



2021  
Environmental,  
Social and  
Governance Report

Antea Group

Understanding today.  
Improving tomorrow.

[www.anteagroup.fr](http://www.anteagroup.fr)







## 2021 Environmental, Social and Governance Report

COMMUNICATION  
ON PROGRESS



This is our **Communication on Progress** in implementing the Ten Principles of the **United Nations Global Compact** and supporting broader UN goals.

We welcome feedback on its contents.

### Environmental, Social and Governance Report

Antea Group France - May 2022, update november 2022

Thank you to the many employees who participated in the drafting of this new edition of our Communication on Progress, which also constitutes Antea Group France's ESG report.

Comments and suggestions are welcome and can be sent to [RSE@anteagroup.fr](mailto:RSE@anteagroup.fr)

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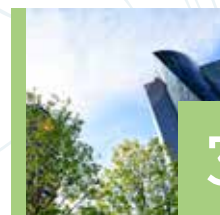
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**Pascal VOYEAU**

*Managing Director  
Antea Group France*

The years go by...and surprise us.

While the year 2020 was marked by the start of the Covid pandemic and the bewilderment that accompanied it, 2021 has been incredibly dynamic. While we usually see this dynamism reflected in figures and percentages, we also like to see it expressed in actions.

The very clear recovery of our activities in 2021 is undeniably the sign of better consideration of environmental aspects in projects. This brings hope and momentum for a world that really needs it. The climate change that is unfolding today before our very eyes commands us to make every effort to limit its scope. However, it also seems necessary to better prepare ourselves for these changes, which are without doubt partly unavoidable. We consider that it is our responsibility today, and indeed that of all Antea Group teams, to contribute to better understanding these phenomena to better tackle them.

Our ESG report thus addresses this desire to reflect the dynamism observed in 2021 with very concrete actions. The topics covered here are very diverse. They evoke both the internal commitment of our teams and the innovative projects carried out on behalf of our clients.

With regard to our own functioning and being aware of the challenges we must collectively face, we have developed a new 3-year company project: WeAct. It is based on 64 actions to bring to fruition our progress in protecting the environment, as well as ethics, diversity of backgrounds and talent, but also living better together. These quantifiable actions encourage us to transform our work to improve our daily lives and, whenever possible, to prepare our environment for emerging upheavals.

We confirm this intent by our renewed commitment to the Global Compact, its ten principles and 5 Sustainable Development Goals for which we especially mobilize our efforts.



**Pascal VOYEAU**

*Managing Director  
Antea Group France*



## WeAct, Our 2021-2024 Company Project A SHARED VISION FOR A CO-DESIGNED PROJECT

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In 2021 Antea Group France launched its new company project, WeAct, for the next three years.

The WeAct project, which follows on from the SmartBuilders project initiated in 2017, reflects who we are and where we are heading.

It is based on 3 founding pillars of our commitments and our identity, reflected in 64 actions in which everyone can find his or her place and get involved.

These actions constitute a real roadmap for the deployment over the next three years of our ESG policy and our commitments in terms of well-being at work, diversity, health and safety, as well as our environmental commitments in the functioning of the company and in our engineering projects.

### Focus 1 WE ARE OPEN AND COMMITTED

*Solidarity, respect and safety for everyone and respect for the environment are our values and the identity of our group. We are proud to share them and to implement them on a daily basis and in our external commitments.*

#### We act towards...

- 1- A responsible commitment**
  - > Develop our commitment to the Sustainable Development Goals
  - > Support actions related to our ESG policy
  - > Support employees' initiatives for the protection of the environment and resilience to climate change
- 2- Respect and safety for all**
  - > Respect of human rights and ethics
  - > Do everything possible for everyone's safety
- 3- Welcoming and supporting all employees**
  - > Promote well-being at work and diversity
  - > Develop our welcome and integration programs
  - > Support employees in their career path
- 4- Cohesion and solidarity**
  - > Strengthen team cohesion and the sense of belonging
  - > Promote mutual aid

**500**  
tons CO<sub>2</sub>  
/year



This is the CO<sub>2</sub> equivalent quantity per year that we are committed to reducing.

### Focus 2 WE ARE THE PARTNER OF CHOICE

*Our clients, businesses, and local authorities recognize us, set us apart, choose us and place their trust in on the long term. We support them in taking their environmental challenges into account, in France and around the world.*

#### We act towards...

- 1- The quality of client relationship**
  - > Prioritize the quality of client relationship
  - > Build loyalty
  - > Co-build innovative projects
- 2- The quality of our services**
  - > Guarantee adapted solutions
  - > Deliverables adapted to the specific project features
  - > Anticipate the needs of our clients
- 3- Visibility and recognition of our expertise**
  - > Rely on our technical skills and our expertise to develop our reputation
  - > Invest in social networks
- 4- International development**
  - > Develop our international activities in the private sector
  - > Encourage our teams to go international
  - > Expand our services to new regions of the world



The well-being and satisfaction of all our employees are the objectives that we set ourselves.



Artificial intelligence, geo-referencing, integrated database, etc.

A vocabulary that is increasingly characterizing our business processes and which we are getting used to!

### Focus 3 WE ARE STAKEHOLDERS OF A SUSTAINABLE AND VIRTUOUS FUTURE

*Our multiple skills, our technical excellence, our innovative solutions and our powerful digital tools enable us to design sustainable, resource-efficient facilities in the service of the resilience of regions and of business activities faced with climate extremes.*

#### We act towards...

- 1- Excellence in engineering and offering multiple skills**
  - > Deploy our technically differentiating expertise
  - > Promote multi-disciplinarity
  - > Develop the innovation dynamic
- 2- Sustainable facilities**
  - > Design solutions making it possible to control impacts and preserve resources
  - > Work towards resilience to climate extremes
- 3- Powerful digital tools**
  - > Accelerate our digital transformation
  - > Develop innovative solutions for environmental data

The first results generated by this new strategic plan will be seen essentially starting 2022. Some of the actions launched at the end of 2021 can be found throughout this report.

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# 1



Find the description of the SDGs on pages 70/71



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## Principle 1

Promote and comply with the protection of International Human Rights Law

## Principle 2

Ensure we are not complicit in Human Rights violations

## Principle 10

Take action against corruption in all its forms, including extortion and bribery

The United Nations' Universal Declaration of Human Rights and the Charter of Fundamental Rights of the European Union are integral parts of Antea Group's values. Our code of ethics makes it possible to fight against all corruption, influence peddling, illicit agreements, favoritism or conflicts of interest.

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## Human Rights and Ethics

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We support the mission of the United Nations Global Compact to:

MOBILIZE A MOVEMENT OF RESPONSIBLE COMPANIES AND ECONOMIC STAKEHOLDERS TO BUILD THE WORLD WE WANT TOGETHER



# 1.1

## Our Human Rights commitments

As the official local contact of the United Nations Global Compact, Global Compact France brings together more than a thousand companies and organizations around issues related to ESG and sustainable development. Global Compact France offers its members a voluntary commitment framework built on the basis of ten principles to be complied with in terms of human rights, labor law, the environment and the fight against corruption. It is also mandated by the UN to support the implementation of Agenda 2030 and adoption of the Sustainable Development Goals by the French business community.

**Antea Group France has been a member of the Global Compact since June 18, 2003.**

The first 2 principles of the Global Compact are about Human Rights.

The United Nations Universal Declaration of Human Rights of December 10, 1948, and the Charter of Fundamental Rights of the European Union of December 18, 2000, are integral parts of Antea Group's values. The group defends the indivisible and universal values stemming from these texts, such as dignity, equality, solidarity, citizenship, and justice.

These values are found in every aspect of the functioning of the company, particularly in our management of Human Resources – no discrimination in hiring, diversity, gender equality (see page 16) - and in the application of our code of ethics in the exercise of our activities (see next page).

In addition, we ensure that the selection of our suppliers and subcontractors meet our requirements in terms of respect for Human Rights, legislation on labor rights and the environment. To do this, all of our suppliers are automatically assessed as required in our database according to HSQE (Health Safety Quality Environment) criteria. Audits of our main partners are carried out annually by our network of HSQE representatives.



## 1.2

### Our commitments in terms of respect for ethics and professional conduct

Strengthening regulations for the fight against corruption and influence peddling constitutes a major challenge for our group, which is developing in France and internationally in highly complex and very competitive environmental engineering markets.

In 2020, Antea Group actively deployed its code of ethics to all employees and stakeholders. It is available to everyone on our website <https://www.anteagroup.fr/charte-ethique>.

Antea France and IRH Ingénieur Conseil's **code of ethics** is a structuring element in our method of operating and enlightens the principles that drive us. It defines the rules of individual and collective conduct which must guide our actions and inspire our daily choices in accordance with our values and commitments. This simple and concise document shows the areas where we are vigilant as well as our commitments in business conduct. This code is intended for Antea Group teams, as well as its partners, suppliers, and subcontractors.

The constant application of this code and its operating commitments allow us to be recognized in the market as a company of exemplary integrity.

In order to ensure perfect knowledge of these rules and their application by all of our employees, we prepared an e-learning training and evaluation course dedicated to the code of ethics. 733 employees successfully completed this training in 2021. An assessment will be done in 2022 as part of the review of our anti-corruption system. We also completed our risk analysis and developed a specific action plan which will be deployed in 2022. It includes in particular an evaluation of third parties (clients, suppliers, partners, etc.).

Our Ethics Officer ([ethique@anteagroup.fr](mailto:ethique@anteagroup.fr)) is available to everyone to answer all questions relating to the fight against corruption, influence peddling, unlawful agreements, favoritism, and conflicts of interest.



In the code of ethics, we set out four commitments:

- 01 We refuse all forms of corruption or influence peddling;
- 02 We give our opinions as engineers & consultants in compliance with professional codes of conduct;
- 03 We reject unlawful agreements and favoritism;
- 04 We are vigilant in preventing conflict-of-interest situations.

# 2



## Principle 3

Respect freedom of association and recognize the right to collective bargaining

## Principle 4

Contribute to the elimination of all forms of forced or compulsory labor

## Principle 5

Contribute to the effective abolition of child labor

## Principle 6

Contribute to the elimination of all discrimination in employment and professions

## Working conditions: diversity, health, safety



Find the description of the SDGs on pages 70/71

Our employees are at the heart of our ESG approach. It applies to working conditions, the fight against discrimination, social dialogue, human capital development, diversity, health, and safety at work.

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# 2.1

## Diversity and non-discrimination

In France, Antea Group has a rich history, with roots dating back to the 1950s. Today, Antea Group is an international environmental engineering and consulting company, with more than 3,200 employees worldwide, and a parent company in the Netherlands.

In France, Antea Group is made up of two legal entities: Antea France and its subsidiary IRH Ingénieur Conseil. Antea Group brings together multidisciplinary experts and consultants working in the fields of the environment, water, infrastructure, and environmental data management. Our French teams, made up of more than 880 employees and spread over 26 offices in metropolitan France and 5 in French overseas departments, work in the heart of territories alongside local stakeholders in France and internationally.

At Antea Group, we strongly believe in diversity. This is why we are implementing various actions aimed at promoting women, young people, and seniors in the company.

### Gender equality

Our Gender Equality indexes reflect our daily actions to maintain **overall scores above 75/100** (objective mentioned by the French Law No. 2018-771 of September 5, 2018, in order to combat gender inequality).

#### Gender Equality Index



**77**  
Antea France

**79**

IRH Ingénieur Conseil

#### Workforce at the end of 2021



**634**  
Antea France

**246**

IRH Ingénieur Conseil



Beyond these indexes, our first ChooseMyCompany HappyIndex® AtWork survey carried out in September 2021 among all employees (see details on page 20) put us in the TOP25 of companies with more than 500 employees where women are the happiest and most engaged out of a total of 985 companies that took part in the same survey.

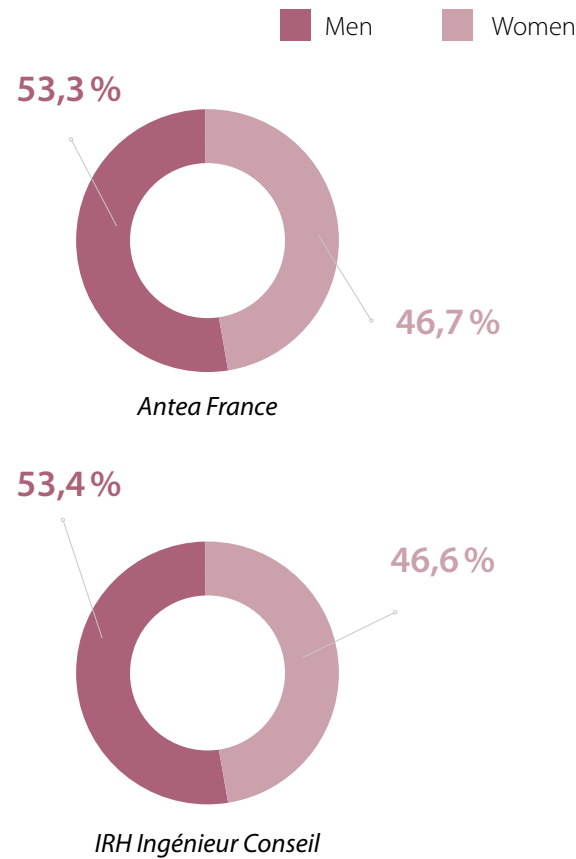
Since 2021, we have been participating in the #IngéEgalité campaign launched by Syntec Ingénierie on social media to promote engineering careers to young female high school pupils and students.

### Disability support

In 2021, a disability contact was appointed and trained to help us better manage disability inclusion within the company.



MEN/WOMEN WORKFORCE RATIO



Our recruitment reflects our commitment to gender parity:

	2020	2021
New recruits	95	134
Young recruits* among new recruits	46 of which 48 % are women	58 of which 50 % are women
Work-study contracts	16 of which 44 % are women	24 of which 54 % are women
Interns	77 of which 48 % are women	133 of which 47 % are women

\* Young recruits: graduates leaving educational institutions without initial professional experience excluding internships and work-study contracts





Integration and support for young people

**Antea Group continues to mobilize for the professional integration of young people.** In 2021, we hired on permanent contracts 50 interns and work-study students at the end of their contracts. The proportion of young graduates in our recruitment reached 43% in 2021 (see indicators on the previous page).

