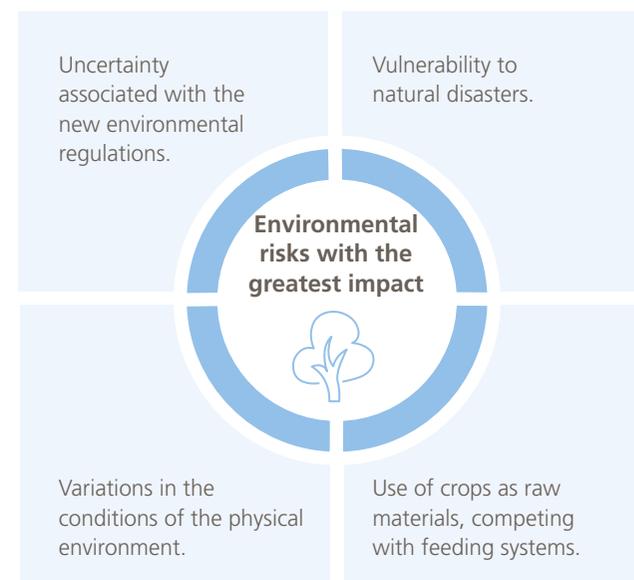
This commitment is not only reflected in its final product, but also in its way of working. In this regard, Abengoa includes in its Strategic CSR Plan 2019-2023 objectives aimed at mitigating GHG (Greenhouse Gas) emissions derived from its activities and improving efficiency.

The implementation of the climate strategy is monitored through corporate social responsibility committees and is made effective through the services that it offers, contributing to the transition to a low carbon economy.

## Environmental and climate change risk management

The scope of Abengoa's risk management system covers all business areas and types of risks, including environmental risks and those associated with climate change, always under the principle of precaution.

This system considers risks derived from the effect of environmental aspects and events that could impact on the activity, as well as those generated by the activity and that could impact the environment, establishing corrective plans of action in each case, reflected in the environmental impact assessments and quality and environment plans of the projects.



04. Commitment to stakeholders and creation of shared value / Environmental value

**Management of risks associated with climate change 201-2**

Abengoa analyses **possible regulatory or physical changes related to climate change** in a comprehensive manner in order to protect its assets and help mitigate the inherent risks.

To accomplish this, Abengoa has a **internal climate risk assessment procedure** incorporated within its general risk management.

This procedure is based on the fifth progress report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). In general, the report shows various scenarios of temperature increase and rainfall variation related to human actions in the face of climate change.

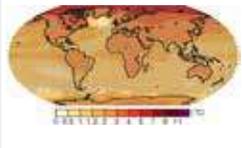
Based on a intermediate global warming scenario, Abengoa establishes a double analysis, based on country risk and activity risk in the short, medium and long term.

In general, the climate change risks of greatest impact for the company are as listed below.

**Country risk**

Projection of temperature increase for the 2081-2100 period.  
 Projection of rainfall variation for the 2081-2100 period.

Temperature



Rainfall



**Activity risk**

Detailed analysis of climate change impacts for the Abengoa's main project types represented in analysis tables, which will serve as a model and contain specific data for the project being analysed.







<b>Transitory</b>	<b>Structural</b> Geographical dispersion of projects and facilities	<b>Regulatory</b> Uncertainty associated with the new environmental and climate change regulations	<b>Reputational</b> Absence of an effective environmental sustainability and climate change strategy
	<b>Physical</b> Variation in the conditions of the physical environment		<b>Punctual</b> Natural disasters
<b>Others</b>	Use of crops as raw materials in the bioethanol production process, competing with feeding systems		

**Final risk assessment** 

04. Commitment to stakeholders and creation of shared value / Environmental value

A series of procedures have been established to identify and control these risks, with the main purpose of creating a common management, mitigation and control culture across all levels of the organisation. These risks are identified and assessed according to their probability of occurrence and their economic and reputational consequences. These two variables finally determine a level of risk. 201-2

Code	Type of risk	Description	Consequences	Type of impact	Business	Probability in the medium/long term	Severity	Management of the risk
A	Structural	Geographical dispersion of projects and centres of the company.	<ul style="list-style-type: none"> <li>Failing to meet the requirements in processes associated with the environment.</li> <li>Failing to comply with the ISO 14001:2015 standard, with an impact on the external certification of the group.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of competitiveness.</li> <li>Possible penalties.</li> </ul>	EPC O&M	Low	Minor	<ul style="list-style-type: none"> <li>Establishment of centralised procedures applicable to all activities of the company across the world.</li> </ul>
B	Regulatory	Uncertainty about the new environmental or climate change regulations associated with the future of the Paris Agreement.	<ul style="list-style-type: none"> <li>Failing to observe the legal requirements that prevent the activities in affected projects or facilities from being carried out.</li> <li>The current uncertainty associated with the United States' withdrawal from the Paris Agreement could have a significant impact on the investments in financial and technical resources in renewable energy projects, mainly in developing countries, and this could affect our renewable energy infrastructure construction activity.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in operational costs.</li> <li>Loss of activity.</li> </ul>	EPC O&M	Low	Moderate	<ul style="list-style-type: none"> <li>Establishment of procedures and measures that guarantee the regular identification of the legal requirements associated with environment-related matters, with the purpose of ensuring they are up-to-date at all times and to have enough margin for action in case these are not observed.</li> <li>Participation in conferences in initiatives and CDP webinars and collaboration with Carbon Pricing Leadership Coalition (CPLC) as a partner.</li> <li>Monitoring and analysis of documents and news about the progress of the Paris Agreement, as well as monitoring of related national and international policies.</li> </ul>
C	Regulatory	New policies that restrict actions that contribute to the acceleration of climate change or political measures that promote the adaptation to climate change.	<ul style="list-style-type: none"> <li>Some examples include the implementation of carbon price fixing mechanisms, the reduction of GHG emissions, use of energy with lower emissions, adoption of energy efficiency measures and the promotion of more sustainable practices in the use of soil.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in operational costs.</li> </ul>	EPC O&M	High	Moderate	<ul style="list-style-type: none"> <li>Establishment of an emission management system, counting the emissions in all areas. This will allow the company to establish mitigation and efficiency goals and initiatives.</li> <li>Establishment of an internal carbon price calculation mechanism, aligning them with the emerging climate regulations established in the Paris Agreement and in accordance with the growth of the business.</li> </ul>

