

**CLIMATE RISKS  
HOW EDF  
IS ADAPTING  
TO CLIMATE  
CHANGE**



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# EDITORIAL

**Carine de Boissezon,**  
Chief Impact Officer

For too long, addressing the topic of adaptation has been seen as giving up on fighting climate change, or at least as a distant issue.

However, one should keep in mind that global warming is more a question of stock (the impact of the accumulation of greenhouse gases emitted since the industrial revolution) than of flow (the impact of annual emissions): We are already observing the impact of historical emissions on the intensity and on the frequency of extreme events all over the planet. In 2023, for the fourth year in a row, insured losses due to natural disasters exceeded 100 billion dollars globally.

**With this first publication on adaptation to climate change, the EDF group is guided by three key aims: understand, inform, act.**

— **UNDERSTAND:** EDF group can rely on a strong R&D, with 2,000 researchers and a dedicated climate service, working closely with the academic world to assess the impact of the

latest climate scenarios on our assets, whether they are existing or in development.

— **INFORM:** Because no one can achieve resiliency alone, we want to share this knowledge with our stakeholders and contribute to the collective adaptation of the communities and of the regions where we operate.

— **ACT:** Adapting to climate change will require all types of innovative solutions, whether they be technical or nature-based, high tech or low tech. But in a world where the only thing for certain is the increase of uncertainty, we shall make sure to always be able to adjust our activities to evolving climate conditions.

**Our aim is to build a resilient electricity system helping the world to achieve net zero by 2050. This is the challenge of a generation: Join us!**

***“The ambition of our generation is to build a robust electricity system which will help us to achieve carbon neutrality in 2050. Join us!”***



# COMMIT

## PAST AND PRESENT

From the publication of the 1<sup>st</sup> IPCC<sup>®</sup> report in 1990, the EDF group has decided to develop an internal R&D expertise on climate science.

**1946**

Creation of the DTG<sup>®</sup> to deploy a network for taking hydrometeorological measurements (snowfall, rainfall, river flow, etc.) which today consists of 1,100 measurement stations managed in partnership with Météo-France.

**1970**

EDF equips itself with hydrometeorological forecast centres, located in Grenoble and Toulouse, to optimise hydroelectric power generation and anticipate high water levels.

**1990**

The Scientific Council of EDF recommends the launch of an R&D program to assess the impacts of climate change on the Group's activities.



**2003**

1<sup>st</sup> Climate-Related Hazards Plan (Plan Aléas Climatiques) and creation of a water coordination body in 2004 (transverse mission entrusted to EDF Hydro which allows interactions between production fleets concerning access to water resources to be managed).

**2006**



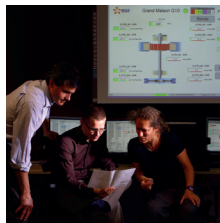
Drawing up of the first Extreme Heat safety guidelines (Référentiel de sûreté Grands Chauds), redefining the maximum air and water temperatures to be taken into consideration for periodic reviews of nuclear power plants on a regular basis.

**2010**

Group's 1<sup>st</sup> adaptation strategy

**2014**

Creation of the climate service at EDF R&D



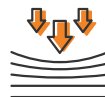
**2017**

The EDF group is one of the first companies to commit to applying the recommendations of the TCFD<sup>®</sup> in terms of climate reporting.



**2018**

Climate risk is recognised as priority risk by the Group.



**2020**

Launch of the Group's Resilience project



**2022**

The adaptation plans of 12 entities of the Group are validated.

**2021**

New CSR<sup>®</sup> policy  
All Investment projects over 60 million euros shall include an analysis of the impact of climate change in their screening.

**2023**

The EDF group obtains the best score among the first 13 companies which volunteer to test the ACT<sup>®</sup> adaptation method developed by ADEME.







## A recognised leadership



**2015**

At COP21, EDF receives a UNFCCC prize in the category “innovative solution for adaptation to climate change”.



**2020**

EDF is validated “Well below 2°” by SBTi.



**2022**

EDF features on the CDP Climate Change A List for the 6<sup>th</sup> time.



**2024**

EDF is validated NZ-2 by Moody's, with a CO<sub>2</sub> emissions reduction trajectory aligned with the 1.5°C ambition.



**2024**

EDF's Implied Temperature Rise (ITR) is assessed at 1.3 °C by MSCI.

# COMMIT

## WITH STRONGER CLIMATE GOVERNANCE

*“Build a Net Zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development.”*

Within the framework of its CSR® policy the EDF group is committed to **assessing** the impacts of climate change on its activities, to **adapting** its existing facilities to make them less sensitive to climatic conditions and more resilient to extreme situations, and to **taking climate change hypotheses into account** in the design of its new facilities.

The **adaptation plans of EDF entities** operating infrastructures with technical lifetimes of over 30 years (nuclear, hydroelectric, distribution network) or with a specific sensitivity to climate events (e.g. infrastructures operated in tropical islands, solar panels) are approved by **the company's executive committee**.

### Climate governance at the highest level of the company

Since 2020, the EDF group has implemented a new **Climate-related governance** within its Executive Committee and Board of Directors and has taken climate criteria into account in the variable remuneration of its directors, in keeping with the best TCFD® standards.



The EDF group's first climate transition plan, including adaptation, was adopted as “Say on Climate” at the General Shareholders' Meeting in May 2022 with a majority of 99.87 % of votes.