In order to make our jobs and our values more accessible, we have given our young employees a voice via the Welcome to the Jungle platform. Since 2021, Antea Group has had a showcase site on it that gives better visibility of our corporate culture and our job offers to candidates.

In addition to the support offered on a daily basis, in 2021 we launched our digital integration course. It enables our new employees to follow presentation modules about our organization, our jobs and our tools at their own pace. Thanks to this course, newcomers can more easily and quickly discover the company culture and integrate, beyond exchanges with colleagues, the manager, and the sponsor.



www.welcometothejungle.com/fr/companies/antea-group-france

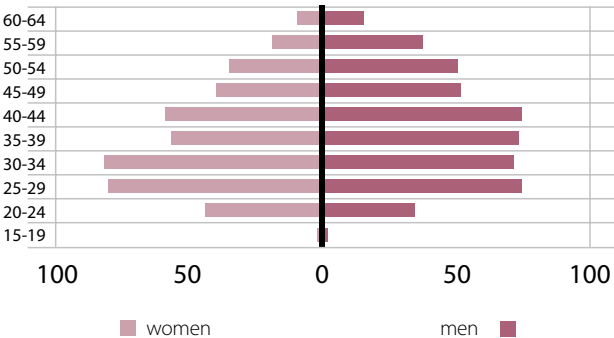
We are continuing our partnership with the NQT association initiated in 2017.

The objective of the association, formerly called ‘Nos quartiers ont du talent’ (Our communities have talent) is to create bridges and forge special links between the business world and the young graduates that are furthest from being employed. Professional sponsorship or mentoring is based on commitments between a working executive and a young graduate. By giving a few hours of their time, the employee changes the course of a young graduate’s life by coaching him/her personally in his/her job searches, work-study programs or in their business creation project.

In 2021, 6 Antea Group employees signed up as mentors to help young graduates from priority neighborhoods or from low-income backgrounds to find employment. In 2022, an internal communications campaign is planned to make the association and this partnership better known to new employees.

Find out more about the NQT association: [www.nqt.fr](http://www.nqt.fr)

Age structure



Antea Group France



Actions with seniors

In 2021, we implemented actions aimed at better informing our future retirees of their rights, and about possible support in terms of flexible working hours and training. Specific training dedicated to preparing for retirement has been offered. In 2021, the first 5 employees took advantage of this.



Fight against sexual harassment and sexist conduct

In 2021, actions to raise employee awareness were carried out in order to combat and prevent any sexual harassment and sexist conduct in the workplace. A first communication initiative was addressed to all employees on the day promoting non-violence, which made it possible in particular to remind employees whom they can contact internally and externally.



Cohesion, health, and well-being at work

In 2021, cohesion remained a key issue, in particular due to the waves of COVID-19, the resulting restrictions, and their impact on our teams (sick leave, isolation, etc.).

Emphasis has been put on internal communication, in order to maintain the feeling of belonging and to share the company’s wealth of news.

Our Managing Director Pascal Voyeau continued the regular broadcast of informative videos that had been initiated in 2020, with the objective of direct communication with employees from the whole country. Since September 2021, internal newsletters have been published monthly for better circulation of news, including an exhaustive presentation of new arrivals.

In July, a social event was organized simultaneously at all Antea Group sites in France to encourage reunions between colleagues after the various health restrictions. On this occasion, the new recruits who have arrived since the first lockdown were the guests of honor.



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Internal videos with informative messages from the Managing Director sent directly to all employees in 2021





In 2021, we continued to manage the health crisis in close collaboration with our employee representatives and to sign agreements enabling us to adapt our operating methods to changing health restrictions.

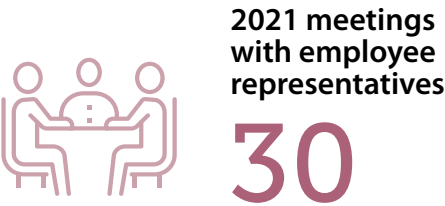
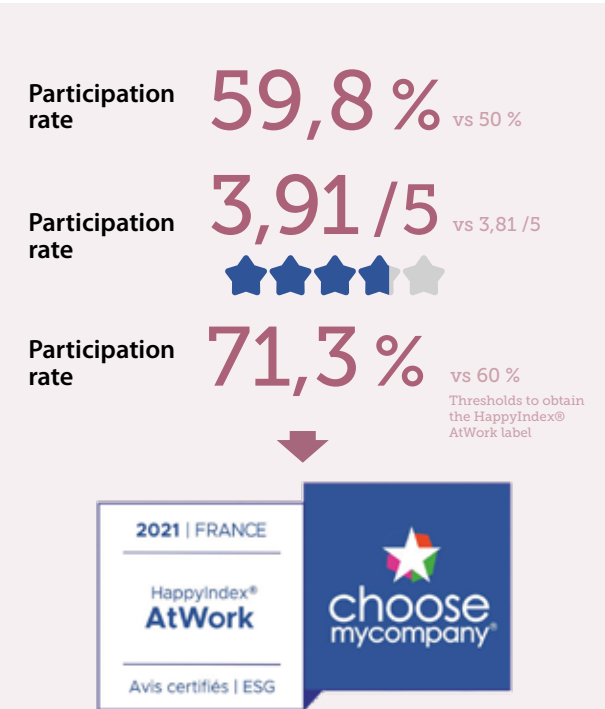
### Motivation and commitment of our teams

ChooseMyCompany's **HappyIndex® AtWork** survey looks into the motivation and commitment of our teams.

Based on six themes - professional development, management, pride, work environment, salary and recognition, pleasure - it allows employees to express their feelings and what is important to them at work. It highlights the reality of their lived experience.

Thanks to a good participation rate and the results obtained during the survey carried out in September 2021 among all employees, we were able to obtain in the first year the **HappyIndex® AtWork** label awarded to the most exemplary companies in terms of well-being at work. It also helped identify priority actions to continue to progress in terms of the motivation and management of our employees.

#### ChooseMyCompany survey: 2021 Antea Group results



### JOIN young employee network

We involve our young employees in the life of the company. Created in 2019, the JOIN network aims to bring together employees under the age of 30 in order to meet, get to know each other, learn, have fun and contribute through their actions to the well-being of all Group employees. The team is also part of the international JOIN network, with Antea Group counterparts in the Netherlands and Belgium.

In 2021, Join launched Antea Group's participation in the « Au boulot à vélo » challenge, organized by the CADR67 in partnership with the Eurometropolis of Strasbourg. This event aims to encourage the use of bicycles on commuting and work journeys. The initiative stimulated competition between our different sites in France and created opportunities for discussion. Our 212 participants can be proud of the efforts made as we finished first in the private companies category with more than 500 employees (see more details on page 35).



### Continued support in the Covid context

The year 2021 was not the year when COVID ended, but we have learned to live «with it» by adapting our company life to the changing health situation. When the virus was circulating to a limited extent, and the rules allowed it to be done safely, we favored cohesion actions such as the resumption of face-to-face training and team lunches. Great care was paid to the well-being of our employees during each period of restrictions: during individual interviews with their managers, everyone was able to decide on the remote working/office ratio that suited them best. Our regional offices remained open: when the health situation required it, monitoring of the maximum number of employees in the offices, with prior registration, made it possible to avoid any spread of the virus within the company while leaving employees to choose the remote working/office balance that suited them best.

Our active support platform, set up in 2018, is always promoted and recommended by management, peers and human resources when the slightest issue is detected.

### Remote working and part-time work: organizational flexibility

In order to facilitate a better work-life balance, Antea Group offers a range of part-time formulas as well as the possibility of remote working thanks to our company agreements.

Since gradually coming out of the health crisis, employees have continued to request remote working at a pace adapted to their personal organization.



\*excluding occasional remote working: occasional remote working is an ad hoc arrangement of remote working. It can be set up on a case-by-case basis, subject to the prior signing of an amendment to the employment contract, to meet a particular and temporary need or in order to deal with unusual, unforeseeable, and one-off situations.  
\*\* excluding health restriction periods





## 2.3 Safety

### Our Health, Safety, Quality and Environment Management System

Our national HSQE policy is based on the following 5 essential commitments:

- 01 To provide high-level technical services with real added value for our clients**
- 02 To comply with our commitments in terms of deadlines**
- 03 To work on the development of innovative solutions, both from a technical and organizational point of view**

- 04 To improve the quality of life at work for our teams**
- 05 To be a responsible and exemplary company in terms of ethics, quality, health, safety and environmental protection**

To deploy this policy, improve our overall performances and provide a solid basis for initiatives that will ensure our development and sustainability, we have chosen to rely on an integrated Health, Safety, Quality and Environment (HSQE) management system which, depending on our activities, complies with the following standards:



he OPQIBI qualifications (Engineering Qualification Body) validate the expertise and the experience of our engineers. We have about sixty qualifications, including several with the Reconnu Garant de l'Environnement label (Recognized Guarantor of the Environment), which highlights activities promoting renewable energies.



MASE is the standard among industrial stakeholders for the health and safety management of stakeholder personnel as well as their management of environmental impacts.

#### LNE SSP

The LNE SSP certification (National Laboratory of Metrology and Testing Polluted Soils and Sites) based on the NFX 31-620 standards judges the quality and conformity of services relating to polluted sites and soils. The areas cover diagnoses, decontamination engineering including pilots and remediation works, as well as regulatory certificates.

#### COFRAC

The Measurements Business Unit of IRH Ingénieur Conseil is accredited by Cofrac for part of its services:

- water and air emission sampling, measurement and control,
- control of occupational exposure to chemical agents in the workplace.

Cofrac Test Accreditations, no. 1-1767, 1-2460, 1-2461, 1-2462 and 1-2476, list of sites and scopes available on [www.cofrac.fr](http://www.cofrac.fr)



The CEFRI-E certification reference system specifies the organizational arrangements to be adopted by companies employing category A or B personnel working in nuclear installations.



Antea France is registered by DIRECCTE Ile de France (Labor Division, Occupational Health and Safety Department) for the Environment team which acts as occupational risk prevention advisor for clients in the industrial and office real estate sectors.

#### Dikes and Dams accreditation

Antea France has the Dikes and Dams accreditation issued by the Ministry of Ecological and Solidarity Transition, for our ability to carry out studies, surveys as well as monitoring of works relating to the safety of hydraulic structures as well as class C dams and dikes.



Senior Management has always stated its commitment to implementing a high-performance HSQE culture and system, shared by all and at all levels. For the Management of Antea Group, health and safety at work must be part of a preventive approach involving the company and the employee:

- A **recognized HSQE system since 2006** – in the past, certifications were requested and obtained by each regional site. Antea France has now chosen to commit to a **single national MASE certificate**, covering its 4 business lines. This new nationwide certification strengthens our collective operation by deploying a common HSQE culture across all our business lines.

- **A recognized commitment:** participation in the UPDS\*Health & Safety Committee
- An HSQE system based on everyone’s contributions: **436 HSQE reports in 2021**
- An HSE network of **5 business coordinators and 31 local correspondents**
- **305 HSQE events** (discussion meetings on a given HSQE topic, Health Safety awareness-raising communications or HSQE news flashes)

- **Risks managed** with low rates of accidents:

*\* Union of Site Decontamination Professionals*

		2021	2019 Profession rate
Antea France	Frequency rate	3,80	4,10
	Severity rate	0,02	0,20
IRH Ingénieur Conseil	Frequency rate	5,04	4,10
	Severity rate	0,11	0,20

*Frequency rate: number of accidents with work stoppage of more than one day, per million working hours  
Severity rate: number of days compensated for, for 1,000 hours worked*

- Awareness of road risks (main risk in our Single Professional Risk Assessment Document): a national discussion organized over 1 week and bringing together 490 employees on the subject of road risk, maintenance of training for young drivers, regular awareness-raising campaigns in our offices, prevention activities, provision of new service vehicles (<4 years) fitted with Safety options (Bluetooth, accident safety kit, fire extinguishers, antipollution kit for certain activities).
- RSI (repetitive strain injuries): maintenance of training in movements and postures specific to each job (e.g.: plate lifting training for water-related jobs), purchase of material to help with handling, on-site awareness-raising events.
- Employee exposure monitoring:
  - Increase in-situ exposure measurement campaigns;
  - Updating of the monitoring methodology to confront recurring omissions in the field by employees;
  - Final configuration of our exposure monitoring tool to better adapt it to our needs;
  - Potential presence of asbestos - maintenance of procedures aimed at reducing the dispersal of dust when drilling slabs or asphalt.



#### Initial first-aid training

28 people  
448 hours

#### First-aid training/retraining

77 people  
616 hours

### Continued actions concerning Safety and Health

2021 was an opportunity to strengthen our shared culture around Safety and Health. The collective vigilance of all and respect for our provisions in terms of Occupational Safety and Health helped achieve our commitments and objectives in terms of Safety and Health:

- Maintenance and adaptation of our Business Continuity Plan linked to the COVID context.
- Updating of our HSE instructions and operating methods to integrate the various changes in government rules related to the COVID health context.
- Updating of the Single Professional Risk Assessment Document for integration of COVID topics and remote working.
- Adaptation of our HSQE discussion/event formats - Organization of national talks on cross-disciplinary subjects (see below).
- Maintenance of the Safety and Health culture thanks to a HSQE network always deployed as close as possible to employees (branch correspondents, business coordinators, HSQE delegation, and technical department).
- Reinforcement of precautionary measures where there are dangerous situations that may be encountered regularly in the context of our professions (lone worker, work at height, in confined spaces, chemical risk, etc.).

- Maintenance of collective training actions; in accordance with the LNE obligation, and despite the health context, 100% of the staff in our Environment Business Department are first aiders.
- Development of good HSE practices with regular participation in UPDS working groups on ‘monitoring the chemical exposure of workers in Polluted Sites and Soils’.



### A year marked by the COVID-19 pandemic

**The COVID-19 pandemic** has brought about many changes that we have all had to deal with. Our crisis unit set up in February 2020 has continued to be active and reactive in 2021, as soon as the health situation required it. This coordination has been possible thanks to the following dedicated organization.