04. Commitment to stakeholders and creation of shared value / Environmental value

Code	Type of risk	Description	Consequences	Type of impact	Business	Probability in the medium/long term	Severity	Management of the risk
D	Reputational	Bad company image as a result of not aligning with the international strategy to combat climate change.	Currently, the fight against climate change is one of main concerns at the global level. The absence of a strategy to fight against climate change can have a negative impact on a company's reputation as regards its stakeholders and, in particular, its clients.	<ul style="list-style-type: none"> <li>Loss of competitiveness.</li> <li>Loss of activity.</li> </ul>	EPC O&M	Medium	Minor	<ul style="list-style-type: none"> <li>Communication and dissemination of Abengoa's climate change strategy, as well as of all initiatives rolled out in the Integrated Report and on the company's website.</li> </ul>
E	Physical	Increase in temperature and variations in the rainfall levels.	<p>Generalised impacts:</p> <ul style="list-style-type: none"> <li>Malfunction caused by structural expansion.</li> <li>Problems associated with corrosion and in the useful life of main components, reducing such a useful life.</li> <li>An extreme increase in rainfall could result in failing to meet certain requirements and finally in the early termination of construction projects, as well as in damage to facilities under operation, leading to service interruptions and downtime.</li> <li>The absence of rain could increase the number of fires, also leading to the early termination of construction projects and damage to facilities under operation.</li> </ul> <p>Specific impacts, by type of technology:</p> <ul style="list-style-type: none"> <li>Alteration of the production of effective power in combined-cycle plants and gas plants, due to a reduction in the mass flow of turbines caused by a reduction in the air density.</li> <li>Alteration of the conditions of feed water in desalination plants, causing an increase in the consumption of chemical products and increasing the probability of contaminating the process due to a rise in the number of algae and molluscs in the facilities.</li> <li>Increased cost of capital in transmission lines due to an increase in the voltage in conductors.</li> <li>Reduction of the availability of water used in processes due to a reduction in the volume of rainfall in specific regions.</li> <li>Alteration of the feed water salinity and pH levels in desalination processes and power plants, with an impact on the performance and leading to a higher use of chemical products.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in operational costs.</li> <li>Loss of activity.</li> </ul>	EPC O&M	High	Minor	<ul style="list-style-type: none"> <li>Improvement of the environmental impact assessment of projects, including the potential alterations caused by variations in temperature and establishing measures to mitigate such effects.</li> <li>Insurance policies to cover<sup>2</sup> the exposure to meteorological phenomena. The company's insurance plan protects all facilities against physical damage and the loss of profits caused by these extraordinary risks.</li> </ul>

<sup>2</sup> There is currently no environmental provision and guarantee information available. The company's insurance plan includes third-party liability policies, which cover the environmental risks of the activities, among other risks. (Include in processes to manage risks).

04. Commitment to stakeholders and creation of shared value / Environmental value

Code	Type of risk	Description	Consequences	Type of impact	Business	Probability in the medium/long term	Severity	Management of the risk
F	Physical	Sea level rise.	Changes in the seawater desalination activity, leading to an increase in the operational costs, as a result of having to implement protection measures to prevent floods.	<ul style="list-style-type: none"> <li>Increase in operational costs.</li> </ul>	O&M	High	Minor	<ul style="list-style-type: none"> <li>Taking into account the potential increase in the sea level when designing desalination plants. Abengoa's plants in operation were built at a safe level above the sea level to prevent the effects of sea level rise.</li> </ul>
G	Other	Use of crops as raw materials in the bioethanol production process, competing with feeding systems.	The growth of the global biofuel market has given rise to controversies at different levels and between different stakeholders (from groups of countries to business entities and individual consumers). It is for this reason that its economic, environmental and social effects are being widely debated on.	<ul style="list-style-type: none"> <li>Loss of activity.</li> </ul>	O&M	Very low	Negligible	<ul style="list-style-type: none"> <li>Abengoa's activity currently includes the design, engineering and construction of bioethanol plants from alternative raw materials, such as solid municipal waste, as in the case of the plant currently being built in Nevada (US), which will have a capacity to produce 10 million gallons of biofuel per year.</li> </ul>

		Probability				
		Very low	Low	Medium	High	Very high
Severity	Negligible	G				
	Minor		A	D	E F	
	Moderate		B		C	
	Major					
	Catastrophic					

For the **risk identification process** several tools are taken into account, such as climatic variation identification maps, GHG emissions accounting, financial analysis, identification of legal requirements and the experience of the risk departments.

To control and manage these risks, Abengoa establishes **mitigation mechanisms**, such as increasing the safety coefficients in the design of projects considering the least favourable meteorological and environmental parameters or research focusing on the use of alternative fuels.