#### BOARD OF DIRECTORS

*It deliberates on the Group's strategic, financial and economic policies taking risks and opportunities related to climate change into account.*

○  
**CORPORATE RESPONSIBILITY COMMITTEE**

○  
**CLIMATE POINT PERSON**

*Also exercises the function of Chairperson of the Corporate Responsibility Committee of the Board of Directors.*

#### EXECUTIVE COMMITTEE

*It defines and implements the EDF group's climate strategy.*

○  
**CLIMATE POINT PERSON**

- **THE CSR STRATEGY COMMITTEE** steers the Group's climate strategy.
- **THE RISKS COMMITTEE** ensures that all entities examine climate risks and take them into account in their mapping.
- **THE COMMITMENTS COMMITTEE** examines the alignment of strategic projects with EDF's raison d'être.
- **THE SCIENTIFIC COUNCIL** explains the strategy in the light of advances in scientific knowledge.
- **THE STAKEHOLDER ADVISORY COMMITTEE** is a voluntary and multi-disciplinary group which reports back on the expectations of civil society.

## THROUGH DIALOGUE WITH OUR STAKEHOLDERS

**The Stakeholder Advisory Committee** is a **multi-disciplinary gender-equal** committee which brings together a dozen volunteers representing civil society who provide their views on the EDF group's strategic directions in relation to CSR®.

It currently counts **two climate scientists** among its members: Valérie Masson Delmotte and Christophe Cassou. In 2022, the Group's strategy and actions in the area of adaptation to climate change were presented to the Stakeholder Advisory Committee.



FIND OUT MORE  
CONSULT THE FULL LIST OF  
MEMBERS OF THE STAKEHOLDER  
ADVISORY COMMITTEE



*A word from  
members of  
the EDF group's  
Stakeholder  
Advisory  
Committee*



**"Companies are taking these changes on board. Some of them have understood that broad declarations of intent no longer serve any purpose, that they really had to put in the groundwork. This raised awareness is having an impact at all levels of management: boards of directors are becoming better and better at getting to grips with the challenges of climate change and younger employees are very attentive to climate issues. When the same concerns are shared at both these levels, things can really change."**

**Valérie Masson-Delmotte**,  
Paleoclimatologist, researcher  
at the CEA, member of France's  
High Council on Climate, Chair  
of IPCC Working Group I until  
July 2023.

*"The scale of future changes and of the risks for ecosystems and human societies depend on the decisions we make today. Any further delay in taking concerted and joint global action will result in us missing the small window of opportunity that is still open to us to ensure a viable future."*

**Christophe Cassou**,  
Climate scientist and  
researcher at the CNRS.



EDF is working with those actively involved at local level to build a common vision of the challenges of adaptation to climate change.



In 2023, the EDF's Nuclear and Thermal Power Generation Fleet department participated in the creation of the **Habitability of surrounding localities** ("Habitabilité des Territoires") Chair associated with the ESSEC Business School's Chair of Urban Economy. The purpose of this chair is to work on the management of common goods and on resilience with localities where EDF's power generation facilities are located.

**The EDF group contributes actively to regional initiatives** such as the regional IPCCs and the adaptation plans for basins or land masses.

# ANTICIPATE

8

Adaptation to climate change raises two major challenges: **the uncertainty** concerning fluctuations in climate, requiring different scenarios to be taken into consideration, and **the lack of any universal metric** to characterise the notion of resilience, in contrast to that for CO<sub>2</sub> emissions which allows all mitigation strategies to be defined and compared. It is for these reasons that **the regulatory framework** for adaptation, in particular for companies, is much less advanced than that for mitigation.

In the early 2000s, the EDF group **proactively** decided to equip itself with skills, as well as an organization and a strategy at **Group level** and then to deploy this approach with risk mapping and adaptation plans at the **level of entities**.

The EDF group's adaptation approach anticipates and is fully in line with the deployment of new regulations in the area of adaptation, such as those related to corporate **sustainability reporting** (European CSRD<sup>®</sup> directive) or to the use of a **reference trajectory for climate change adaptation** (*Trajectoire de Référence pour l'Adaptation au Changement Climatique – TRACC<sup>®</sup>*) which considers a scenario of warming of +4°C in metropolitan France compared to the pre-industrial era in 2100.

# BY IDENTIFYING THE RISKS

Entities of the EDF group are required to assess their climate risks on an annual basis.

This assessment covers both their physical risks, covered in this brochure, and their **transition risks**®.

To assess the impact of climate change on the supply of electricity, it is necessary to go beyond the operation of each individual power plants and to consider the operation of the full electric system, **including the supply and demand balancing**.

## Assess the physical risks

The assessment of the physical risks for a facility requires the identification of **three components: the climate hazards, the level of exposure and the vulnerability of the facility**.

The approach implemented at EDF group level is based on the notion of “**double materiality**”, taking into account both the risks for the company and the risks for stakeholders.

## Distinguish between safety issues and loss of production

**Nuclear safety frameworks** already take into account climate change. Climate hazards are thus re-assessed on a regular basis and prior to each ten-year outage. They are addressed in the safety demonstrations validated by the French Nuclear Safety Authority (ASN®). In addition, nuclear plants are subject to environmental standards. Their water discharge shall comply with strict criteria, specific to each site and aiming to limit the impacts on the downstream aquatic environment. In a context of climate change, the availability of certain sites may be impacted. Ad hoc studies conducted by EDF are presented in the section Water & Energy nexus.