- A)** The France HSQE Manager acts as the national COVID contact. She is assisted to do this by:
  - a Health & Safety contact, for monitoring personal protection equipment and general supplies necessary to comply with health recommendations, as well as for setting up awareness-raising materials (internal displays and awareness-raising/welcoming new employees with safety training);
  - HSQE facilitators - COVID business contacts - in particular in charge of providing support to project teams for the development of Risk Analysis Sheets specific to each intervention;
  - the site managers - COVID site contacts - for the safety and hygiene of our permanent premises and compliance with HSE instructions within them.

Any employee can get in touch with these people to obtain additional information on the measures to be complied with for taking into account the COVID-19 risk in their activities or to report a proposal for improvement or a difficulty in implementation.

**B)** A COVID-19 monitoring committee, whose members include

- *the Managing Director*
- *the Human Resources Director*
- *the Sites Director*
- *the France Technical Director*
- *the HSQE Manager*
- *a representative of the Hygiene, Safety and Working Conditions Committee of each Social and Economic Committee*

This committee is responsible for monitoring the effectiveness of the measures implemented, analyzing reports and feedback from the teams and developing procedures as required. **In 2021, it met 38 times.**

**C)** Internal communication is provided by Senior Management on a regular basis, to clarify the evolution of the situation and the organization of work within the company.

**D)** A psychological helpline and support unit are also in place (see page 21).

*Thanks to this entire system and to good compliance with social distancing and health recommendations, our 31 sites across metropolitan France and in the overseas departments have not been subject to any contamination outbreak.*





Find the description of the SDGs on pages 70/71



## Principle 7

Apply a precautionary approach to environmental issues

## Principle 8

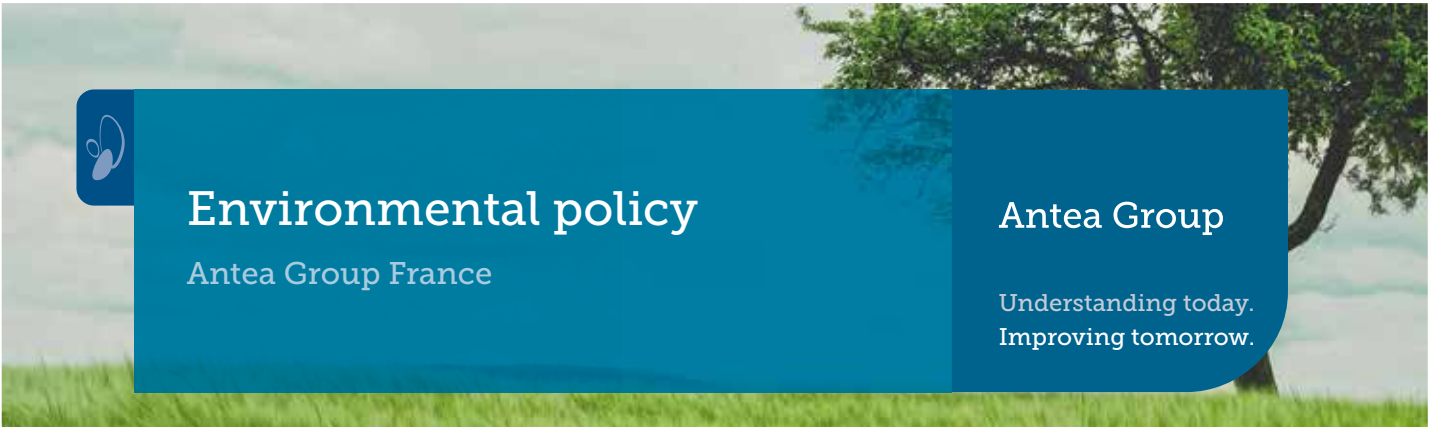
Take initiatives to promote greater environmental responsibility

Our environmental commitments are led by all the women and men working within Antea Group. We are therefore motivated and driven to work every day to improve our performance in this area.

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## Our environmental commitments in the operation of the company





The coming decade is decisive for controlling global warming. The Paris Agreement of the COP 21 explicitly states that a clear reduction in greenhouse gases (GHGs) must occur by 2030. We want to reflect this conviction in our engineering projects but also in our daily working practices.

Our adhesion to the United Nations Global Compact program has enabled us to initiate our first commitments in terms of sustainable development. Our Ecovadis Silver Medal for the Environmental, Social and Governance (ESG) performance of Antea Group France confirms that we already have the keys to advance in the right direction for the company, for the employees, partners and clients.

We wanted to continue our commitment to sustainable development by signing the Syntec Ingénierie "Climate Charter". We are therefore committed to being proactive in our missions and projects to reduce their carbon footprint, as well as to adopting sustainable low-carbon practices that are efficient from the point of view of resources and the environment in general.

In 2021, we are renewing our commitments made in 2020 by:

- Reducing the impact of travel related to the company's activity;
- Changing day-to-day habits at work;
- Controlling the company's carbon footprint

We can and want to be proactive in helping our clients improve the environmental quality of their projects and minimize GHG emissions. This commitment is an integral part of our company plan.

For more information

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### 3.1

## Our 2021 environmental policy

*Each year, we consider new ideas to strengthen our environmental policy. The commitments we make are based on extensive in-house consultation and with our partners to mobilize as many as possible in areas for improvement. Better knowledge of our operating, our work practices and their impacts on the environment has made it possible to develop an action plan leading us to more virtuous behavior and control of our carbon footprint.*

### The 'Engineering for the Climate' Charter



Syntec-Ingénierie has offered all of its member companies the opportunity to sign up to the 'Engineering for the Climate' Charter, thus fulfilling their daily commitment to the climate. Through this charter, the signatories undertake to:

- Be proactive in the missions and projects they carry out to reduce the carbon footprint.
- Sustainably adopt low-carbon practices in house and reduce their own greenhouse gas emissions..

Antea Group has been a signatory of this charter since 2019: <https://www.syntec-ingenierie.fr/charte-climat/>

In 2021, we focused our actions around three major commitments:

- To reduce the impact of travel related to the company's activity;
- To change day-to-day habits at work;
- To control the company's carbon footprint.



3.2

Survey of  
our environmental  
practices

If carrying out a Bilan Carbone® is an essential stage in knowing your activity's emissions, it is in no way the end of the matter!



Antea Group Bilan Carbone®  
(carbon footprint)

Aware of the need to reduce our carbon footprint to tackle climate change, our Management has included in the corporate project of Antea Group the objective of reducing GHG emissions both in its engineering missions and in its daily practices.

The businesses of Antea Group are resolutely focused on respect and protection of the environment, decontamination, and the sustainable use of natural resources. We therefore wanted to go beyond our regulatory obligation of carrying out a Greenhouse Gas Emissions Assessment. We are committed to carrying out a Bilan Carbone® (carbon footprint audit). This more comprehensive approach to accounting for and reducing greenhouse gas emissions takes into account both so-called "direct" and "indirect" emissions (scopes 1, 2 and 3).

Implementation  
of our action plan

Antea Group is a committed stakeholder in the fight against global warming. We have chosen to adapt our actions to the National Low-Carbon Strategy. We signed up to a voluntary approach to reducing our CO2 emissions, with the aim of achieving carbon neutrality by 2050. Therefore, we have developed a committed action plan to reduce our emissions over 4 years (2020-2023).

The actions are classified by major themes:

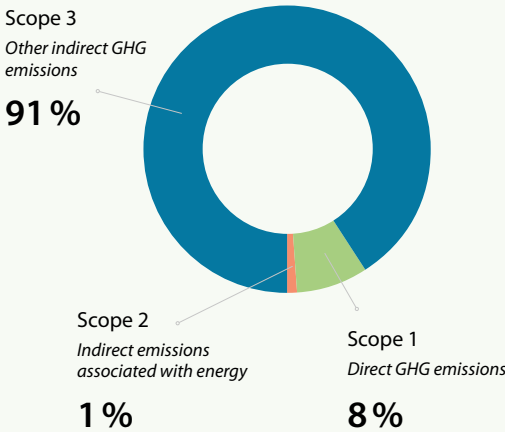
- energy,
- travel,
- waste,
- inputs and fixed assets.

Overall result of our 2019  
Bilan Carbone® (carbon footprint)

12 054

tons of CO<sub>2</sub> equivalent

Distribution of emissions  
by scope



Our CO<sub>2</sub> emission reduction targets over 4 years for each of these themes (see below\*) were calculated based on the consumption specific to each item in the operation of the company. From 2024, a new Bilan Carbone® will have to be carried out in order to adjust our action plan and our targets.

The 'inputs and fixed assets' item is crucial in reducing our emissions. It represents 67% of our carbon impact. Efforts focus on our IT stock and the selection of our suppliers.

Theme	Objective of the approach	Recommendations
Inputs & Fixed assets (Scope 3)	Reduce fixed assets	Increase in the amortization period of 100% of the IT stock from 3 to 4 years
	Optimize purchases of goods and services	Questioning and evaluating suppliers and service providers on their carbon impact with the aim of getting them to change it, and potentially entering into partnerships with more virtuous service providers

The 'Energy' item ranks second in our Bilan Carbone®. Indeed, our territorial presence and the size of our car fleet explain the company's carbon impact on this item, mainly related to travel between our offices and on our project sites. Our action plan emphasizes on improvements in terms of behavior (eco-gestures, eco-driving, etc.) and investment (more economical and sustainable equipment, etc.).

Theme	Objective of the approach		Recommendations
Energy (Scopes 1, 2 et 3)	Reduce consumption	Behavior/ Investment	Car Charter Improvement
		Functioning	Raising employee awareness of eco-gestures Launch of an intra-branch challenge aimed at reducing energy consumption (10%) Organization of training/awareness on responsible digital technology Training in eco-driving of 20 drivers among those that drive the most each year
		Behavior	LED relamping of all offices that are not equipped yet Use of high-performance tires Stock optimization



Reduction target\*

Inputs & Fixed Assets

-813 tons of CO<sub>2</sub> equivalent



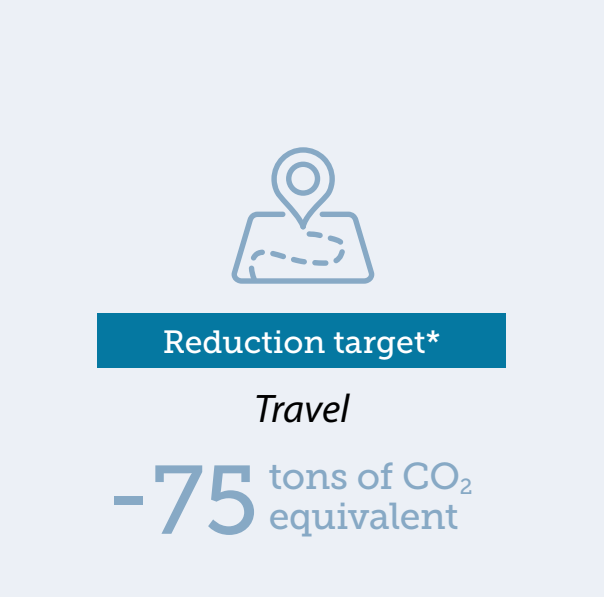
Reduction target\*

Energy

-316 tons of CO<sub>2</sub> equivalent

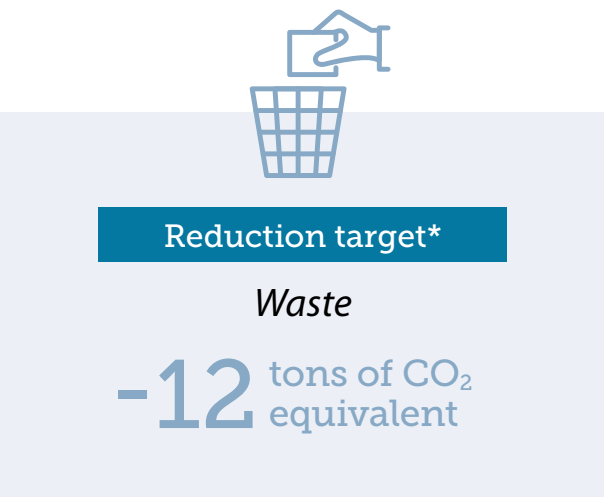


Our 'Travel' habits represent our third largest source of emissions. In this area, progress is sought in terms of reducing travel and moving towards more eco-responsible modes of transport.



Theme	Objective of the approach		Recommendations
Travel (Scope 3)	Reduce consumption	Behavior/ Investment	Implementation of a mobility plan (promotion of cycling, encouragement to use public transport, incentive to carpool, etc.)
		Functioning	Implementation of remote working
		Behavior	Replacement of flights by train journeys

Waste represents less than 1% of our carbon footprint. However, as an engineering company specialized in environmental management, we must adopt exemplary behavior in the management of our waste. This is why actions in our plan target improving our actions in sorting and recycling our waste.



Theme	Objective of the approach		Recommendations
Déchets (Scope 3)	Reduce, sort, recycle	Reduce	Offering a stainless steel water bottle to 100% of new recruits
		Sort	Implementation of a "5 stream" sorting system in 100% of office sites
		Recycle	Implementation of recycling of PPE (Personal Protective Equipment)



Antea Group is taking the necessary steps to achieve its ambitions in the fight against global warming by implementing an effective short- and medium-term action plan that involves all of the company's stakeholders.

### 3.3

## Progress made in 2021 in our practices

*The health crisis context enabled us to accelerate the implementation of our Bilan Carbone® action plan.*

*Thus, initiatives such as remote working and the recycling of certain waste (masks, mobile phones, etc.) were launched straight away.*

### Optimizing the sorting system in our offices

In the context of the health crisis, we wanted as early as 2020 to very quickly limit waste by providing each employee with washable masks (3,800 masks distributed nationally). As soon as the government rules evolved, it seemed obvious to us to set up recycling of surgical masks. We chose to go through a service provider that recycles all of our PPE, namely:

- Disposable protective and dust masks,
- Hair and beard nets,
- Ear plugs,
- Disposable gloves and safety glasses,
- Disposable protective clothing and overshoes, and other single-use protective clothing,
- Helmets.

We also wanted to make it easier for our employees to sort waste at source on a daily basis.