**These and other risks are monitored**, as well as the mitigation measures applied, to develop the **lessons learned**, transforming risk management into a mature process that can provide feedback and be used to implement measures based on the experience gained in other projects, whether new or existing.

04. Commitment to stakeholders and creation of shared value / Environmental value

**Internal carbon price at Abengoa**



Abengoa is aware that one of the main current tools to foster the transition toward a low carbon economy is the establishment of internal carbon prices, so that the costs derived from the economic, social and environmental consequences of GHG emissions on the become tangible.

In this regard, Abengoa has defined a climate action mechanism by establishing an internal carbon price, aligning it with the emerging climate regulation as a result of the Paris Agreement and with the evolution of the business.

The initiative involves including the requirement to calculate the costs that would be incurred by the GHG emissions linked to a new project according to the internal price defined by the company.

This monetisation of the CO2 emissions will allow Abengoa to optimise decision-making and business strategy planning, making the company aware of the economic cost of new projects' emissions and thereby anticipating regulatory changes aimed at monetising GHG emissions.

**Opportunities associated with climate change**

The identification and analysis of risks associated with climate change allows the company to identify new business opportunities associated with climate change. A low-carbon economy offers business growth opportunities:

Type of opportunity	Description	Business	Management of the opportunity
Business	Boosting the renewable energies business in the event stricter regulations are applied to the use of fossil fuels.	EPC	Engineering and construction of renewable energy plants. 2.3 GW* of built solar energy, 760 MW under construction and 480 MW of wind power.
Business	A greater demand for water due to the potential increase in temperature or the greater number of hours of light caused by a drop in the rainfall volumes.	EPC	Engineering and construction of desalination plants and infrastructure for the transport of water. + 1.7 million m <sup>3</sup> /day of installed desalination capacity and 2.6 million m <sup>3</sup> /day under construction.
Reputational	Increased pressure from stakeholder groups in relation to the establishment of measures to combat climate change, arising from society's greater awareness of the need to protect the environment.	EPC O&M	Communication, dissemination and improvement of Abengoa's climate change strategy, following the lines of work established in the Strategic CSR Plan.



04. Commitment to stakeholders and creation of shared value / Environmental value

## TCFD recommendations

Abengoa has incorporated the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) regarding the **involvement of Senior Management** in managing risks associated with climate change; establishing **an identification and risk management system**, both at global and facility levels, in the short, medium and long term; **integrating** this system **in the company's general risk management processes; and disseminating the metrics** that the company uses to assess risks and opportunities associated with the climate and risk management process.

Scope	Recommended aspects to break down	Location of the information
Governance	A. Describe shareholder/board oversight of climatic risks and opportunities.	<ul style="list-style-type: none"> <li>As indicated in this chapter, the scope of Abengoa's risk management system covers all business areas and types of risks, including environment risks and those associated with climate change, always under the principle of precaution.</li> <li>Risk Chapter, section 'Due diligence of the highest governance body on risk management'.</li> </ul>
	B. Describe management's role regarding the assessment and management of climate risks and opportunities.	<ul style="list-style-type: none"> <li>As indicated in this chapter, the scope of Abengoa's risk management system covers all business areas and types of risks, including environment risks and those associated with climate change, always under the principle of precaution.</li> <li>Risk Chapter, section 'Due diligence of the highest governance body on risk management'.</li> </ul>
Strategy	A. Describe the risks and opportunities related to climate that the organisation has identified in the short, medium and long term.	<ul style="list-style-type: none"> <li>Environmental Value Chapter, section 'Management of risks associated with climate change'.</li> </ul>
	B. Describe the impact of risks and opportunities associated with the climate in the organisation's business, strategy and financial planning.	<ul style="list-style-type: none"> <li>Environmental Value chapter, section 'Management of risks associated with climate change'.</li> </ul>
	C. Describe the resilience of the organisation's strategy, taking into account different scenarios associated with the climate, including a scenario of 2° C or less.	<ul style="list-style-type: none"> <li>Environmental Value Chapter, section 'Management of risks associated with climate change'.</li> </ul>
Risk management	A. Describe the organisation's processes to identify and assess the risks associated with the climate.	<ul style="list-style-type: none"> <li>Environmental Value Chapter, section 'Management of risks associated with climate change'.</li> </ul>
	B. Describe the organisation's processes to manage the risks associated with the climate.	<ul style="list-style-type: none"> <li>Environmental Value Chapter, section 'Management of risks associated with climate change'.</li> </ul>
	C. Describe how the processes to identify, assess and manage the climatic risks are integrated in the organisation's global risk management.	<ul style="list-style-type: none"> <li>As indicated in this chapter, the scope of Abengoa's risk management system covers all business areas and types of risks, including environment risks and those associated with climate change, always under the principle of precaution.</li> <li>Risk Chapter, section 'Due diligence of the highest governance body on risk management'.</li> </ul>

04. Commitment to stakeholders and creation of shared value / Environmental value

Scope	Recommended aspects to break down	Location of the information
Metrics and objectives	A. Report the metrics used by the organisation to assess climatic risks and opportunities in line with its strategy and its risk management process.	<ul style="list-style-type: none"> <li>▪ Environmental Value Chapter, section 'Management of risks associated with climate change'.</li> <li>▪ Environmental Value Chapter, section 'Climate footprint'.</li> <li>▪ Environmental Value Chapter, section 'Energy footprint'.</li> </ul>
	B. Report Scope 1, Scope 2 and, if appropriate, Scope 3 GHG emissions and their associated risks.	<ul style="list-style-type: none"> <li>▪ Environmental Value Chapter, section 'Climate footprint'.</li> </ul>
	C. Describe the objectives used by the organisation to manage risks and climate opportunities and its performance in relation to the objectives.	<ul style="list-style-type: none"> <li>▪ Environmental Value Chapter, section 'Climate footprint'.</li> <li>▪ Environmental Value Chapter, section 'Energy footprint'.</li> </ul>