 **FIND OUT MORE**  
CONSULT THE FRENCH COURT OF AUDIT'S  
REPORT ON ADAPTATION, 2024

	Climate hazards	Potential impact on operations
<b>Chronic risks</b>	Rise in temperatures	● Decrease in hydroelectric output; decrease in the thermodynamic efficiency of facilities; proliferation of organisms resulting in clogging of water intake; development of microbes in the cooling systems; risk of submergence of structure located by the sea.
	Sea level	● Decrease in the capacity of transmission lines.
	Average rainfall	● Decrease in demand for heating, increase in demand for air conditioning.
<b>Acute risks</b>	Heatwaves	● Decrease in nuclear output to comply with environmental regulations; low water levels at dams; accelerated ageing of materials.
	Drought	● Decrease in capacity of networks, risk of fire. ● Increasing insurance costs, worse working conditions for employees and service providers.
	Extreme rainfall events	● Damage to or temporary outage of means of generation, more intense impact of high water levels.
	Storms	● Power cuts.
<div> <span>● PRODUCTION</span> <span>● TRANSPORTATION AND DISTRIBUTION</span> <span>● MARKETING</span> <span>● ALL PROFESSIONS</span> </div>		

# ANTICIPATE

## ACROSS ALL THE GROUP'S BUSINESSES

Not all entities of the EDF group are exposed in the same manner to the physical impacts of climate change. This is why the EDF group has chosen to entrust each of its main businesses with the responsibility of drawing up its own adaptation plan, with a **coordinating body at Group level.**

### EDF RENEWABLES' ADAPTATION PLAN

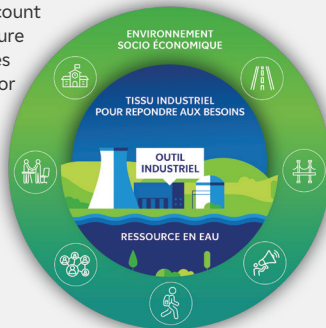


EDF Renewables' adaptation plan aims to gain a finer grasp of the climate risks related to the development of solar and wind power and storage projects, particularly in terms of exposure to **extreme events** (storms, floods, etc.) and to **adapt assets accordingly** (resistance of electronic equipment to heat, drainage system and waterproofing, etc.).



### THE ADAPT PROGRAMME

Climate change has been taken into account in the safety of EDF's nuclear facilities for over 20 years now. **The ADAPT project was created to understand and assess the consequences of climate change on EDF's nuclear and thermal power plants. It takes the systemic nature of its impact on the socio-economic environment and at local level into account in its action plans.** The project goes beyond the engineering work on industrial facilities to take account of the systemic nature of the consequences of climate change for the socioeconomic environment of EDF power plants at regional level.



### THE ARCHE PLAN

**The ARCHE (Adaptation et Résilience Climatique de l'Hydro à EDF [Climate Adaptation and Resilience of Hydroelectric Power at EDF]) plan is the adaptation plan for EDF hydroelectric power generation.** Its objective, beyond preserving the safety of facilities and people, is to maintain economic and environmental performance and to anticipate challenges related to multi-use water management.



*La Ravière Dam, view from upstream, creation of a flood discharge system in the form of Piano Key Weir (PKWeir).*

### ADAPT DISTRIBUTION NETWORKS



Enedis is the main operator of the national electricity distribution network in France and is managed independently of EDF. Enedis updated its Climate Adaptation Plan in 2021. The aim of this plan is to enhance the reliability of 20,000 km of overhead medium-voltage networks between 2019 and 2032. Within the framework of this plan, Enedis is in particular laying 98 % of new medium-voltage lines underground, replacing a large proportion of the "bare wire low-voltage" lines and installing waterproof equipment in floodable areas.



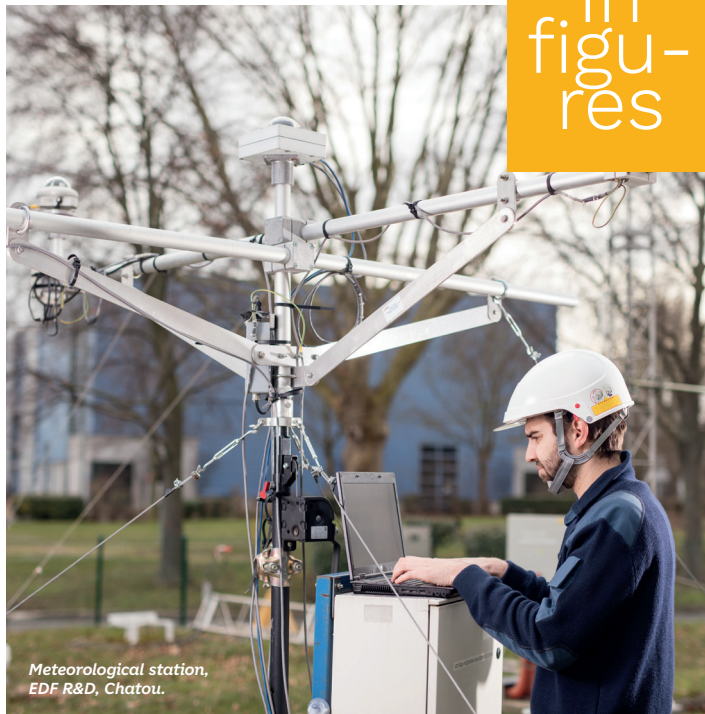
# ANTICIPATE

## WITH THE CLIMATE SERVICE

Following the publication of the 1<sup>st</sup> IPCC® report in 1990, the EDF group made the choice to develop an internal expertise on climate systems modelling, in collaboration with leading organisations in the field such as Météo-France and the Institut Pierre-Simon Laplace. The only one of the major electricity companies to have such a structure, EDF group has its own **Climate Service since 2014**, operated by EDF R&D and in collaboration with the other Group's engineering divisions.

### *Its role?*

The EDF climate service acts as a gateway between climate science, which is constantly progressing, and the Group's business units. It does not develop new global climate model (GCM) but instead analyses the data available from twenty or so existing international models and translates them into relevant indicators for EDF infrastructures. For these impact and dimensioning studies, EDF systematically considers several **emissions scenarios, with a time horizon up to 2100, and including at least one of the more emitting and hence pessimistic scenario (i.e SSP3-7.0 or SSP5-8.5®).**



In  
figu-  
res

Around 20 climate researchers, forecasters and hydrologists are constantly working to estimate the consequences of climate change for all EDF's activities.