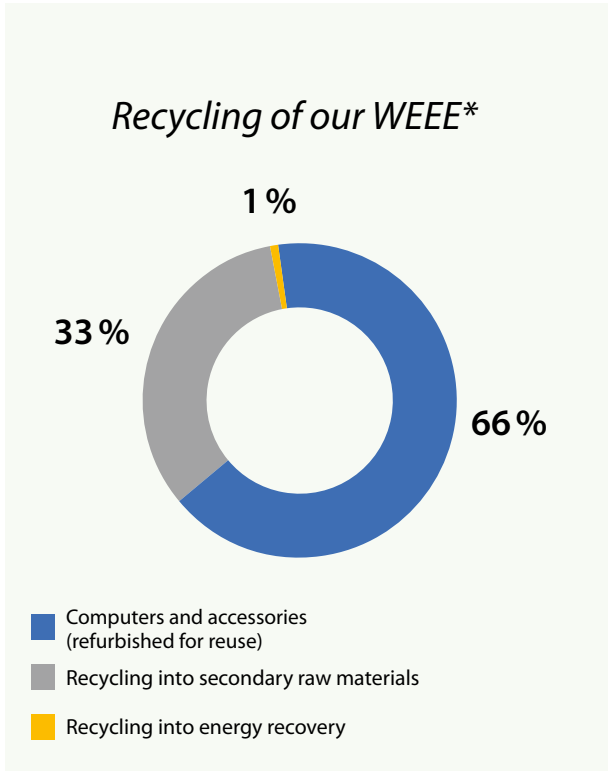
A framework agreement was therefore signed in November 2021 in order to effectively ensure the regulatory 5-stream sorting scheme on all of our sites.



### WEEE recycling

**Our IT department collects the waste electrical and electronic equipment (WEEE) from all our agencies.**

Since July 2019, our provider NORIP has recycled waste generated by the economic activity of administrations, local authorities, and companies in Loiret (department where our head office and our IT department are located) in a circular economy approach: re-employment, repair and reuse are systematically favored.



\* WEEE: Waste electrical and electronic equipment



### Mobile phones

Since September 2019, Betoobe has been our service provider for managing our phone stock. It provides a wide range of services that meet our needs: stock management support, the deployment of terminals, but also, and above all, repairs and troubleshooting, return and recycling, which make it possible to prolong the lifespan of mobile phones.

**In 2021, as in 2020, less than 10% of the stock terminals suffered a technical failure.**

- In the event of a failure, a terminal can be repaired, recycled, or covered under warranty by the manufacturer.

	2020	2021
Repair rate	75 %	79 %
Recycled	15 %	20 %
Covered under warranty by the manufacturer	10 %	1 %

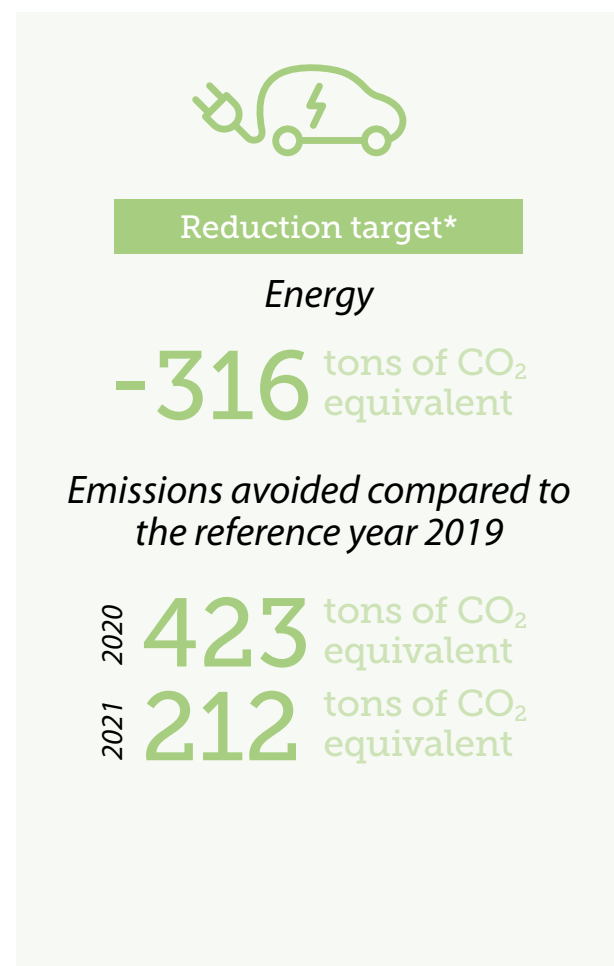
Management of our malfunctioning telephone terminals

### Responsible digital awareness

One of the actions implemented in 2021 concerned responsible digital awareness of employees. It is indeed difficult for each of us to visualize the impact of digital technology on our energy consumption. However, in our business lines, digital is our leading working tool. An initial awareness-raising campaign was undertaken in 2021 and will continue in 2022.

### Reduction of our fuel consumption

The reduction in business travel caused by the health crisis significantly reduced our emissions due to fuel consumption over the last two years.



### Progress as regards travel

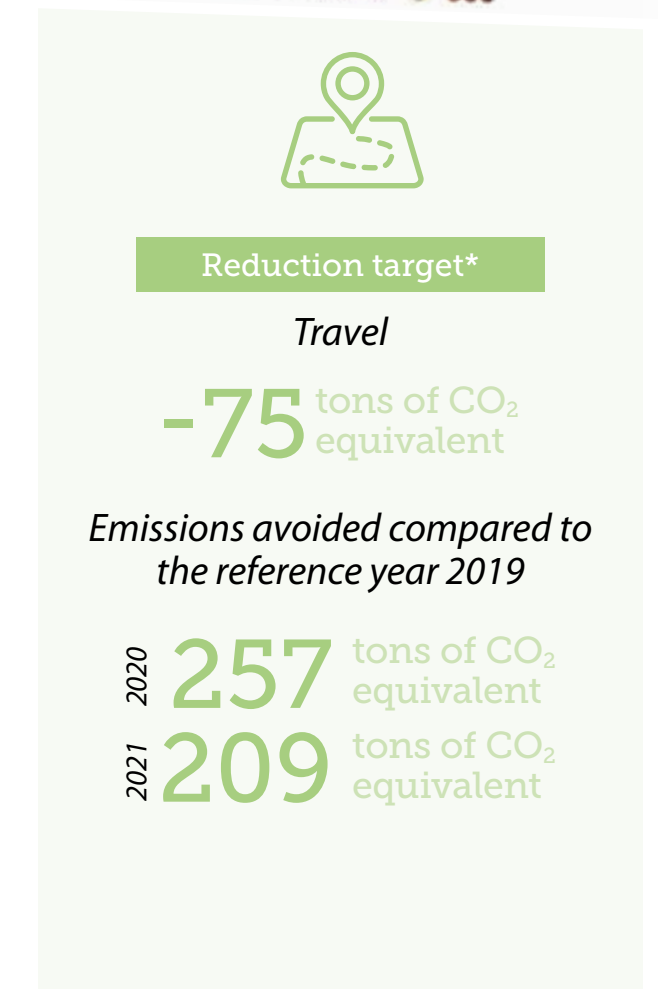
In 2021, Antea Group participated in the 'Au boulot à vélo' (cycling to work) challenge, organized by the CADR67 in partnership with the Eurometropolis of Strasbourg. This event aims to encourage the use of bicycles on commutes and work journeys.

In total, 212 Antea Group employees decided to cycle and traveled no less than 25,594 km over the course of June. These commutes by bicycle made it possible to avoid the emission of 3.8 tons of CO<sub>2</sub> equivalent.

Remote working, which has been widely adopted since the start of the health crisis, has had an obvious impact on reducing our travel-related emissions. Many of our employees have become accustomed to this new way of working and have adopted it by signing a remote working amendment to their employment contract as suggested by the company (see page 21).

Thus, our goals for reducing commuting were largely exceeded in 2020 and 2021.

Efforts will be made to ensure this trend continues.





## 3.4 Responsible purchasing

*Antea Group is committed to the three constituent dimensions of sustainable consumption:*



### Buy better

We include in our specifications and our contracts for the supply of goods and services clauses relating to the restriction of environmental impacts, respect for human rights, and the creation of value for all stakeholders.

When purchasing goods – office supplies, building materials, furniture – we promote the use of recycled products and recyclables from short channels, with low environmental impact, as well as products and services which are part of a circular economy approach, etc.

Solidarity purchasing is also an important part of Antea Group's responsible purchasing policy. In 2021, we initiated a process to identify our suppliers from programs such as "integration through economic activity of people who are furthest from being employed" and the "protected and adapted sector" such as Adapted companies (EA) as well as Work Support Establishments and Services (ESAT). This approach facilitates the professional integration of people who are struggling to get work and/or have a disability.

When purchasing services, we include the review of ESG indicators in the analysis of proposals submitted to us and in the selection process of our suppliers. These, as well as the operational implementation of the commitments made, are monitored for the duration of contracts and taken into account in the process of evaluating our suppliers.

We take care not to put our suppliers in a situation where they are economically dependent.



### Consume better

We promote feedback and capitalizing on individual and collective best practices in terms of saving resources, both in the daily lives of our own teams and in the consulting services offered to our clients.

We promote the reuse of goods, particularly furniture, internally or through partnerships with circular economy stakeholders, as well as limiting the use of single-use equipment in our daily actions.

At some of our sites, spaces for recycling books and toys have been made available to employees.

Other actions are in the project phase, such as the use of printers fitted with devices to limit the production of orphan copies or even the establishment of a catalogue of eco-responsible office supplies.

We also carry out actions within the framework of our projects, by imposing on our suppliers the deployment of operational solutions in terms of health, safety and the environment and support them in the appropriation of these initiatives.



### Dispose better

We value the transition from possession to usage by going beyond the purchase of goods and by integrating the end of life of products into our daily practices.

We implement systems at our sites that promote the reduction and recovery of waste, such as the provision of washable and reusable crockery, and sorting bins.



## Examples of concrete actions

### Choice of a national network for the management of a 5-stream waste sorting scheme to contribute to local development

The selected service provider has developed its sites throughout France by signing franchise agreements with local entities, employment reintegration companies or disability-friendly companies wishing to deploy the activity in their region and sharing the same objectives and values.

The creation of these new sites is also coherent with our desire to favor local development. Firmly established close to its clients and partners, each of the service provider's sites thus actively contributes to creating a circular economy that guarantees industrial development and the creation of jobs in the regions.

### Limiting the environmental impact of our sales materials

In 2021, our 2020 ESG report was printed in a limited number of copies, on 100% recycled paper.

For the production of our booth at the Pollutec trade show in October 2021, we chose eco-responsible solutions: reusable carpentry, low-consumption electricity, Imprim'vert-certified printouts, and furniture made from recycled materials.

### Analysis of needs to minimize their impact

To promote short channels and minimize the carbon footprint of our purchases, we prioritize suppliers who relocate production to France. This is why in 2021 the first stainless steel water bottles made in France entered our company. As this model is currently available only with a capacity of 500 ml, it is offered to employees who travel very little.

Thus, more than half of the water bottles we order are made in France. The other water bottles, with larger volumes, are intended for people who are often on project sites. We ensure that our suppliers scrupulously comply with ethical conditions.





## Principle 9

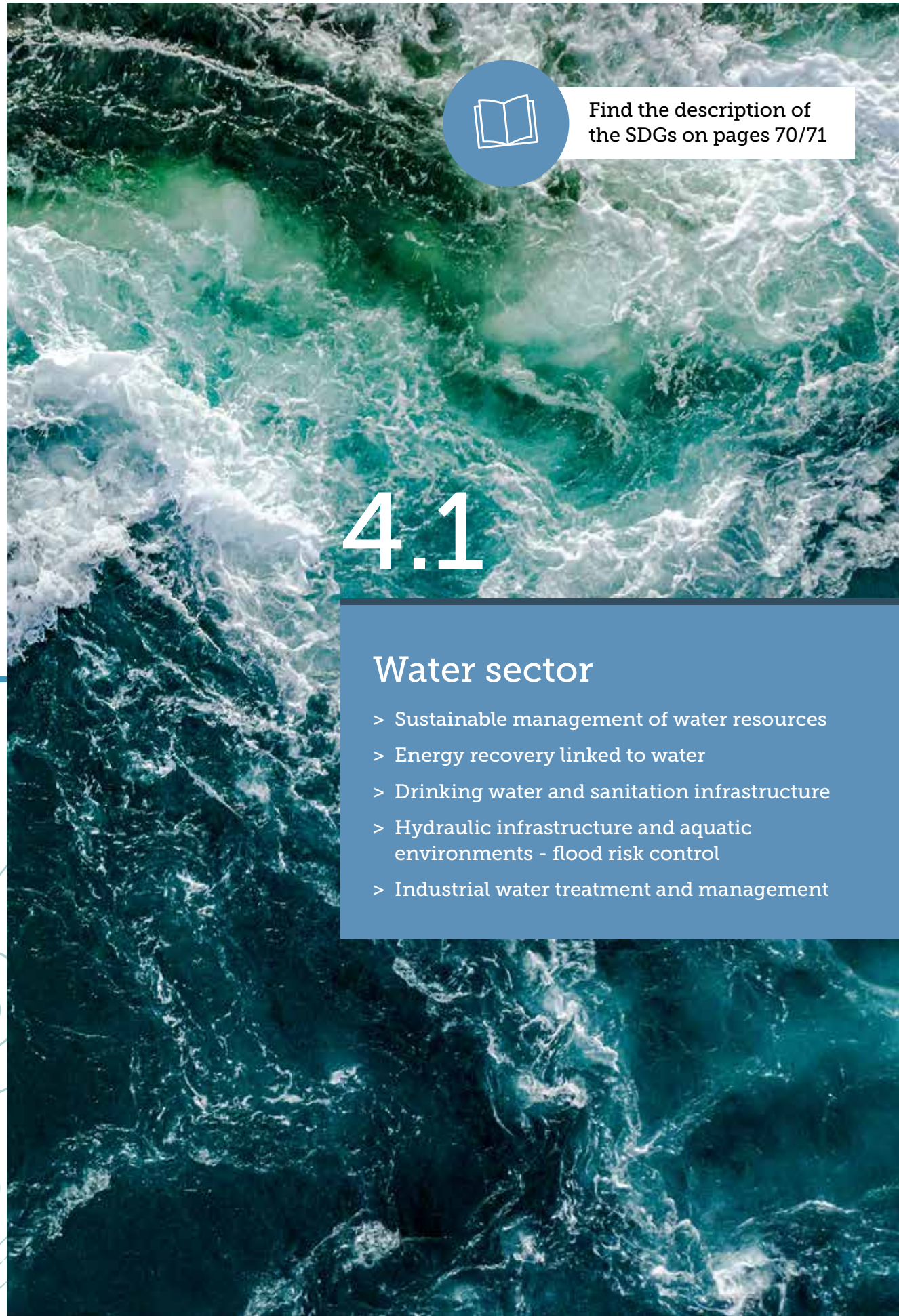
Promote the development and dissemination of environmentally friendly technologies