Abengoa belongs to the **Carbon Pricing Leadership Coalition (CPLC)**, a joint initiative of 34 governments, more than 160 companies and 85 strategic partners, promoted at the Paris Climate Summit in December 2015 and administered by The World Bank Group, whose common goal is to foster systems and mechanisms to set carbon prices all over the world.

By adhering to it, Abengoa acquired a number of commitments, among which are the following:

- Establish an internal carbon price high enough to affect investment decisions and thus reduce greenhouse gas emissions.
- Publicly advocate the importance of establishing a price for carbon through policies that take into account each country's specific economic and political context.
- Report the progress of the two previous criteria in the public information reported by the company.

And all with the intention of contributing to the goal of limiting the increase of the global average temperature to 1.5 °C above pre-industrial levels.

**CEOsCall2Action**  
A new Deal for Europe



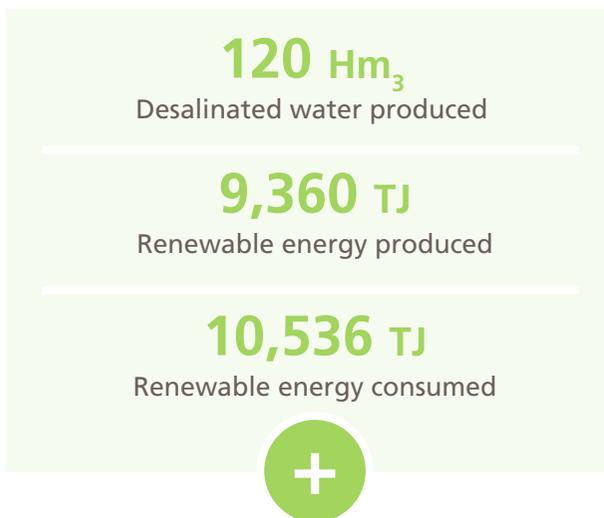
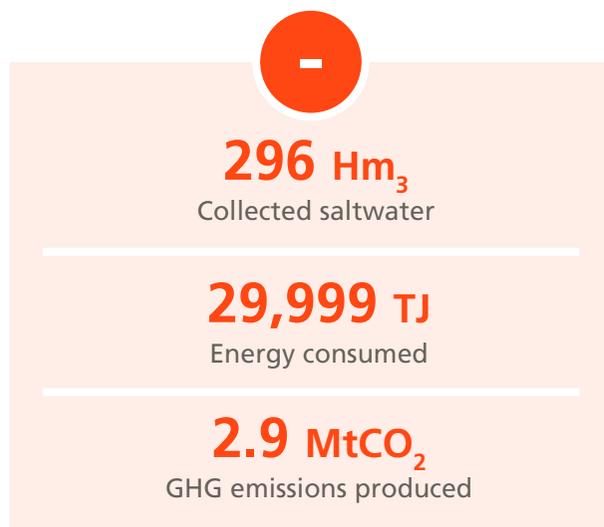
Abengoa responded to the call to action for CEOs 'A New Deal for Europe' promoted by CSR Europe.

This initiative brings together European leaders in favor of establishing a global strategy for a sustainable Europe by 2030, in order to accelerate sustainable growth, act against climate change and create inclusive prosperity.

Abengoa's participation in this initiative serves to materialize and strengthen its commitment to act against climate change and its position alongside the top European leaders in climate action.

04. Commitment to stakeholders and creation of shared value / Environmental value

## Main figures



## Climate footprint

Abengoa is fully aware of the fact that, beyond offering sustainable solutions aimed at mitigating and adapting to climate change, it is necessary to do so efficiently, with the lowest possible generation of emissions in all its operations.

In this regard, Abengoa records its GHG emissions for all its scopes and sources. To this end, it has procedures and tools designed for this purpose, as well as over 12 years' experience in measurement.

The methodologies are based on the reports from the Intergovernmental Panel on Climate Change (IPCC) and emission factors used by different sources:

- IPCC.
- IEA: International Energy Agency.

- DEFRA: Department for Environment, Food and Rural Affairs, of the United Kingdom.
- National inventories of GHG emissions.
- Environmental declarations of products.

Direct emissions have increased due to the start-up of the Abent 3T cogeneration plant in Mexico, whose combustion emissions amount to 535,654 tCO<sub>2</sub>, equivalent to a 48 % of the company's direct emissions.