### *The Climate Service has three tasks:*

- 1** Make the most recent climate projection data available;
- 2** Develop specific tools and methods to translate these projections into indicators which are relevant and local to where our facilities are located;
- 3** Carry out climate impact studies at the request of Group business units, ensuring consistency in the methods and assumptions used.

# ANTICIPATE

## UNDERSTAND THE SUPPLY/DEMAND BALANCE

In the medium term, the energy transition is going to lead to a major upheaval in the way electricity is produced and consumed. **Assessing and anticipating the impact of these structural changes in a context of climate change** is thus crucial in order to guarantee a sustainable balance between supply and demand.

### *A modification in the seasonality of electricity demand*

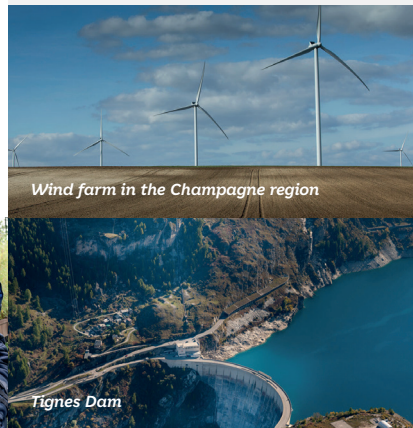
Climate change is going to result in a **decrease in consumption for heating in winter and an increase in consumption for air conditioning in summer**. However, even with high rates of equipment, air conditioning consumption will remain relatively low on an enduring basis, well behind consumption for heating. Moreover, with optimised management, air conditioning in summer will ideally be able to be coupled to local or centralised solar power generation.



EDF is promoting solutions adapted to climate change to its customers. Combined with passive cooling solutions, reversible air/air heat pumps are very efficient when used for heating in winter and for cooling in summer: these consume half as much as mobile air conditioning units.



### *An increased sensitivity of the electricity system to exceptional weather events*



The **development of renewable energies** will make the electricity system more sensitive to variations in wind and sunlight. Over the decades to come, the nature of the risk concerning the security of supply of electricity will change with periods of tension which will mainly occur during periods combining low temperatures with no wind.



EDF is contributing to securing the supply demand balance by 2050 in a context of increased sensitivity to exceptional weather events thanks to dispatchable low-carbon (nuclear and hydroelectric) power generation and to the development of flexibility solutions.



**FIND OUT MORE**  
"WHAT IMPACT IS CLIMATE CHANGE GOING TO HAVE ON THE FRENCH ELECTRICITY SYSTEM?"



# ANTICIPATE

## WITH NEW NUCLEAR

The French nuclear sector is preparing for the **construction of a nuclear programme of 6 EPR2 reactors** as a firm commitment and 8 other reactors as an option, according to the orientations set out by the President of the Republic in his speech at Belfort on 10 February 2022.

### *Climate criteria taken into account in the choice of sites*

Two of the three first sites to be chosen by EDF to build France's new nuclear reactors are located by the sea. The third site is located by the Rhône, France's most powerful river in terms of flow rate. New reactors built by rivers are **systematically equipped with cooling towers**.

### *EPR2 reactors designed to be resilient to climate change over their entire 60-year operating lifetime*

For parameters whose change can be forecast such as **the high sea level or warm temperatures**, the dimensioning is based on models using the IPCC's conservative climate scenarios. Design margins are also taken into account to cover uncertainties related to changes in knowledge or future climate trends.



EDF envisages a gradual commissioning schedule: by 2035-2037 for the first pair of reactors at Penly (Normandy), 2038-2039 for the second at Gravelines (Hauts-de-France) and 2040-2045 for the third at Bugey (Auvergne-Rhône-Alpes). Considering the operating lifetime to be 60 years, at least some of these sites will thus still be in operation beyond 2100.



*Penly nuclear power plant, Seine Maritime (simulation).*

### **DID YOU KNOW?**

There are nuclear power plants which operate in a desert climate. The Palo Verde power plant, for example, was commissioned in the USA in the 1980s. What makes it specific is that it is not located either by a river, or on the coast but in **the middle of the desert in Arizona**. Wastewater from the treatment station for the City of Phoenix, located around forty kilometres away, is treated and re-used to cool the three reactors.

# WATER

**Freshwater, an essential resource for ecosystems functioning** and for many other human activities, is going to be subject to growing tension under the double effect of the increase in water demand and climate change. Renewable water resources have already decreased by 14% in the past 20 years, with strong seasonal and regional variations in metropolitan France.

**EDF Groupe faces a double challenge due to the change in water resources.** The generation of EDF's electricity is highly dependent on water, in particular its controllable capacities of generation and storage of low-carbon electricity, which are indispensable for the energy transition. The Group is also a key player in the management of water in France.

A few water management challenges facing energy production due to climate change are listed below: water efficiency and sufficiency, environment conservation, multi-use water management, water storage and flexibility of power generation plants.

# A CENTRAL CHALLENGE FOR POWER GENERATION

EDF's generation of electricity in France is nearly 90% dependent on water resources:

- either **directly** for hydroelectricity.

→ EDF envisages a decrease in hydroelectric power generation related to climate change of around 1 TWh per decade (equivalent to around 2.5%) with strong regional and seasonal variations\*.

- or **indirectly** for the cooling systems of the nuclear and thermal power plants.

→ French nuclear production losses related to water resources currently remain below 1% of the annual production, except in 2003 (exceptional heatwaves). EDF estimates that these losses will remain limited to 1.5% by 2050 (at constant production capacity).

\*This trend is to be considered in relation to the natural variability in water resources with high annual difference in production, between dry and wet years of up to 20 TWh, corresponding to 50 % of EDF hydroelectricity production in France.