## Contributions of our activities to the Sustainable Development Goals (SDGs)

*Our reaffirmed desire to improve the company's environmental performance is also expressed daily in the environmental management of our projects for better consideration of the SDGs. Continuous improvement of our environmental engineering meets the needs of our clients, their ambition to control the environmental footprint of their projects, in a national or international context that is increasingly demanding in terms of sustainable development.*

Water sector	40
Environment sector	46
Infrastructure sector	54
Measurement and environmental data management sectors	60
Research & Development - Innovation Scientific and teaching activities	66





Find the description of the SDGs on pages 70/71

# 4.1

## Water sector

- > Sustainable management of water resources
- > Energy recovery linked to water
- > Drinking water and sanitation infrastructure
- > Hydraulic infrastructure and aquatic environments - flood risk control
- > Industrial water treatment and management

## Sustainable management of water resources



Water has become a major concern, and climate change is only increasing the pressure on water resources. In France, the SDAGEs (Master Plans for Water Development and Management) applicable to major river basins, and the SAGEs (Plans for Water Development and Management at a more local level), are planning tools for balanced management of water resources. We support water management stakeholders to define these major focuses, the water quality and quantity objectives, and the actions necessary to ensure the protection of the water condition and of aquatic

environments. In France and internationally, Integrated Water Resources Management (IWRM) relies on consultation between stakeholders in a given territory in order to reconcile the requirements of different uses: drinking water, agriculture, industry, leisure, etc., while preserving aquatic environments. Our hydrogeologists work together with our geomatics specialists and data scientists to also support these projects using mapping, databases, online platforms, modeling and other digital services.



21 %

of the national territory covered by our integrated management services in 2021



8.4 million

inhabitants affected by our integrated management operations in 2021



4 791

municipalities concerned by our integrated management operations in 2021



## Examples of 2021 projects



### Prospective study on the Vienne basin water resources

Climate change affects the water cycle a great deal. To raise general public awareness of the consequences observed on water resources, our engineers have produced for the Local Public Basin Establishment (EPTB) of the city of Vienne a solid knowledge base on past climate as well as hydro-climatic modeling up to 2050. They have thus defined at catchment area level the impacts of climate change and the extent to which needs and the local resources available match up. This study contributes to the integration of adaptation measures in the various local plans and programs.



### Construction of hydro-agricultural structures in Djibouti

Agro-pastoral populations in rural areas are particularly exposed to droughts which increase food insecurity. Their access to water resources is a fundamental issue. As part of the «Support for the resilience of rural populations - Djibouti» project funded by the 11th EDF, Antea Group supervises in the five regions of the country the construction or renovation of 44 hydro-agricultural structures that will enable groundwater recharge as well as the sustainable increase in agricultural production. This project will improve the living conditions of nearly 9,200 households and the activity of more than 1,500 farms.



## Energy recovery linked to water



Energy recovery from the subsoil or water infrastructure contributes to the development of an energy mix favoring renewable sources. Geothermal energy makes it possible to produce heat and/or cool facilities using the heat from the subsoil. With different technologies used depending on the subsoil, it represents a renewable, local and versatile source of energy. Today, it is a high-performance and recognized solution in the context of the energy transition in a given area, for heating, urban cooling, air conditioning or preheating of domestic hot water.

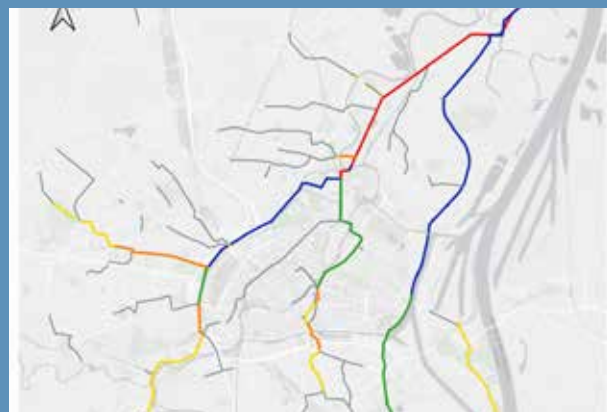
In addition, wastewater treatment plants contain other renewable energy generation methods: recovery of heat from wastewater, production of methanization biogas from sewage sludge and micro-turbining of water flows. Antea Group is involved in all these sectors to define the potential for energy recovery from water at regional level.



**119**  
geothermal projects  
launched in 2021



### Examples of 2021 projects



#### Study of the potential for recovering heat from wastewater in the Eurometropolis of Strasbourg

Wastewater carries thermal energy that can be recovered and used for urban heating. However, too much recovery of heat in the sanitation network can lead to a drop in the temperature of the wastewater and reduce the effectiveness of the biological processes of nitrification and denitrification that are implemented in wastewater treatment plants. Antea Group has mapped the potential for recovering heat from wastewater in the Eurometropolis of Strasbourg by integrating the projected impact on the main wastewater treatment plant in the region: La Wantzenau.



#### Construction of a vertical geothermal probe field in Rungis

As part of the modernization of its thermal energy facilities in the Horticultural Production Center, the City of Paris wanted to integrate renewable energy production in addition to the current gas-powered heating system. It chose the construction of a geothermal probe facility.

The study of the geothermal solution carried out by Antea Group is based on the results of a thermal response test carried out at the project site. Antea Group acted as project manager for this project comprising a heat pump with a thermal power of 250 kW powered by a field of 90 vertical probes covering 9,900 meters.

## Drinking water and sanitation infrastructure



Antea Group is strongly committed to the development of resilient infrastructure for the production and distribution of drinking water, and the collection and purification of wastewater and rainwater. The projects relate to the construction of new infrastructure or the asset management of ageing facilities. A better knowledge of the infrastructure in a given region makes it possible to target actions to improve their performance, guarantee their compliance with regulations, and renew them in certain cases. To do this, Antea Group identifies their deficiencies (water leaks, poor connections to the drinking water/rainwater/wastewater networks, etc.), and organizes their self-monitoring using appropriate instrumentation. Digitization applied to water management allows progress in terms of project management. Antea Group, a pioneer in the management of environmental data, developed software to design context-adjusted strategies and optimization of water-related infrastructure. Internationally, Antea Group mobilizes its expertise on numerous development aid projects that directly

contribute to **'ensuring universal and equitable access to drinking water, at an affordable cost, and ensuring access for all, under equitable conditions, to adequate sanitation and hygiene services.'** (SDG6).



**315**  
sanitation-related projects  
launched in 2021



### Examples of 2021 projects



#### Construction of the energy positive wastewater treatment plant in Cagnes-sur-Mer

The construction of the 150,000 population equivalent treatment plant, the storage/regulation structure, the transfer networks and the sea outfall are part of an advanced energy initiative: recovery of the biogas produced by the methanization of sludge, advanced energy efficiency throughout the plant, production of electricity by solar panels, etc.

Landscape integration was essential as the project site is located over a very constrained surface area in the heart of Cagnes, as well as advanced management of nuisance: completely confined structures with air treatment.

IRH Ingénieur Conseil handled the studies, the definition of energy objectives, support with the certification process, the works assignment method, the contract awarding and the monitoring of works.



#### Rehabilitation and extension of the drinking water treatment plant in Kinshasa

Antea Group carried out studies to renovate three water production modules in the N'Djili treatment plant (330,000 m<sup>3</sup>/day), the construction of drinking water storage reservoirs to the east of Kinshasa and the rehabilitation of existing structures (reservoirs, networks and access roads). These studies were carried out as part of the Urban Drinking Water Supply Project in the Democratic Republic of the Congo, the main objectives of which are to sustainably increase the production of drinking water and reduce losses in the distribution network of the public company REGIDESO. Supported by the World Bank, this national program aims to eventually improve the drinking water coverage rate in the Kinshasa conurbation of more than 15 million inhabitants.



# Hydraulic infrastructure and aquatic environments

## Control of flood risks

With climate change, regions are subject to increasingly extreme and frequent meteorological hazards which require adaptation of risk management policies, in particular during episodes of flooding (floods, coastal flooding). Our expertise is based on our knowledge and mastery of hydraulic operation (hydrology, hydromorphology, etc.) and digital tools (hydraulic modeling, data management, mapping). The means developed by Antea Group to manage this risk include the design and construction of resilient infrastructure, such as dikes and dams, the securing of existing hydraulic structures both at the level of the catchment area or the project site, with the help of our teams specialized in civil and geotechnical engineering. Rainwater management also contributes to sustainable regional development and to the safety of people and property. Antea Group offers innovative solutions through hydraulic studies and design of lasting facilities.



**107**  
hydraulic infrastructure and aquatic environment projects initiated in 2021



# Industrial water treatment and management

The challenges and needs associated with industrial water vary greatly from one site to the next, depending on the location, the industrial process, the possibility of using groundwater or surface water, the discharge of effluents into the network or into the natural environment after treatment, etc. Industries are continuously looking for specific skills to set up their water supply, industrial water production, optimize their consumption, treat their wastewater depending on pollutants and the applicable regulations, and study the possibilities of water reuse.

Antea Group provides resource management services to help companies reduce their ecological footprint. The means developed by Antea Group in industrial setting address the environmental, technical, regulatory and financial challenges of water resources management, and contribute to more virtuous modes of consumption, treatment and reuse of industrial water.



**105**  
industrial water treatment projects launched in 2021



## Examples of 2021 projects



**Restoration of the La Turdine River in the Rhône department**

IRH Ingénieur Conseil carried out an assignment to restore the ecological continuity of the La Turdine River at the Poste des Arnas weir for the Rhône and Lyon Metropolis Federation for Fishing and the Protection of the Aquatic Environment. The study focused on the removal of this obstacle located immediately upstream from a departmental structure, taking into account the potential impact on the banks, on the foundations of the bridge of the road RD67 and the floodability of the departmental road. The discharge from a nearby wastewater treatment plant was also secured. The works carried out thus made it possible to regain an obstacle-free stretch over approximately 11 km and to diversify the flows upstream from the weir.



**Hydraulic and landscaping development of the Sausset Valley**

Grand Paris Aménagement selected a project management consortium, of which Antea Group is the representative, to carry out this project which pursues a dual objective of managing rainwater from the ZAC Aérolians (mixed development zone) and controlling the risk of flooding in the Sausset Valley, while restoring one of the only open-air waterways in Seine-Saint-Denis. Part of the work is currently in progress and will make it possible to store approximately 60,000 m<sup>3</sup> of rainwater with the return to the natural environment of a flow rate limited to 39 liters/second. Eventually, approximately 150,000 m<sup>3</sup> of storage, through a dam and two basins, will help control flood risk downstream.



## Examples of 2021 projects



**Strasbourg University Hospitals (HUS) Hautepierre Hospital**

After designing and monitoring the construction of new wells (2 pumping wells and 2 reinjection wells), Antea Group set up a manganese treatment pilot on well water intended for human consumption. The rates vary from 600 to 1000 µg/liter, considering the 50 µg/liter standard. In addition to the feasibility of the treatment, the objective was to find the most suitable treatment method with regard to contact time and the small floor space available. Two treatment pilots were tested over 6 months, one catalytic and the other biological, with 4 treatment speeds for each method. A total flow of 10 m<sup>3</sup>/hour was treated continuously over 6 months. Both methods work exceptionally well with very fast treatment speeds.



**Révillon Chocolatier Industrial effluent pre-treatment plant**

Révillon Chocolatier makes confectionery products at its production site near Roanne in the Loire department. The site's activity generates between 20 and 180 m<sup>3</sup> of effluents per day. To limit the impact of its discharges, Révillon Chocolatier selected Antea Group to set up a unit to neutralize the pH of its effluents.



# 4.2

## Environment sector

- > Environmental permitting, impact assessment, control of industrial risks
- > Environmental and social impact assessment of projects to improve access to essential services
- > Services for contaminated sites, brownfield areas: rebuilding the city in the city
- > Hygiene, health, safety and environment
- > Urban air quality
- > Air and odor management (industry and construction sites)

## Environmental permitting, impact assessment, control of industrial risks

Antea Group supports project developers throughout the regulatory process until they obtain the required environmental authorizations. We work on the creation of new sites or the maintenance or the development of existing activities to ensure that the project is ecologically sustainable. Our technical and regulatory expertise enables our clients to have economically and ecologically sustainable projects. We provide our expertise for the establishment of new facilities in areas with the least environmental impact (preservation of

cultural and ecological heritage sites), and with the best available techniques to reduce pressure on resources (in terms of consumption of water, energy, construction materials, etc.) and environmental impacts. Our hazard studies highlight the risks inherent in industrial activities and the measures to be taken by project developers to ensure sufficient risk control. The entire analysis process undertaken also contributes to raising staff awareness and fostering a risk culture within the company.



**335**  
projects in 2021



**83 %** Share of our expertise on industrial permitting projects in 2021

of which **53 %** Manufacturing sector

**11 %** Green Energies/Waste



## Examples of 2021 projects

### Regulatory assistance to adapt papermaking sites to the changing market, in a decarbonization and circular economy approach

Antea Group supported four manufacturers in the paper-cardboard sector at the environmental permit application stage, in four different regions, to strengthen or adapt their production capacities. Since the paper industry is a major consumer of energy for drying paper and cardboard, these manufacturers have signed up their project to a decarbonization\* plan, i.e., reducing CO<sub>2</sub> emissions, and seeking greater energy efficiency. This course of action is becoming a real asset for the performance of their company while giving them the possibility of addressing the challenges of Sustainable Development: eventually replacing fossil fuels with renewable energies, strengthening the circular economy by recycling paper, recovering waste in manufacturing processes, preserving water resources, protecting biodiversity in forests, etc. Antea Group experts drafted regulatory dossiers (including impact and hazard assessments) while providing manufacturers with their insights and advice on how to



optimize the design of their project: reduction of environmental impacts and pressure on resources, control of technological risks, etc.