GHG emissions (tCO <sub>2</sub> eq) <i>305-1, 305-2, 305-3</i>	2019	2018	2017
Direct emissions	1,125,206	738,458	652,332
Indirect emissions (scope 2)	236,236	313,746	315,283
Other indirect emissions (scope 3)	313,272	773,486	589,825
Total	1,674,714	1,825,690	1,557,440

GHG emissions (tCO <sub>2</sub> eq)	2019	2018	2017
Direct emissions from biomass	1,211,686	1,331,008	1,103,015

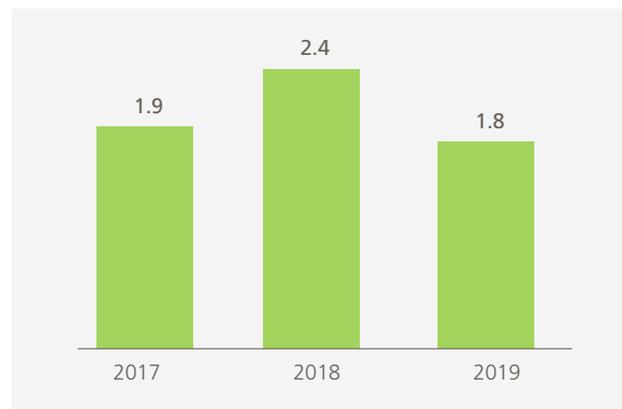
04. Commitment to stakeholders and creation of shared value / Environmental value

Intensity of GHG emissions 305-4

1.9 tCO<sub>2</sub>/sales\*

\* The ratio differs from that reported in the Non-Financial Information Statement and in the Responsible Management Balance Sheet, since scope 3 emissions considered were calculated after the annual accounts were published.

Ratio tCO<sub>2</sub>/thousands of €



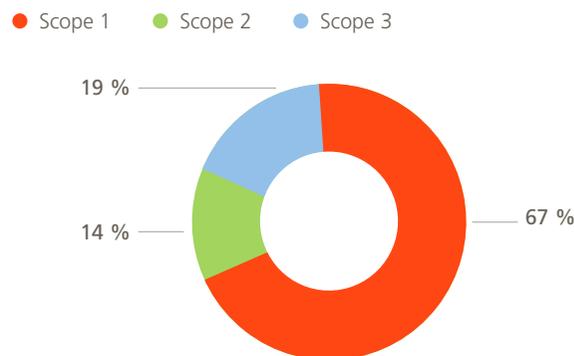
The ratio has been reduced by 20.8 % compared to 2018.

Scope 3

Scope 3 emissions represent 19 % of Abengoa’s global inventory, with supplies being the main source given the weight of construction activities in Abengoa’s business.

The evolution of emissions in this scope has been positive, having achieved a reduction in virtually all sources.

GHG emissions by source type (tCO <sub>2</sub> eq)	2019	2018	2017
Supplies	231,845	651,676	474,026
Business trips	1,317	1,388	N.D.
Waste management	3,558	7,560	N.D.
Losses in the distribution of consumed electricity	49,388	80,363	81,112
Fuel value chain	27,164	32,499	34,687



Other polluting emissions 305-7

Air pollution has many harmful effects on the environment. It contributes to reducing the amount of nutrients available in the substrate, preventing the growth of plants and exacerbating the effects of climate change.

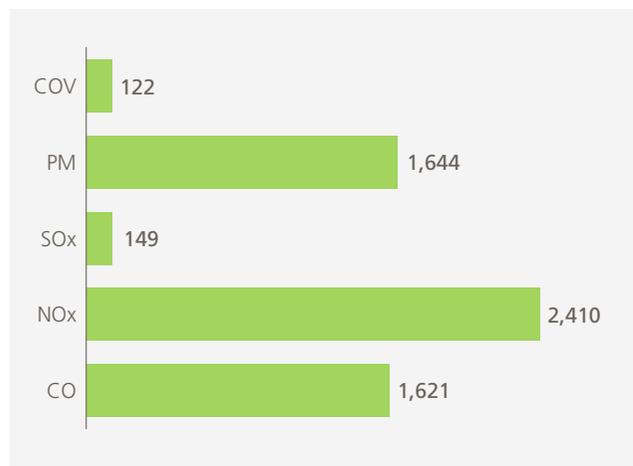
Additionally, emissions of nitrogen oxides and sulphur react in the atmosphere producing acid rain, causing an increase of nutrients in water masses that endangers aquatic ecosystems, since it causes plants and other aquatic organisms to grow in abundance, consuming the dissolved oxygen and increasing excess organic matter.

These effects are exacerbated by the fact that currently, the way of life of large part of the population is closely linked to the generation of air pollutants: transport, industry, agriculture and even home life.

To this end, the company has put together the mechanisms required to conduct the global and homogeneous diagnosis of its environmental behaviour in any activity or region, guaranteeing that all legal, contractual and best management practice requirements are identified and met and that these focus on minimising the impacts across the process life cycle, while also promoting the fight against pollution in all its aspects.

04. Commitment to stakeholders and creation of shared value / Environmental value

Pollutants (t)	2019	2018	2017
CO	1,621	1,471	1,479
NOx	2,410	1,871	1,882
SOx	149	224	223
PM	1,644	1,909	1,923
COV	122	114	114



The parameters used to calculate atmospheric pollutants have been extracted from the joint EMEP/EEA air pollutant emission inventory guidebook 2019.

The generalised increase in pollutant emissions is due to the start-up of the Abent 3T cogeneration plant, increasing the direct energy consumption of the company by 28 %.

Additionally, in the construction projects noise measurements are carried out according to their respective environmental impact assessments, complying with the current legislation at each location.

## Energy footprint

One of the most important challenges facing humanity is energy management, given the growing technologisation of processes and the increase in the world's population. This fact, coupled with a still high dependence on fossil energy only reinforces the need to increase the presence of renewable energy in the energy mix and promote efficiency in the production and use of energy.