## A resource permanently monitored by the DTG®

The monitoring and forecast services of the General Engineering Division (Direction Technique Générale - DTG) based in Grenoble and Toulouse help to optimise the generation of electricity in relation to hydro-climatic conditions:

- Permanent monitoring of the environment based on a network of measurement stations specific to EDF facilities: river discharges, rainfall, water and air temperatures, snow cover, etc.
- A powerful digital hydrological forecast model developed by EDF
- For a permanent analysis of the hydrological situation at different time steps: from several hours for flood management to seasonal forecasts to prepare for low water periods, anticipate the filling of reservoirs, etc.

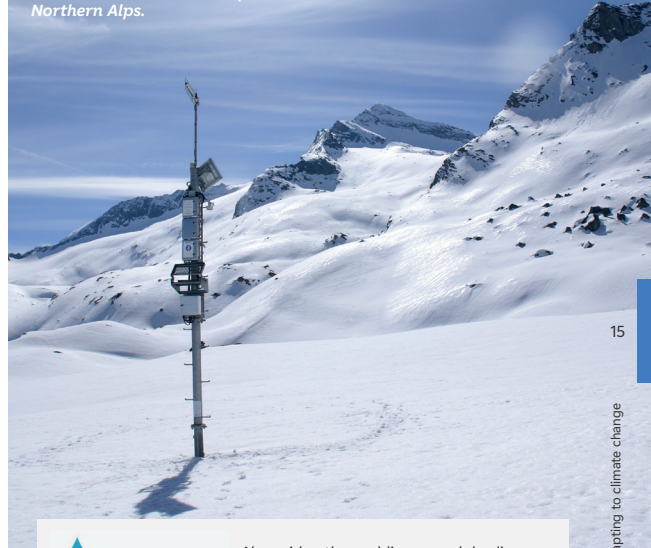


1,100 hydro-meteorological stations in operation

## A cross-functional water management body

Given these challenges and the effect of climate change on water resources, since 2004 (after the heatwave of 2003), the Group has set up a water management coordinating body which also follows the challenges related to climate change and biodiversity.

The Cosmic Radiation Snow Gauge (Nivomètre à Rayonnement Cosmique - NRC) measures the water amount in the snowpack, Northern Alps.



Alongside other public research bodies (INRAE, MétéoFrance, etc.), EDF R&D is involved in the national EXPLORE 2 project, which is studying the change in water resources between now and 2100.



FIND OUT MORE  
R&D HIGHLIGHTS



# WATER

## CHALLENGES RELATED TO WATER EFFICIENCY & SUFFICIENCY

In response to the action plan for resilient and coordinated water management ("*Plan d'action pour une gestion résiliente et concertée de l'eau*") implemented in 2023 by the French Government, all of the Group's activities in France are committed to water saving plans. Within this framework, the nuclear and thermal plants Department (*Direction du Parc Nucléaire et Thermique - DPNT*) has implemented a Water Plan. Its ambitions are to:

- **Reduce the use of industrial water® by 10% by 2030**, excluding the water needs for nuclear safety and for cooling systems.
- Improve water quality.
- Guarantee the resilience of the nuclear fleet during periods of extreme heat and low water levels.
- Help to conserve water for biodiversity and other uses.



← FIND OUT MORE  
WATER PLAN

EDF, PARTNER OF THE "ECO D'EAU"  
WATER SAVING INITIATIVE



### The challenge of cooling systems

**Water is essential for the operation of the 3 main water circuits of a nuclear power plant, including the cooling system which needs to use water withdrawn from a river or the sea.**

In an open cooling circuit, the water intake is large but this water is fully restored to its original environment (major river or sea).

In a closed cooling circuit, the water intake is much lower but some of the water evaporates as it passes through the cooling towers.

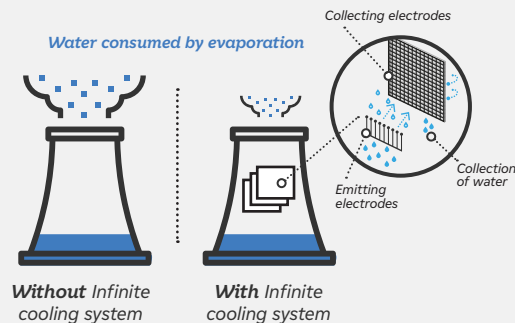


### EVERYONE PLAYS THEIR PART

Framatome, a subsidiary of EDF, has committed to reducing its consumption of drinking, underground and surface water across all of its industrial sites. On the Montbard site, a major rainwater storage reservoir has been installed, capable of covering 3 months of operation without pumping any surface water.

### INNOVATE TO SAVE

As part of the ADAPT project, EDF has committed to an experimental trial on a test facility at the Bugey NPP (Nuclear Power Plant), to test the recovery of part of the water contained in the plumes of the cooling towers.



An R&D partnership with "Infinite Cooling", a startup from MIT (Massachusetts Institute of Technology).

### The EDF group withdraws significant amounts of water but consumes less:

- 97% of the freshwater withdrawn by EDF is restored to the natural environment.
- The energy sector is the third largest consumer (12%) after agriculture (58%) and drinking water (26%).

# CHALLENGES RELATED TO FLEXIBILITY

To generate electricity in very tense climate situations, **the Group relies on the diversity and flexibility of its generating facilities.** This allows EDF to adjust the electricity production to the demand in a responsive manner according to consumption forecasts.

Reservoirs are thus going to have an increasingly important role to play with different periods and modes of filling/emptying, which is why it is important to study opportunities for increasing storage capacities, in particular by raising the height of dams and building new pumped storage power plants (STEPs)®.

## Manoeuvrability of the energy mix



**The control of the electricity system requires greater flexibility to manage variations due to the renewable energies (wind, solar power).**

In response to these growing needs for balancing, EDF is developing a bouquet of solutions to meet these requirements within different time frames.