\* The 2020 National Low-Carbon Strategy set the target of reducing GHG emissions by 35% by 2030 compared to 2015 for French industry. This target has been raised to 39% by the paper industry.



## Environmental and social impact assessment of projects to improve access to essential services



For more than 30 years, Antea France has supported international development projects funded by international financial institutions such as the World Bank or Agence Française de Développement for better access to essential services: energy, transport, water, sanitation. For such large-scale projects - construction of a power line, a road, etc. - it is imperative to identify, avoid, minimize, and as a last resort compensate for the damage caused to populations and to the environment. For this, Antea Group carries out environmental and social impact

studies as well as associated studies with local partners and multidisciplinary experts. They consist, from the start of the project design phase, in assessing the risks to the environment or to local populations, defining measures to reduce these impacts, and developing an action plan promoting sustainable development. We provide our services in compliance with the latest international environmental and social standards in force, in particular the IFC (International Finance Cooperation) standards of the World Bank.



### Examples of 2021 projects



#### Environmental and social assistance to the MCC in Morocco

The Millennium Challenge Corporation (MCC) signed an agreement for \$450 M USD over 5 years with the Moroccan government on the "Compact II" cooperation program consisting of two projects: "Education and training for employability" and "Land productivity". Antea Group is assisting the MCC in particular in the HSE monitoring of renovation sites (schools, two industrial zones) and construction sites (training centers, nine sustainable industrial zones), as well as in the privatization of public agricultural land to increase agricultural productivity. Antea Group reviews all deliverables which have an environmental and social component, and technically supports the management of contaminated sites, industrial risks and industrial water.



#### Study on the socio-economic impacts of the closure of the COMINAK mine (Niger) and on economic repurposing

Antea Group was entrusted by the Ministry of Planning-PRACC (project in support of competitiveness and growth) of the Republic of Niger to carry out the assessment of the socio-economic and environmental impacts of the closure of one of the largest underground uranium mines in the world, whose activity since the 1970s has been one of the country's main economic assets. The studies focused on the review of the environmental impact assessment studies related to the closure of the mine as planned and carried out by the Akouta Mining Company (COMINAK) for the redevelopment of the site, as well as on the economic repurposing projects proposed, in particular linked to gold panning and agriculture.

## Services for contaminated sites, brownfield areas: rebuilding the city in the city



Our projects related to decontamination or reconversion of former brownfield sites for future urban developments, most often located in the heart of cities and urban conurbations, fall within the government's objective of "zero net artificialization" by 2050 of agricultural land or natural spaces, in particular by favoring the renewal of areas already built up to fight against urban sprawl. Whether we act as an engineering company, as assistant to the contractor or as project manager of rehabilitation works

on site, we are one of the first stakeholders to participate in the reduction of the negative environmental impact of urbanization, including by paying particular attention to the environment around construction sites. We are implementing innovative techniques (decontamination tents) that significantly reduce unpleasant smells and contribute to the preservation of air quality for the populations near rehabilitation sites.



More than **2000** environmental surveys on potentially polluted sites in 2021



More than **270** projects in which we acted as assistant to the contractor or as project manager for site remediation in 2021



### Examples of 2021 projects



#### Repurposing of a brownfield site in the La Cartoucherie eco-district in the heart of Toulouse

Antea Group has been carrying out a contractor assistance assignment since 2015 for the repurposing of a 33-hectare urban brownfield site for the SEM (mixed economy development company) OPPIDEA Toulouse Métropole. Its redevelopment required the implementation of virtuous practices in the management and monitoring of the site. To promote the circular economy while enabling the development of green spaces, the sorting of excavated soil has been optimized for reuse on site. Soil decontamination tests using phytoremediation techniques are being considered. The environmental engineering developed by Antea Group thus makes it possible to optimally reconcile the large-scale organization of the various project spaces with the constraints linked to the environmental liabilities of the site.



#### Redevelopment of a brownfield site in the Aix-Marseille-Provence Metropolis

Located in the municipality of Ensues-la-Redonne, *Parc des Aiguilles* had quarrying and waste incineration activities in the 1960s. Abandoned, it then became an open dump. Today, the Barjane group is developing a new metropolitan logistics site over 62 hectares with the support of the Metropolis. Antea Group has assessed the impact of anticipated pollution and provided solutions for managing surface waste and concentrated pollution. A solution for reusing materials after sorting and checking has been implemented, including checking for the possible presence of asbestos. This project is exemplary in terms of sustainable development, and will create more than 1,000 jobs.





## Focus : identification of emerging pollution - example of PFAS compounds

PFAS, or per- and polyfluoroalkyl compounds, form a family of approximately 9,200 substances. Their common feature: a carbon structure with Carbon-Fluorine chemical bonds, which are among the strongest that exist. These give them unique characteristics: high stability, resistance to heat, oils, stains, grease and water.

PFAS compounds are found in the composition of thousands of products – certain firefighting foams, food packaging, non-stick cooking utensils, clothing and textiles, sun creams, etc. – and certain manufacturing processes such as the manufacturing of semiconductors, plastics, etc.

In the context of waste management, PFAS compounds can be transferred into the air, water, soil, and enter the food chain.

The health and environmental risks they represent come from the various modes of transfer, their extreme

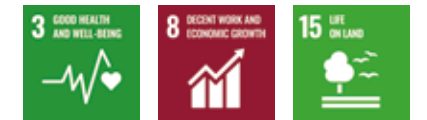
persistence in the environment and their accumulation in our body. PFASs are endocrine disruptors and can have many adverse effects on ecosystems and human health.

In 2020, the EFSA (European Food Safety Authority) drastically reduced the safety threshold for the main PFAS compounds, from an acceptable daily intake of 270 ng/kg of body weight (sum of PFOS and PFOA) in 2009, to 0.63 ng/kg (sum of PFOS, PFOA, PFNA, PFHxS).

Since 2021, Antea Group has been supporting manufacturers, local authorities and water resource managers to establish a pollution diagnosis for a given site or region. If pollution is observed, Antea Group offers a risk assessment, advice for the redevelopment or repurposing of the site, a feasibility study, the design of innovative resorption techniques, or project management services for decontamination works.

## Hygiene, health, safety and environment

The management of companies in the fields of hygiene, health/safety and the environment aims to anticipate and reduce risks (particularly in terms of work accidents and environmental issues) but also to promote wellbeing at work. In this strategic area, Antea Group creates and implements effective HSE programs in France and internationally, and ensures their application in particular with regard to compliance with current and future regulations. We identify the applicable requirements in the areas of the Environment and Working Conditions, and assess the compliance of our clients' sites and activities with these requirements. We offer at least to bring their sites to compliance and assist them in the deployment of continuous improvement measures.



## Examples of 2021 projects



### Assistance to the Autonomous Port of Pointe-Noire (PAPN project) in terms of Health Safety Quality Environment

The PAPN project obtained co-financing from Agence française de Développement and the EU for a technical assistance assignment aimed at strengthening its HSQE Department and guaranteeing environmental management of the port in accordance with international standards and conventions ratified by the Republic of the Congo. Antea Group supports the HSQE Department by strengthening its organization as well as its areas of intervention. The missions also relate to assistance with ensuring regulatory compliance concerning the management of waste, hazardous materials, industrial risks, antipollution combat and urgency, as well as the installation of an ISO 14001-type environmental management system.



### Improving air quality by treating emissions

Normandy Coating is a polyester film coating manufacturer for printed electronics, textile transfer, adhesives, etc.

Keen to improve the air quality in its workshops, reduce the exposure of employees and its environmental footprint by the treatment of atmospheric emissions, the client selected us to set up a purification system. Our turnkey services range from the initial diagnosis of emissions to the work required for its implementation. With this ambitious goal of 98% reduction, we are carrying out design studies for the capture, ventilation and treatment of emissions by regenerative thermal oxidation.



## Quality of urban air



At the end of 2021, the WHO recalled the importance of air/climate/health interactions. It has lowered its guideline values, exceeding which is associated with significant health risks. These new recommendations will ultimately lead to a reduction in the French threshold values in the French Environmental Code.

To help local authorities meet the challenges of air quality in their area, Antea Group and IRH Ingénieur Conseil offer their expertise in diagnoses: in situ measurement campaigns and data analysis, modeling studies of pollution sources in urban areas, assessment of health risks related to particulate emissions. Targeted actions are then defined in order to avoid, reduce or offset the impacts of pollution sources (road traffic, urban heating, industrial activities).



## Air and odor management (industry and construction sites)



Industrial and eco-industrial processes can also have an impact on air quality and create issues for local residents. To deal with these issues, national regulations are increasingly strict, like the new Odor obligations stemming from the ministerial decree on methanization activity in 2021. The solutions involve diagnostic missions (sampling, analysis, modeling) and assistance in the commissioning of gas treatment technologies. In addition to industry, decontamination sites are increasingly subject to cutting edge monitoring of atmospheric pollutants and odors.



80

measurements - engineering projects for ambient air & odor in 2021



### Examples of 2021 projects



#### Measurement of air and soil quality as part of the creation of a new tram line in Brest

The management of this project, which is part of the 2019-2025 Climate Plan for Brest metropolis, required an air and health study. IRH Ingénieur Conseil collected data in the study area. Measurement points (38 in total for air quality, and 5 for soil quality) were distributed along the line route, in particular at the most sensitive places such as nurseries, schools and hospitals, with view of characterizing the baseline conditions. These data were used by the company Numtech, which specializes in atmospheric modeling, in order to project these baseline conditions through to the end of the project.



#### Innovations tested on the athletes' village against outdoor air pollution

Among the outdoor air treatment solutions adopted by SOLIDEO, the Olympic facilities delivery company, is Terrao-RA, which brings together 3 entities: the decontamination solution provider Starklab supported by 2 engineering companies specialized in air quality, Rincent Air and Antea Group. Our air engineering teams are contributing to reducing the presence of fine particles and nitrogen dioxide, pollutants from road traffic, in the area of the future Quinconces terrace in Saint-Ouen. Antea Group is thus involved in demonstrating innovative urban development solutions, dedicated to the sport events in Paris in 2024.



### Example of 2021 projects

#### Monitoring of polluted lagoon remediation works

As part of sensitive works to remediate an industrial effluent storage lagoon on the site of an SNPE (National Powders and Explosives Company), Antea Group deployed a continuous air-odor monitoring protocol over and around the site. Based on data from the soil contamination report, our teams developed specific monitoring: choice of equipment for continuous monitoring of the presence of dust and VOCs in 6 areas, continuous measurements by field mass spectrometry, study of 13 workstations of site operators, more than 200 olfactory readings, alert and action procedure. This system was then deployed during the 3 weeks when works were carried out with the permanent presence of 2 technicians/engineers from Antea Group. Thanks to this continuous and concerted monitoring during the works site phase, the intervention conditions were optimized to ensure the safety of operators and prevent any impact on the surrounding area. Our monitoring will continue each summer until 2025.





# 4.3

## Infrastructure sector

- > Decommissioning and circular economy
- > Risk management (asbestos, lead)
- > Geotechnical engineering for renewable energies
- > Civil engineering and structures for sustainable infrastructure
- > River, maritime, and natural hazard works
- > Management and recovery of waste (materials, energy)

## Decommissioning and circular economy

The many decommissioning projects carried out each year by Antea Group in dense urban areas, industrial or tertiary sites include the recovery of decommissioned components. Their reuse presents twofold environmental added value: the preservation of natural resources and

reduction in the volume of waste. Antea Group thus participates in the development of the circular economy by seeking the best re-use and recycling solutions adapted to each item.



### Example of a 2021 project



#### Coordination of an innovative circular economy project

The Pau Pyrénées Conurbation Authority wished to redevelop the Saragosse neighborhood in Pau and give it a new residential appeal. Pau Béarn Habitat planned the demolition of an apartment building to build a park. Antea Group coordinated the studies and monitored the reuse process led by a partner. The reuse actions focused on the recovery of equipment for the neighboring towers and the Saragosse park, the establishment of a pop-up recycling project for the sale of materials and equipment in good condition, and on-site backfill for the new park. In total, the initiative saved 26 tons of CO<sub>2</sub>.



**435 000**

tons (40 times the Eiffel Tower) of materials recycled throughout our projects in 2021

\* mainly recycled crushed concrete

## Risk management (asbestos, lead)

Another part of the decommissioning activity concerns asbestos removal and lead risk management, in particular on renovation works sites of listed monuments. Our know-how in this area addresses a

major public health issue, and by removing asbestos from the environment we improve the living environment.



### Examples of assignments



#### Lead management in heritage restoration

Lead has been used for millennia in our historic monuments. The issue is how to manage it on restoration sites. Our experts are involved in the organization, management and control of compliance of multiple stakeholders' activities. They implement safe intervention protocols on site. They train specialized professionals to take into account the risk of exposure to this "heritage lead": compliance with health and safety instructions, use of appropriate equipment. The assignments are carried out in consultation with the Health and Culture bodies specializing in prevention and control.



## Geotechnical engineering for renewable energies



Antea Group mobilizes its know-how, particularly in geotechnical engineering, for the development in France of wind farms and photovoltaic farms that supply energy to a large number of inhabitants and businesses while making it possible to reduce CO<sub>2</sub> emissions in the atmosphere. Antea Group seeks innovative solutions in the design of sustainable infrastructure.

In the wind energy sector, the current fleet requires extensive renewal by 2030. Antea Group is engaged in the FEDRE (Sustainable Wind Farm Foundations with REpowering) research program with the aim of designing foundations that will enable existing concrete footings to be adapted to more powerful wind turbines.