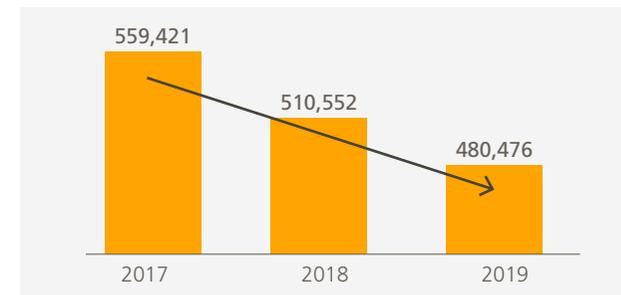
In this regard, Abengoa plays a key role by providing solutions for engineering, construction and operation of production technologies for clean energy. Additionally, it seeks efficiency in its consumption, promoting the use of renewable energy, which in 2019 was 37.2 %.

The increase of natural gas consumption is due to the start-up of the Abent 3T cogeneration plant, whose consumption of natural gas was of 7,944 TJ, increasing the overall energy consumption by 28 %.

### Direct energy consumption 302-1

Type of fuel (GJ)	2019	2018	2017
Biofuels	43,647	52,145	47,837
Biomass	10,492,870	12,229,325	12,317,116
Petroleum derivatives	698,271	2,028,397	1,919,379
Natural gas	17,035,372	8,431,475	8,555,514
<b>Total</b>	<b>28,270,160</b>	<b>22,741,342</b>	<b>22,839,846</b>

### Consumption of intermediate energy



Abengoa consumes **certified renewable energy** at the Almeria desalination plant, comprising 3.72 % of the total electricity consumed.

### Energy intensity GJ / Sales (thousands of €) 302-3

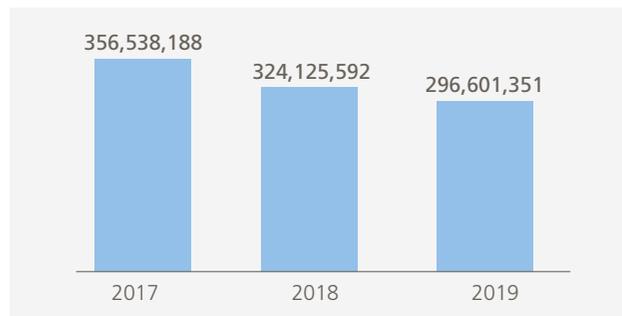


04. Commitment to stakeholders and creation of shared value / Environmental value

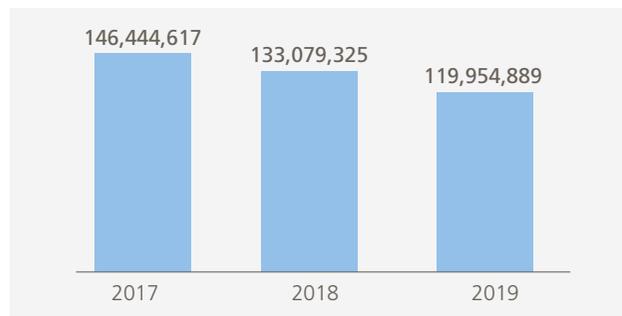
## Water footprint

The growing pressure on water demand makes it essential to design control measures for its management and administration. In this regard, Abengoa offers solutions for the comprehensive water cycle through desalination and water treatment, as well as constructing hydraulic infrastructures, and promoting optimisation and efficiency in all its facilities and projects, with the aim of keeping consumption to a minimum.

Seawater collection (m<sup>3</sup>) 303-1



Desalinated water produced (m<sup>3</sup>)

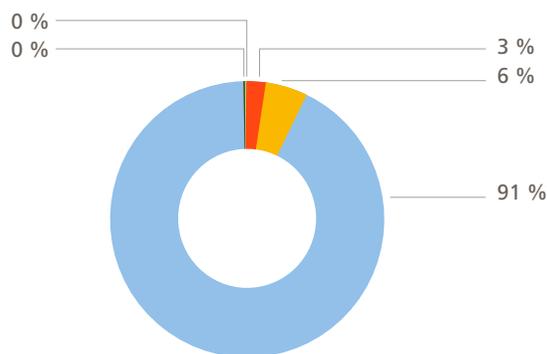


The water produced by Abengoa at its desalination plants has generated a positive impact on the planet of 120 Hm<sup>3</sup>, equivalent to the annual consumption of 2.42 million people for one year.

Collection of water from other sources 303-1

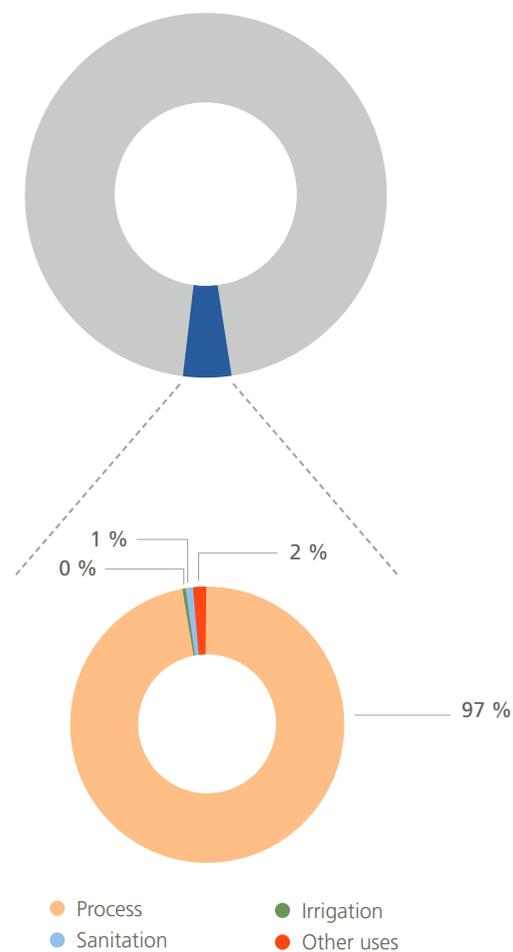
	2019	2018	2017
Well water	179,109	207,891	312,011
Tap water	358,412	356,158	451,581
River water	5,895,336	6,063,855	5,557,546
Rainwater	7,537	2,786	4,542
Wastewater	5,776	1,056,696	26,231
<b>Total general</b>	<b>6,446,170</b>	<b>7,687,386</b>	<b>6,351,911</b>