In practice, meeting these needs for greater flexibility relies on continuing the development of hydroelectric power (including STEPs), the capacity of current and future reactors to modulate production (EPR2) and the use of batteries. In 2018, the Group decided to develop more than 10 GW of storage capacity by 2035



Flamanville nuclear power plant.

## INNOVATE TO STORE

The construction of new **pumped storage power plants** (*Stations de Transfert d'Énergie par Pompage - STEP*s) will make it possible to increase energy flexibility and to limit the flexibility lost by sustaining low water levels, while preserving water resources. Pumped storage power plants (STEPs) operate in a “closed circuit”, as the water is reused between two upstream and downstream reservoirs. They help to balance generation and consumption of electricity.



STEP de Grand'Maison située dans les Alpes.

- EDF operates 6 pumped storage power plants (STEPs) in France with a 5 GW total capacity.
- In France, the multi-year energy programme (*Programmation Pluriannuelle de l'Énergie - PPE*®) plans the development of pumped storage power plants (STEPs) to provide a potential capacity of 1.5 GW with the commissioning of facilities planned between 2030 and 2035.
- Around 14 GW of hydroelectric power can be mobilised in less than 13 mins, including 5 GW of capacity from pumped storage power plants (STEPs).



**FIND OUT MORE**  
**Pumped storage power plants (STEPs)**



# WATER

## CHALLENGES RELATED TO MULTI-USE WATER MANAGEMENT

With increasingly intense periods of drought, water is now more than ever before becoming a resource to be shared. As a major hydroelectricity producer, EDF further enhances its anticipation of water management and storage to preserve this low-carbon electricity production (which represents 10% of the French energy mix on average).

### Water, a common good

EDF does not decide on how water is used and nor does it regulate its uses. They are the subject of consultation between the various stakeholders under the supervision of the French State.

- EDF is a major manager of freshwater in France with around 6 Bn m<sup>3</sup> of stored water, a shared good (effective water storage capacity of EDF lakes, 2023).
- Around 2/3rds of hydropower concessions are used for other purposes than hydroelectric power (irrigation, drinking water supply, tourist activities, etc.).
- EDF participates in numerous water committees (the French national water committee [Comité National de l'Eau], water basin committees [Comités de Bassins], the Board of Directors of Water agencies [Conseil d'Administration des Agences de l'eau], local water commissions [Commissions Locales de l'Eau], drought committees, etc.).

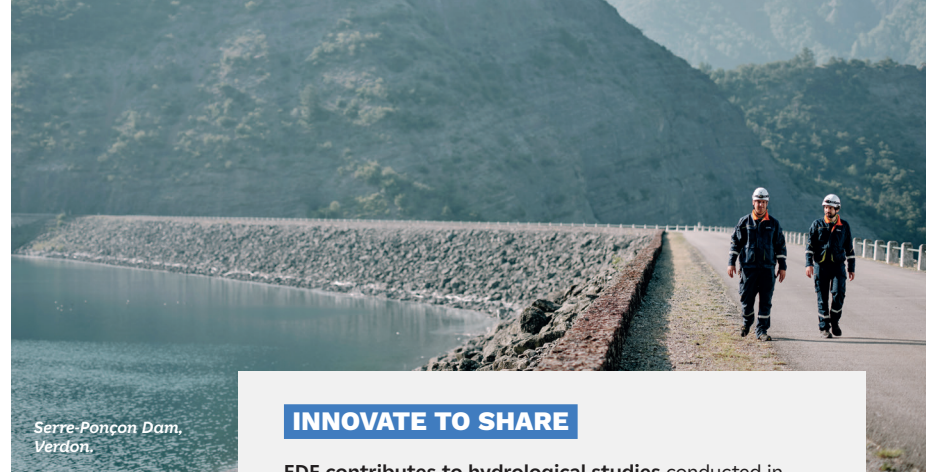
### A balance to be struck

Due to climate change, periods of low water levels are set to be longer and more severe, leading to an increasing need to sustain water needs for human activities, with the risk of de-optimisation of hydroelectric and nuclear power generation\* where EDF reservoirs are used to sustain low water levels.

**The current balances are going to change, with 2 major challenges:**

- **sustain water levels during periods of low water** from hydropower reservoirs (adaptation factor),
- **keep the low-carbon generation capacity** of the hydropower plants and preserve its flexibility (mitigation factor).

\*less power generated or generation at a time which is not optimal in relation to the needs of the electricity system

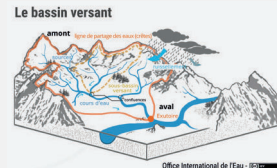


Serre-Ponçon Dam, Verdon.

### INNOVATE TO SHARE

EDF contributes to hydrological studies conducted in the different basins by France's water agencies (*Agences de l'eau*), regional departments for the environment (*Directions Régionales de l'Environnement - DREALs*) and local water basin institutions (*Établissements Publics Territoriaux de Bassin - EPTBs*), to share data and envisage changes.

In addition to these studies, **EDF has initiated the development of digital twins of river basins**, starting with the Loire. The aim is to model the impact of different climate change scenarios on water resources and on water uses. The objective is to gain a better understanding of how the basin operates for the benefit of water sharing.



**Digital twins for forward planning and consultation to improve water sharing**

# CHALLENGES RELATED TO WATER QUALITY

On all of its thermal and nuclear plants, the operator ensures compliances with the discharge limits authorised by the French regional departments for the environment, land planning and housing [*Directions Régionales de l'Environnement, de l'Aménagement et du Logement - DREALs*] (thermal fleet) or the French nuclear safety authority [*Autorité de Sûreté Nucléaire - ASN*] (nuclear fleet). Continuous environmental monitoring of the quality of aquatic ecosystems are carried out to check that there are no significant impacts on the environment due to power generation sites. Over 10,000 quality control and environmental monitoring analyses are carried out every year, on each NPP®.