This is also the case in photovoltaic farm projects whose ground installation is scheduled on former household and inert waste storage sites for which a new use is strongly



constrained. Antea Group applies appropriate techniques to stabilize the peripheral slopes of the waste pile, assess the risk of piling up the waste mass, and assess the risk of fire linked to the presence of biogas. Specific construction recommendations allow a new use of these abandoned spaces for the development of renewable energy that does not 'consume' new agricultural and natural spaces.



# 1 200 MW

cumulative power of wind and photovoltaic projects studied by Antea Group in 2021



### Example of a 2021 project



#### Securing the installation of a wind farm on a steep site in Aveyron

Wind power is an important focus of the National Low-Carbon Strategy. As the second source of renewable electricity production after hydropower, it is experiencing significant growth, particularly in the Occitanie region. The Municipality of Melagues wanted to build a wind farm with 14 machines, on land whose slopes reach 40% gradient in places. This situation is exceptional, as wind turbines are usually installed on relatively flat and easily accessible terrain. Antea Group's geotechnical experts assisted the project manager to eliminate the risk of instability and sliding of structures. They prepared the access for the drilling machines in areas which were difficult to access. The location of 3 wind turbines on the steepest slopes required TALREN modeling to be carried out. The altimeter setting of the foundations and crane platforms secured the installation and the future operation of these wind turbines.

## Civil engineering and structures for sustainable infrastructure



The maintenance of significant heritage facilities in our territories is now a major challenge for sustainable development. Engineering on existing structures has become a real expertise provided by Antea Group. Daily services are very varied: degraded masonry bridges to be consolidated, metal structures to repair or repaint, existing bridges to be adapted to new uses (walking, cycling), cracked retaining walls, etc.

In the management of our projects, functionalities, budgetary constraints, user safety and environmental protection are at the heart of our concerns. And the digital transformation led by our Data Department makes data management more efficient to extend the operating life of structures.



# 4 000

tons of CO<sub>2</sub> not released in 2021 \*  
\* by renovating rather than building new structures, i.e. a 50% reduction in emissions



### Examples of a 2021 projects



#### Works to reinforce emblematic maritime heritage at the Port of Bayonne

The port entrance arcatures and piers located at the mouth of the Adour are structures which were built at the end of the 19th century. The arcatures have a hydraulic function to dissipate and absorb the swells going up the channel. They also offer a remarkable setting. Significant issues were found such as tilted or collapsed columns for the arcatures, and large cavities at the piers. These findings justified the urgency of scheduling safeguard interventions. Antea Group carried out a complete diagnosis for the Nouvelle-Aquitaine Region and defined a works and monitoring program to ensure the sustainability of these maritime structures.



#### Securing the Pont d'Enfer in the Pyrénées-Atlantiques

This structure, classified as an Historic Monument, leads to the Fort du Portalet. A crack on one of its pillars threatened it as well as the RN 134 road in the event of collapse. Antea Group provided project management services for the emergency works. In the preparatory phase, they consisted of setting up scaffolding, carrying out temporary slinging of the abutment using a helicopter-borne pumping device and draining the Gave d'Aspe located 25 meters below the bridge. The consolidation works focused on filling the cavities with shotcrete, making 20 ml anchors by core drilling and injecting the masonry of the abutment. The fragmentation of a rocky mass also required a helicopter to move the boulders.



# River, maritime and natural hazard works



Reducing natural risks is a major issue for the safety of people, sites, and infrastructure. These risks involve floods and coastal flooding, erosion of cliffs and banks, falling boulders, landslides, soil collapse, etc. Climate change increases their frequency and intensity (storms, heat waves, etc.). The proper management of these hazards is based on expert approaches (geotechnical, civil engineering and structures), adapted to the contexts and their vulnerability. Antea Group uses its know-how on many exposed and



weakened sites and infrastructure such as coastline, cliffs, buildings, roads, structures, maritime and river structures, etc. Some, emblematic, are classified as Historic Monuments, UNESCO sites or have a heritage character to be preserved.

**750 km**  
of coastline studied to improve its protection and that of the population

## Examples of 2021 projects



### Hazard studies on 3 classified dikes on the Alabaster Coast

The Syndicat Mixte du Littoral de la Seine-Maritime manages, under the authority of GEMAPI (management of aquatic environments and the prevention of flooding), 3 sea flood protection dikes at Veulettes-sur-Mer/Paluel, Saint-Aubin-sur-Mer and Étretat. Their classification entails the obligation to study hazards to prove their safety in all circumstances. Antea Group experts have characterized the performance of dikes faced with flooding hazards based on an in-depth diagnosis and hydraulic modeling. The studies make it possible to define the protected areas behind these structures, to improve the maintenance and monitoring of dikes, as well as crisis management by the Syndicat Mixte.



### Reinforcement works on the Côte des Basques in Biarritz

The Basque coast has never been so threatened by erosion as it is now. This phenomenon, which is both age-old and natural, is accentuated by climate change: more marked rainfall, rise in sea level, etc. In Biarritz, the strategy adopted aims to combat this natural erosion. Works phased over 5 years must consolidate the cliff over approximately 1,200 meters. Antea Group accompanied the city in the first phase of works which focused on the development of retaining and drainage structures, the elevation of the riprap bottom dike and the creation of an access ramp to the beach, in a very constrained context linked to accessibility, the summer period and the tides.

# Management and recovery of waste (materials, energy)



Historically involved in waste storage, Antea Group is now specialized in the entire cycle of waste management: from collection to recovery, in the service of the circular economy.

The search for new channels for site excavation materials is a focus of this recovery activity, integrating the requirement of waste traceability. For waste that cannot be recycled, the energy produced during its treatment by combustion or anaerobic digestion can be used as heat or electricity. Antea Group's expertise in renewable energies also involves the development of photovoltaics on post-operation storage sites.

Antea Group develops solutions for improving the environmental performance of storage sites and optimizing the operation of waste treatment facilities. Discussions also focus as regards large territories on the organization of a balanced and efficient collection and treatment offer (shared sorting centers, new generation waste reception centers, recycling centers, incinerators, etc.).

**100**  
waste facilities which Antea Group optimized for better waste management and recovery in 2021

## Examples of 2021 projects



### Construction of a new generation sorting center for West and Center Hérault

The plastic waste recycling reform extends sorting instructions in France to all packaging starting 2023. Local authorities must therefore modernize their sorting center by 2026. From 2020, 7 local authorities in the Hérault department decided to set up a new sorting center on a former quarry site in Saint-Thibéry. This facility will process the recyclable waste of more than 500,000 permanent residents and will promote the development of a circular economy. Antea Group assisted SPL OEKOMED with the preparatory studies, the regulatory and subsidy dossiers, and the awarding of a global performance and design contract.



### Knowing more about and managing plastic pollution in the Indian Ocean

Every year, millions of tons of plastic waste end up in the oceans, directly threatening marine life. Through the five-year ExPLOI project (Indian Ocean Plastic Expedition), the Indian Ocean Commission is committed to two main objectives: to change practices as regards plastic and to recycle waste. The French Global Environment Facility and the Agence française de développement support this project. Antea Group experts carried out a diagnosis of plastic waste in Madagascar, a high-stake territory for the IOC zone. The study made it possible to better understand the local management of this pollution and the potential for the development of a "plastic" circular economy.



# 4.4

## Measurement and environmental data management sectors

- > Water quality measurements
- > Measurements of atmospheric and outdoor air emissions
- > Occupational exposure and indoor air measurements
- > Data acquisition and management
- > Modeling and spatialization: data in the service of decision-making

## Water quality measurements



IRH Ingénieur Conseil teams are qualified to characterize any type of effluent, define the baseline conditions of the natural environment, and assess the functioning of existing treatment units for a variety of clients: manufacturers, local authorities, and institutions. Our expertise focuses on the quality of wastewater, groundwater, surface water and untreated water to help our clients maintain their compliance with applicable regulations, thus protecting populations while optimizing existing treatments and contributing to sustainable development.

All the data collected are used for monitoring purposes and adapting local water management policies at different levels.



**1 801**  
projects in 2021

## Measurements of atmospheric and outdoor air emissions



Air quality has become a major issue for the preservation of our environment and our living environment. As such, our teams are mobilized to carry out air emission and ambient air controls in our clients' industrial or collective facilities. They also carry out checks and validations of gas discharge self-monitoring systems.

**OUR OBJECTIVE**  
Audit and control



**221**  
projects in 2021



**10 384**  
parameters analyzed in 2021



# Occupational exposure and indoor air measurements



The good quality of the air inside buildings (industries, offices, housing, buildings open to the public) is an essential parameter for the health and comfort of their occupants. According to the French Labor Code, employers must conduct a chemical risk assessment as well as regulatory controls of occupational exposure.

To do this, IRH Ingénieur Conseil teams carry out comprehensive surveys (chemical risk assessment, sampling strategy, measurements and controls of exposure to chemical agents, etc.) and offer solutions to improve the air quality in buildings.



**398**  
projects in 2021



**10 866**  
parameters analyzed in 2021



## Examples of 2021 projects



### Assessment and monitoring of employees' exposure to pollutants within an automotive group in France

Carrying out a technical control of chemical risk is an obligation under the French Labor Code. Beyond the regulatory aspect, with 100 sites and 3,000 samples per year, to facilitate monitoring our teams have created a results visualization platform accessible with a simple Internet browser. The banking, use and securing of these data are essential technical assets for this type of service where the challenge is to monitor the exposure of operators during their professional life. These data, combined with an airflow diagnosis, makes it possible to detect anomalies and to draw up a progress plan (optimization of ventilation).



### Support with environmental monitoring for a French pharmaceutical company

Protecting health and environmental performance are major challenges for everyone. Through its HSE policy, our client is committed to implementing solutions aimed at preserving the environment by controlling its industrial facilities and by implementing actions to reduce environmental impacts. We assist our client by conducting annual regulatory monitoring and verification of its compliance with the air and water regulations: atmospheric emissions, dust fallout, occupational exposure and aqueous discharges, but also on a more ad hoc basis by performing characterization or diagnoses of a given environment or installation.

# Data acquisition and management



Improving information systems on water, aquatic environments and their uses is one of the essential cornerstones of better governance and integrated water resource management. The authorities and bodies responsible for water management are required to create or develop such systems at national or regional level, to cope with the explosion of digital data and benefit from more efficient decision-making tools. Antea Group plays a major role in environmental data

engineering and deploys data management solutions and environmental information systems, and carries out audits, support and technical expertise assignments to meet these challenges.

Antea Group also supports industrial operators in the context of climate change, securing the resources with data management solutions, and monitoring for continuous environmental supervision and environmental prediction tools.



**11.5 million**  
volume of data we managed in 2021



**56 %**  
of the national territory covered by our solutions in 2021



## Examples of 2021 projects



### Monitoring the quality of inland waters in the Loire-Brittany basin

Since 2001, Antea Group has managed the data bank on the quality of surface water of the Loire-Brittany Basin. This tool gives citizens, via a collaborative internet platform, information on the quality of waterways and water bodies. In 2021, the Water Agency once again put its trust in Antea Group, renewed this contract, and extended it to the management of groundwater quality data. To date, all measurement campaigns on inland waters are scheduled. The results are centralized, checked, formatted and integrated into a data bank developed by our data management experts. The data bank now includes more than 50 million data items on the quality of the natural environment of the Loire-Brittany basin.



### Digitization of an industrial group's environmental data management

We deployed the Lyxea Industrie solution, a software solution that makes it possible to consolidate, process and report all of the Group's environmental data for all of its French production sites as well as its plants around the world. The tool meets one of the Group's main objectives: to secure all environmental data in a single tool. The use of our Lyxea solution also makes it possible to correlate environmental data with operation data (production, energy, etc.), to reallocate the time dedicated to data management to other analysis and management tasks, and to have better visualization of defaults and non-conformities. It thus gives the Group better control of its environmental impact.



## Modeling and spatialization: data in the service of decision-making



Decision-making in the field of environmental engineering first requires expert-level processing of increasingly numerous data. Knowledge and value do not come directly from the accumulation of this data, but from the associated valorization and modeling processes.

Thus, Antea Group implements a modeling and prospective simulation approach to understand complex environmental processes. The methods and techniques for acquiring, processing, and reporting georeferenced

data have indeed become essential for preventing and combating natural risks, studying impacts, or managing land use.

The combination of our technical expertise and our digital tools is key to support our clients and partners in their environmental approaches through the many services we offer: statistical data analyses, cartographic and spatial analyses, modeling and characterization of phenomena.