- River water
- Well water
- Tap water
- Rain water
- Wastewater



Type of use

- Desalination
- Other uses



04. Commitment to stakeholders and creation of shared value / Environmental value

## Abengoa and the circular economy

It is a reality that the current economic model has proved to be unsuccessful, based on an unlimited consumption of resources and not considering environmental factors in its assessment of wealth and development. Today more than ever, it is necessary to turn to a model that optimises resource use, promoting reduction and reuse, and making it more sustainable and competitive.

In this respect, Abengoa continues to work in the incorporation of the circular economy's principles into its processes, products and services, and has established a line of action in its strategic CSR plan to meet its commitments in this area:

- A** Encourage the efficient use of resources and promote the acquisition and use of recycled or certified materials.
- B** Reduce the environmental impacts in the life cycle of Abengoa's products and services, including the supply chain and raw material production systems.
- C** Promote correct waste management practices, focusing on reducing the volume of waste generated and promoting recycling and transformation of such waste into energy as much as possible.

### Waste

Regarding waste, Abengoa has managed a total of 84,803 tonnes in 2019, of which only 697 tonnes were hazardous waste.



Final treatment (t) <i>306-2</i>	2019	2018*	2017
Temporary storage	819	64	0
Composting	223	19	3
Permanent deposit	151	855	548
Incineration	77	41	46
Recycling	17,045	29,280	3,891
Energy recovery	75	529	561
Reuse	44,833	20,105	689
Landfill	7,250	31,406	37,844
Others	14,330	11,163	1,890
<b>Total general</b>	<b>84,803</b>	<b>93,462</b>	<b>45,472</b>

\* The 2018 data has been updated after modifying the criterion for the treatment of construction and demolition waste of an Abengoa project in Peru and the Shuaibah (Saudi Arabia) construction project.

04. Commitment to stakeholders and creation of shared value / Environmental value

Fruit of the effort of the entire company, the **waste in 2019 was of 73 %**, compared with 53 % in 2018. This is mainly due to greater reuse of aggregates and construction waste and recycling of sludge and metal waste.

Abengoa is aware of the environmental impacts that can be caused by incorrectly managing the heat transfer fluid (HTF) used in the parabolic trough power plants it operates, in the event of accidental spillages. In this regard, the Chairman’s office ensures all HTF spillages are monitored properly, with the purpose of ensuring a speedy response is provided and that the preventive measures required are implemented in all plants, regardless of whether they have been affected by the spillage or not. During 2019, there have been 7 spillages, with 17,495 litres of HTF spilled in total.

**Use of materials**

Abengoa encourages the efficient use of resources and promotes the acquisition and use of recycled or certified materials. [301-1](#)

There has been a general increase in materials purchased, equivalent to the increase in construction activities in the report year.

In 2019, it has purchased 8,063 kg of paper for the three main head offices<sup>3</sup> of Abengoa in Spain, which are FSC and PEFC certified.

	2019	2018	2017
Steel (Kg)*	71,680,622	4,859,709	N.D.
Wood (Kg)	11,561,806	23,266,223	N.D.
Cement (Kg)	6,223,113	2,565,775	N.D.
Concrete (Kg)*	630,025,264	102,361,584	N.D.

\* Details of the 2018 steel and concrete have been modified by applying the methodology used for 2019.

**Biodiversity**

Abengoa’s strategy for biodiversity conservation consists of the combination of **measures for the prevention, management and restoration** of the impacts derived from its activity.

Prior to starting a project, Abengoa performs **environmental impact assessments** to identify and manage the effects its activity will have on the environment.

On all projects, Abengoa takes into consideration the prevention and restoration of any areas that may be affected by the development of its activities. For this purpose, the company implements measures for habitat protection and restoration; reforestation; and monitoring, rescue and relocation of fauna, among others.

In cases where the impacts caused by Abengoa’s activities cannot be minimised, compensation actions are implemented, as provided in studies carried out previously.

In addition, it establishes **environmental monitoring plans** to review the measures implemented.

**Protected areas**

Specifically, the company analyses each facility to consider whether it is inside a protected area and the fauna and flora species that may be affected.

During 2019, Abengoa’s activity affected special protection areas in two locations: [304-1](#)

- A desalination plant construction project in Agadir (Morocco), located within the Parc National Du Souss-Massa.
- A protected area of 17.4 hectares in the São Joao and São Luiz bioethanol plants.

In these activities the significant impacts and their duration and reversibility have been identified and evaluated.