## Monitor and control the warming of water courses

The technology of cooling towers for closed-circuit power plants allows the warming of water courses to be reduced significantly, to just a few tenths of a degree.

## Anticipate the impacts of climate change on biological communities

The influence of the increase in the temperature of water on aquatic ecosystems is a major topic of research. Data from long-term monitoring, conducted as part of multi-year research programmes in thermo-hydrobiology since 2008, are being used for different scientific partnerships. These data are valuable observations of the aquatic biodiversity changes in large French rivers. The analysis show that thermal discharges from power plants did not have significant influence on fish populations, mainly impacted by climate change.



### A new research program in thermo-hydrobiology (2023 - 2027)

- The aim is to study the effect of the increase in temperature due to climate change combined with other disruptors (including chemicals)
- It includes studies of marine environments and coastal ecosystems.

## Nature-based Solutions (NbS) for adaptation



They are considered by the UN to be future solutions for the mitigation of climate change and for the preservation of biodiversity. EDF is committed to several NbS projects such as for example:

### Plantation of Riparian woodland

In 2024, EDF began a Riparian woodland plantation programme (vegetation alongside a water course) upstream of the Golfech NPP (near Toulouse, in the Tarn et Garonne). The objective is to contribute both to the regulation of the temperature of the water course and to the creation of local areas of shelter allowing a gain in biodiversity.



### Tact reservoir

The Tact reservoir ecological engineering project (in the Cantal) aims to enhance the water quality inside and downstream of the reservoir. The creation of a vegetation covered embankment inside the reservoir slows down the water flow, thus improving decantation and recreating a kind of wetland, whose phyto-purification role is enhanced by the addition of local plants. This project has been labeled "Solution Fondée sur la Nature" [Nature-based Solution - NbS] by the Adour-Garonne water agency (Agence de l'Eau Adour-Garonne) and selected by the French Water Plan as one of its flagship 14 Nature-based Solution projects.



In France, as abroad, **the effects of climate change are already noticeable**: 2022 and 2023 were the hottest years in France since 1850 and 2023 has been confirmed to be the hottest year globally since records began.

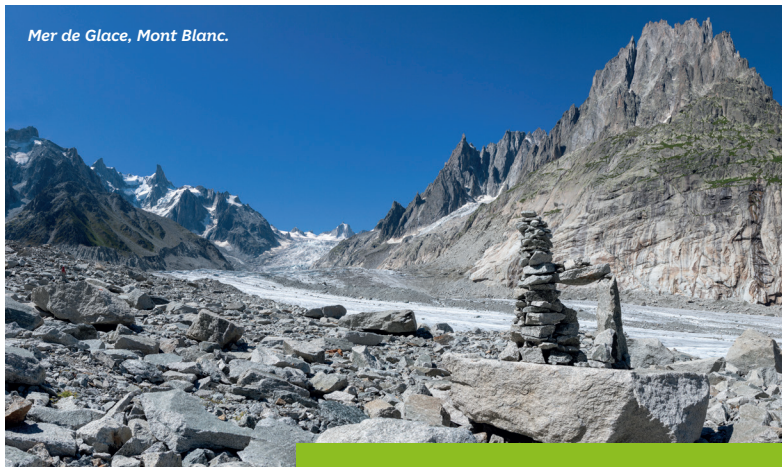
Climate change in particular results in more frequent and more intense **heatwaves**, more periods of **drought**, **lower water levels** in summer, an acceleration in the rise in **sea level** and the retreat of glaciers, as well as more extreme **rainfall** events.

It leads to situations which sometimes have **catastrophic results**, such as large-scale forest fires, floods in previously unaffected areas, unusually powerful cyclones in tropical zones, impacting populations, natural environments and economic activities.

A few non-exhaustive examples of **concrete adaptation actions** taken by the EDF group to address these already observable consequences of climate change are provided in this section.



# RETREAT OF GLACIERS



Mer de Glace, Mont Blanc.

## UNDERSTAND

The Mer de Glace is the largest glacier in France: it is 11 kilometres in length with an area of 30 km<sup>2</sup> of ice extending above Chamonix on the North slope of Mont-Blanc

In  
figu-  
res

In 25 years, the glacier has retreated by 800 metres and lost 100 metres in thickness

## ADAPT

- In 1973, EDF installed a water collection station under the glacier to recover the natural seasonal meltwater from the glacier in spring and summer. This glacier water is then fed through turbines to the Les Bois power station, near Chamonix, where it allows EDF to generate the equivalent of the domestic consumption of a town the size of Chambéry every year.
- The retreat of the glacier already led EDF to move the water intake 800 m upstream in 2011. However, the acceleration in climate change is exposing the existing catchwork (at 1560 m of altitude) to the risk of obstruction related to the falling of large blocks of ice, flooding or avalanche, which would put it out of service for the long term.



EDF is anticipating the continuing retreat of the glacier by modifying the installation between now and the end of 2024, with the restoration of an old underground catchwork (at 1520 m of altitude) and its transformation into a surface catchwork, thus preserving the environment of the site and enabling a gentle transition without any loss of hydroelectric power generation.



FIND OUT MORE  
[Les Bois water intake](#)



## COOPERATE TO ANTICIPATE



EDF is carrying out prospective studies to quantify the effects of glacial retreat on water resources in the Alps and is co-financing certain measurement campaigns being carried out by the glaciologists from the Institute of Environmental Geosciences (*Institut des Géosciences de l'Environnement - IGE*).

A collaborative approach with our partner, the IGE



# ACT

## RISE IN SEA LEVEL



Hinkley Point C nuclear power plant (United Kingdom).