### Examples of 2021 projects



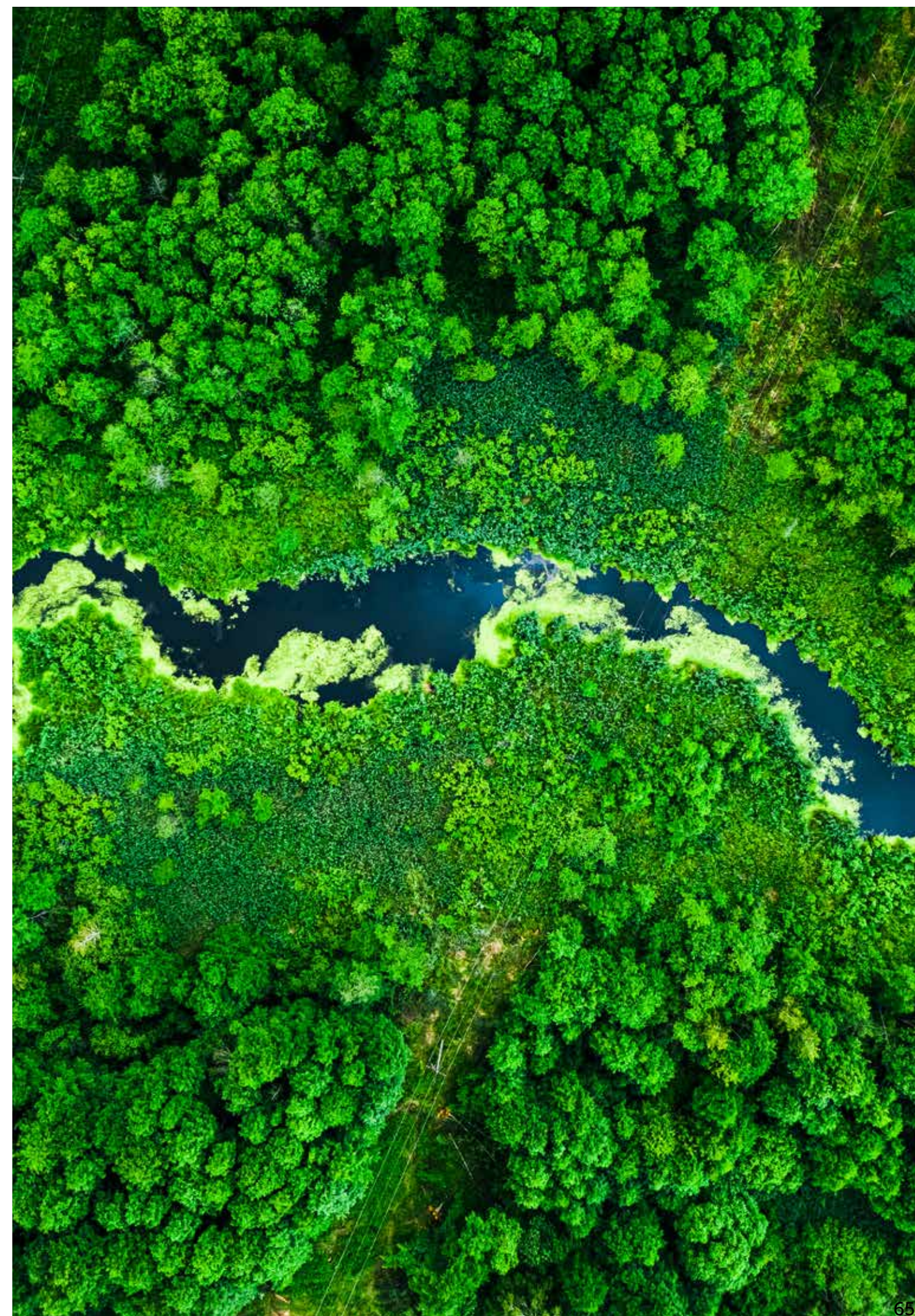
#### Analyzing the monitoring network for an Inter-Water Agency

Monitoring the quality of French waterways is used to report indicators of their ecological and chemical state at national and European level as part of the implementation of the Water Framework Directive. Such monitoring is carried out in particular by Water Agencies and involves approximately 4,500 regulatory monitoring stations. It makes it possible to report on 9,750 bodies of water, and to plan over 6-year cycles (SDAGE cycle) the management of all French waterways. Antea Group studies the monitoring strategies deployed within each Water Agency in order to determine areas for improvement, to offer more effective national monitoring, and to guarantee the reliability of the results produced. This assignment is led by the Rhône-Mediterranean-Corsica Water Agency with the participation of the French Office for Biodiversity.



#### Assistance to the Data and Statistical Studies Department (SDES) with geomatics

The SDES organizes the observation and statistical system related to accommodation, construction, transportation, energy, the environment, and sustainable development. Antea Group provides its expertise in geomatics and assists the client in completing mapping and geographic work which then feeds into publications, tools, as well as the SDES website.







4.5

Research & Development  
Innovation  
Scientific and teaching  
activities

## Scientific and teaching activities

Our Research & Development - Innovation activities are part of an open and collaborative approach. We are strongly involved in associations, scientific and technical institutions, and competitiveness clusters that contribute to innovation and sustainable development.

Many Antea Group engineers and experts devote part of their time to teaching. They teach under water, environment and infrastructure academic programs in various universities and specialized graduate schools in France. They also help students with the drafting and defense of their thesis.



163 days

our investment in 2021 in the  
associations and competitiveness  
clusters indicated below



&gt; 50 days

our investment  
in teaching in 2021

## Main technical associations and competitiveness clusters in which employees of Antea Group are active

### Technical or scientific associations

**AFNOR:** French Association for Standardization

**UPDS:** Union of Site Decontamination Professionals

**ASTEE:** Scientific and Technical Association for Water and the Environment

**FIMEA:** Interprofessional Federation of Atmospheric Environment Professions

**B2E-Bretagne Eco-Entreprises:** regional cluster for the ecological and energy transition in Brittany

**AFTES:** French Association of Tunnels and Underground Space

**CFMS:** French Committee for Soil Mechanics and Geotechnics

### Competitiveness clusters

**DREAM Eaux et Milieux:** Competitive cluster for the water and its environments sector in Centre-Val de Loire

**HYDREOS:** Competitive cluster for the water sector in the Grand Est

**France Water Team:** National Federation of Water clusters

**TENERRDIS:** Competitiveness cluster for energy transition

**INDURA Auvergne-Rhône-Alpes:** Innovation in infrastructure and civil engineering



# Research & Development - Innovation

Technical excellence and innovation are deeply embedded in Antea Group's development strategy. The Research & Development - Innovation Department focuses its activities on complex environmental issues, and offers ever more sustainable, optimized, and secure solutions. Particular attention is paid to projects that affect

the entire environmental data value chain, including data acquisition and management, the creation of dedicated information systems, the valorization of data, namely by using innovative predictive models.

## Identification of emerging pollutants

**PFAS compounds**  
PerFluoroAlkylSubstances are a growing health issue in France because of their toxicity and their persistence in the environment (see page 50). Based on a matrix indicating the use of PFAS compounds in various industrial sectors, Antea Group has developed a tool to quickly pre-identify the potential

for PFAS pollution, such tool is intended for local authorities and manufacturers. Special attention has been paid to the mapping of high-risk sites in particular because of the use of class B anti-fire foams which contain PFAS compounds.



## Strengthening the circular economy

Through its research programs, Antea Group contributes to the development of the circular economy. The following 3 projects illustrate the diversity of the fields of application: construction materials, civil engineering structures, sanitation process, water cycle.

**The Cycle Terre project** focuses on the recovery of unpolluted soil excavated during the construction of future train stations in Grand Paris to produce, on site, natural

construction materials. Led by the city of Sevran, Cycle Terre is funded by the European FEDER fund and is winner of the 2017 UIA edition (UIA: Urban Innovative Actions, an initiative of the European Union with the objective of testing innovative ideas and supporting urban authorities towards sustainable urban development).



Antea Group has been studying the application of **Life Cycle Analysis (LCA)** within the framework of its projects. This method makes it possible to assess the overall environmental impact of a product or a process throughout its life cycle, based on several criteria such as GHG emissions, consumption of natural spaces, the scarcity of mineral resources, the eutrophication of wetlands, as well as their potential Life Cycle Analysis of different processes of recovering sewage

sludge as well as a LCA relating to the design of reinforced concrete retaining structures or ripraps have been carried out using the specialized software UMBERTO.

**The AQUANES project** aims to reuse water by developing innovative treatment techniques. Antea Group has developed an IT tool to control the refining of natural decontamination of wastewater leaving wastewater treatment plants through the ground. It allows for optimized operation with controlled aquifer recharge. The EviBAN project also seeks to broaden the scope of the reuse of waters. The results will be integrated into an IT toolbox which makes it possible to effectively investigate and manage the treatment of water using different soil types.



## Resilience of infrastructure

Several Antea Group R&D topics aim to ensure the sustainability of infrastructure. Our teams of geotechnical experts work, for example, on modeling the resistance of structures to earthquakes, with practical applications for hydraulic embankment dams in the West Indies.



They are also involved in the **FEDRE research project (Sustainable Wind Farm Foundations with Repowering)** which aims to extend the life of wind turbines by designing adaptive foundations. To improve the performance of drinking water supply networks of small and medium-sized local authorities, the **SPHEREAU project** relies on Artificial Intelligence (AI) models to valorize self-monitoring data. It thus helps plan interventions, the renewal of pipelines, etc.



Antea Group is taking part in the **Dolmen project**, which aims to make progress in understanding the behavior of masonry structures made of stone or brick, and civil engineering works (bridges, tunnels, dikes, dams, etc.). These structures generally require materials with a lower carbon footprint than reinforced concrete structures. This project focuses on specific economic, sustainability and safety issues for project owners.



## Development of renewable energies

**The Vélégéo project**, led by ENGIE Solutions France and the Town of Vélizy-Villacoublay, resulted in an innovation conceived with Antea Group: the geothermal doublet of the Dogger aquifer, with a vertical depth of 1,600 m with multi-drain drilling architecture, increases the energy efficiency of the facility.



Antea Group has developed a methodology promoting the emergence of projects **for the energy recovery of water** in a given region. Groundwater, drinking water, wastewater and their sanitation processes, waterways and the sea are all potential sources of renewable energy.



## Environmental predictive modeling

Antea Group continues to develop environmental predictive tools based on the combination of proven classic models and Artificial Intelligence (AI) algorithms. These "real-time" operational tools are used to forecast various natural phenomena such as flooding of coastal urban basins (RISCOPE project). Eventually, decision makers who are not specialists in modeling, will be able to carry out predictive simulations for their region using these tools in order to:

- > check the matchup between water resources and socio-demographic trend and climate change;
- > anticipate the impact of extreme weather events on flooding and droughts;
- > objectify the investments to be made in their water management infrastructure.







# Correspondence table SDGs and Antea Group activities



Enable everyone to live healthily and promote the well-being of everyone at all ages. Promote mental health and wellbeing. Reduce accidents on the road. Reduce deaths and illnesses due to dangerous chemical substances and pollution in the air, water, and soil.

**P19/22 - Cohesion, health and well-being at work- Safety**  
**P51/53 - Hygiene, health, safety, environment - Urban air quality - Air and odor management**  
**P55 - Risk management (asbestos, lead)**  
**P61/62 - Water and air quality measurements**  
**P68 - R&D-I Identification of emerging pollutants**



Achieve gender equality and empower all women and girls. Adopt policies for the promotion of gender equality.

**P16 - Diversity and non-discrimination**



Ensure access for all to sustainably managed water supply and sanitation services. Ensure that water resources are used much more efficiently in all sectors. Ensure the integrated management of water resources. Ensure access to drinking water at an affordable cost, and access for all to sanitation services. Improve water quality by reducing pollution, by halving the proportion of untreated wastewater.

**P41 - Sustainable management of water resources**  
**P43 - Drinking water and sanitation infrastructure**  
**P45 - Industrial water treatment**  
**P63 - Data acquisition and management**  
**P68 - R&D-I Circular economy, resilience of infrastructure, predictive modeling**



Guarantee access for all to reliable, sustainable and modern energy services at an affordable cost. Significantly increase the share of renewable energy in the global energy mix. Provide modern and sustainable energy services to all inhabitants of developing countries.

**P42 - Energy recovery linked to water**  
**P48 - Environmental and social impact assessment of projects to improve access to essential services**  
**P56 - Geotechnical engineering for renewable energies**  
**P59 - Waste management and recovery**  
**P69 - R&D-I Development of renewable energies**



Promote sustained, inclusive, and sustainable economic growth, productive full employment, and decent work for all. Promote safety in the workplace.

**P22 - Safety**  
**P51 - Hygiene, health, safety and the environment.**



Build resilient infrastructure, promote sustainable industrialization that benefits everyone and encourage innovation. Adapt industries to make them sustainable, through a more streamlined use of resources and increased use of clean and environmentally friendly industrial technologies and processes. Boost scientific research, encourage innovation, increase public and private spending devoted to research and development.

**P47 - Environmental permitting - Impact assessment - Control of industrial risks**  
**P64 - Modeling and spatialization: data in the service of decision-making**  
**P68 - R&D-I Identification of emerging pollutants**



Make cities and human establishments inclusive, safe, resilient, and sustainable. Significantly reduce the number of people affected by disasters, including those related to water. Reduce the negative environmental impact of cities per capita, paying particular attention to the quality of air and waste management. Protect and preserve the world's cultural and natural heritage.

**P44 - Hydraulic infrastructure and aquatic environments - Control of flood risks**  
**P47 - Environmental permitting, impact assessment**  
**P49 - Services for contaminated sites, brownfield areas: rebuilding the city in the city**  
**P55 - Decommissioning and the circular economy**  
**P57 - Civil engineering and structures for sustainable infrastructure**  
**P58 - River, maritime and natural hazard works**  
**P59 - Waste management and recovery**  
**P68 - R&D-I Reinforcement of the circular economy**



Establish sustainable consumption and production patterns. Achieve sustainable management and rational use of natural resources. Achieve environmentally sound management of chemical products and all waste, and significantly reduce their release into the air, water and soil. Significantly reduce waste production through prevention, reduction, recycling and reuse. Promote sustainable practices in the context of public procurement. Make sure that all people, everywhere in the world, have the information necessary for sustainable development. Help developing countries move towards more sustainable consumption and production modes.

**P26 - Our environmental commitments in the operation of the company**  
**P48 - Environmental and social impact assessment of projects to improve access to essential services**  
**P55 - Decommissioning and the circular economy - Risk management (asbestos, lead)**  
**P59 - Waste management and recovery**  
**P68 - R&D-I Reinforcement of the circular economy**



Take urgent action to combat climate change and its repercussions. Improve education, awareness regarding adaptation to climate change. Reinforce resilience and capacities for adapting to climate hazards and climate-related natural disasters.

**P26 - Our environmental commitments in the operation of the company**  
**P41 - Sustainable management of water resources**  
**P44 - Hydraulic infrastructure and aquatic environments - Control of flood risks**  
**P58 - River, maritime and natural hazard works**  
**P69 - R&D-I Environmental predictive modeling**



Preserve and restore terrestrial ecosystems, ensuring that they are exploited in a sustainable way, manage forests in a sustainable way, fight against desertification, halt and reverse the process of land degradation and end biodiversity loss. Guarantee the preservation, restoration and sustainable exploitation of terrestrial and freshwater ecosystems and related services. Integrate the protection of ecosystems and biodiversity in national planning, and in development mechanisms.

**P41 - Sustainable management of water resources**  
**P44 - Hydraulic infrastructure and aquatic environments - Control of flood risks**  
**P47 - Environmental permitting - Impact studies - Control of industrial risks**  
**P51 - Hygiene, health, safety and the environment**  
**P63 - Acquisition and management of environmental data**



Significantly reduce corruption and the practice of bribes in all their forms.

**P8 - Human rights and ethics.**





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