**Protected species**

Some of the most notable protected plant and animal species that are affected by Abengoa’s activity are the following: [304-4](#)

- Ghaf tree (*Prosopis cineraria*), protected by the UAE’s Federal Law No. 24 of 1999 for the protection of the environment
- Arabian oryx (*Oryx leucoryx*), recognised as a vulnerable species by the IUCN.
- Sand gazelle (*Gazella marica*), recognized as a vulnerable species by the IUCN.
- Mountain gazelle (*Gazella gazella*), recognized as a vulnerable species by the IUCN.
- Cedar (*Cedrela odorata*), recognised as special protection species according to NOM -059-Semarnat-2010.
- Painted bunting (*Passerina ciris*), recognised as special protection species according to NOM -059-Semarnat-2010.
- Dot-winged antwren (*Microrhopias quixensis*), recognised as special protection species according to NOM-059-Semarnat-2010.
- Boa (*boa constrictor*), recognised as endangered species according to NOM -059-Semarnat-2010.

<sup>3</sup> Palmas Altas Campus (Seville), Torrecuellar centre (Seville) and office on Manuel Pombo Angulo (Madrid).

04. Commitment to stakeholders and creation of shared value / Environmental value

Additionally, the effect of desalination plant construction activities on coral reefs is notable. In the case of the desalination plant located in Shuaibah, the following species are identified:

- Hard corals:
  - *Pocillopora, Stylophora, Acropora, Porites, Coscinarae, Echinopora, Favites, Diploastrea, Fungia, Montipora and Lobophyllia.*
- Soft Corals:
  - *Xenia, Heteroxenia and Sinularia.*

**Impacts on biodiversity**

In 2019, the construction activity has been the one with the greatest impact on biodiversity, notably the parabolic trough collectors installation projects and the construction of desalination plants. In this regard, the following projects are notable: [304-2](#), [304-3](#)

Type of project	Impacts on biodiversity	Measures
<p>Parabolic trough collectors at the Mohammed bin Rashid Al Maktoum Solar Park in Dubai</p>	<ul style="list-style-type: none"> <li>■ Combustion emissions and generation of dust caused by earth-moving works.</li> <li>■ Dune ecosystem loss, habitat of animal and plant species of Al Marmoom Desert Conservation Reserve.</li> </ul>	<ul style="list-style-type: none"> <li>■ Relocation of the main plant and animal species, in collaboration with the Dubai Municipality Natural Resources Conservation Section.</li> <li>■ Installation of feeding stations and water supply for the Arabian oryx and gazelles in the boundaries of the project.</li> <li>■ Minimisation of lighting to avoid excessive artificial light.</li> <li>■ Regarding air pollution, activities involving earth-moving works are minimised in the event of strong winds, construction areas are watered down and traffic speed is reduced to 20 km/h.</li> </ul>
<p>Desalination plant in Shuaibah, Saudi Arabia</p>	<ul style="list-style-type: none"> <li>■ Severe impact on marine flora. The construction process increases the turbidity and prevents the introduction of light, hindering the photosynthesis of marine flora.</li> </ul>	<ul style="list-style-type: none"> <li>■ The water intake and brine discharge structures will be buried to ensure that the recolonization potential of the habitat in the ocean bed is possible once the construction process is completed.</li> <li>■ In addition, coral relocation will be performed as a compensatory measure to avoid net habitat loss in the area.</li> </ul>
<p>Cogeneration plant in Mexico</p>	<ul style="list-style-type: none"> <li>■ Alteration of the vegetation has a direct impact on fauna, affecting species' mobility by transforming their biological corridor and the availability of habitats.</li> </ul>	<ul style="list-style-type: none"> <li>■ Flora and fauna rescue and relocation programmes. Establishment of two buffer areas. Environmental monitoring. Incorporation of green areas.</li> </ul>

## 04. Commitment to stakeholders and creation of shared value / Environmental value

As a short-term objective, Abengoa proposes in the Strategic CSR Plan the establishment of biodiversity valuation studies and the conservation actions that Abengoa performs, with the aim of applying them to the rest of the activities, provided that the conditions allow it.

The company received no environmental fines or penalties in 2019. [307-1](#)

### Outreach and awareness campaigns



Abengoa is committed to the environmental awareness of its staff, in order to increase their involvement in achieving the objectives of the Strategic CSR Plan.

For this purpose, the following communications channels were used in 2019:

- **Intranet space** where the efficiency measures in the use of natural resources and good environmental practices are recorded.
- **Monthly newsletters** for the dissemination of efficiency measures and recommendations for the good use of resources.
- Articles on **Abengoa's blog 'The energy of change'**.
- Appeals on **social media**.
- **Internal communications**.
- **Screens in work centres**.

### Palmas Altas Campus: efficient office

Abengoa promotes energy efficiency in all areas of its activity, extending not only to its projects, but also in its offices and facilities.

In this regard, the U.S. Green Building Council (USGBC) recognises Abengoa with the **LEED Platinum certification** (Leadership in Energy & Environmental Design) awarded to its Palmas Altas Campus headquarters, located in Seville (Spain).

LEED is a voluntary sustainable building certification system based on the incorporation of systems that contribute to energy and water efficiency, the use of alternative energies, the separation of waste and the improvement of interior environmental quality and the selection of materials.

This certification acknowledges Abengoa's commitment to responsible environmental management, as well its involvement in the development of actions and initiatives that contribute to improving efficiency in the performance of its activity.

Among other initiatives, Abengoa makes available to its workers a direct connection to the metropolitan area with a walkway built by Abengoa, which crosses the SE-30 and allows pedestrians and cyclists to cross it, and is also used by the public buses of the Tussam and Metropolitan Transport Consortium of Seville.

Additionally, during 2019 the Led light fittings change was completed to optimise parking lighting. 480 lamps were replaced, resulting in energy savings of 86 %.