### UNDERSTAND

Observations from tide gauges and altimetric satellites show that **sea levels are rising increasingly quickly**. In the 20<sup>th</sup> century, the sea was rising at a rate of 1.4 mm/year. Now it is rising at a rate of 4 mm/year.

In  
figu-  
res

Beyond 2°C, the speed of the rise in sea level could reach a global average of 1 cm/year after 2050.

### ADAPT

- The most recent nuclear power plants built by the EDF group (Flamanville 3) or under construction (Hinkley Point C and Sizewell C) have all been dimensioned taking into account forecasts of the rise in sea level corresponding to the IPCC ⑥ worst-case scenario and even incorporating an additional margin.
- Thus for the Hinkley Point C power plant (Somerset, United Kingdom), a concrete sea wall of 13.5 metres in height has been built to the east and west of the station to protect the coastline from erosion and coastal flooding related to the change in the amplitude of spring tides, storm surges and combined wave action.



The nominal lifetime of this structure is 100 years, so as to cover both the period of operation of the power plant and the dismantling phase. Its design allows a subsequent rise to be envisaged if climate change should prove to be even faster than expected.



FIND OUT MORE  
*Hinkley Point C*



### COOPERATE TO ANTICIPATE

EDF R&D sits on the scientific committee set up in 2023 by the French Minister for the ecological transition and steered by the French geological survey (*Bureau de Recherche Géologique et Minière - BRGM*) to define the national trajectories of rise in sea level to take into account a reference warming trajectory for climate change adaptation (*Trajectoire de Réchauffement de référence pour l'Adaptation au Changement Climatique - TRACC ⑥*).

FRANCE  
NATION  
VERTE   
Agir • Mobiliser • Accélérer

# INCREASE IN THE FREQUENCY AND INTENSITY OF HIGH WATER LEVELS



PKWeir technology in use at the Groupe d'Exploitation Hydraulique Tarn Agout, Vallée de l'Agout.

## UNDERSTAND

High water is a natural phenomenon which consists of an **increase in the rate of flow in a water course**, leading to a rise in the water level. High water levels may lead to floods when the water escapes from the bed of the water course and invades nearby land.

**Climate change increases the risk of precipitation:** the warmer the air is, the more water vapour it contains which can potentially transform itself into heavy rains. Heavier rains are already being observed in certain regions of France, in particular in the autumn.

## ADAPT

- The EDF group has installed an innovative technology developed EDF R&D called the “Piano Key Weir” (PKWeir) on a dozen or so of its hydropower structures. This technology allows a quantity of water which is 3 to 4 times larger to be discharged over the same discharge height without having to increase the size of the dam. This innovation received an award at COP21 in Paris in 2015.
- EDF has also developed a method for the management of high water levels allowing it to operate its hydroelectric facilities in a way which is even more robust at withstanding climate hazards. The new algorithm (called the Linear Trajectory [“Trajectoire Linéaire®”]) has been tested and applied successfully to the series of hydroelectric facilities on the Verdon river.

FIND OUT MORE

Piano Key Weir



Le Gage Dam



Malarce Dam



## COOPERATE TO ANTICIPATE

With scientific partners such as the CNRS and INRAE, EDF has started to work on the development of new stochastic methods which take the most recent hydro-climatic observations into account in order to estimate the impact of climate change on flow rates during periods of extreme high water levels.

These methods allow regular re-assessment of reference high water levels which are then used in hazard scenarios to dimension the flood discharge systems of EDF's hydropower structures.

# ACT

## INCREASE IN THE INTENSITY OF CYCLONES



*In January, Cyclone Belal left 35% of inhabitants of the Île de la Réunion without electricity. In less than 48 hours, EDF was able to re-connect 90% of customers.*

In  
figu-  
res

According to the IPCC's most recent report, the proportion of category 4 or 5 tropical cyclones could increase by 20% by 2100 under a global warming scenario of 4°C.

## UNDERSTAND

Cyclones are swirling weather phenomena which form over the ocean between the tropics and the equator. They are typically classified into 5 categories depending on maximum wind strength and the scale of the potential damage. Around 80 cyclones form around the globe every year.

As a effect of climate change, the ocean, like the atmosphere, is warming. Researchers have established that this would result in cyclones which are more intense (with more energy) and result in heavier rainfall (due to the atmosphere containing more humidity). There should not be any change in their frequency however.

## ADAPT

- On French island territories, in addition to its electricity generation activities, EDF also plays the role of network operator and is responsible for the transmission and distribution of electricity. The risk of cyclones is considered to be major for this infrastructure, in particular for the Antilles (Martinique, Guadeloupe, Saint-Martin et Saint-Barthélemy) for La Réunion.
- The networks in French overseas territories have been constructed in accordance with regulations which have placed increasing emphasis on criteria of the mechanical strength of structures to withstand climate hazards. Their mechanical resistance to powerful cyclones is being studied with a view to carrying out reinforcement works.

EDF IES (Island Energy Systems) is working to make the network less sensitive to cyclone risks by taking three main types of action:

- Systematic burial of newly laid medium-voltage networks, in particular when connecting renewable power generation facilities;
- Progressive burial of existing medium-voltage networks depending on their importance for supply to customers;
- Mechanical reinforcement of the high-voltage network at specific points.

The buildings which house electrical facilities (substations) are also built according to cyclonic and seismic standards.



Specific crisis management measures are in place to re-establish power supplies following cyclones and these are re-assessed after each event.

FIND OUT MORE N  
Climate change and  
the consequences in the  
French Antilles



EDF - Cyclones IRMA  
& MARIA





# BE RESILIENT TO STORMS & FLOODS



On 2 October 2020, a Mediterranean episode (Épisode méditerranéen) and the passage of Storm Alex resulted in the greatest destruction in civilian France since the Second World War in several valleys of the Alpes-Maritimes.

## UNDERSTAND

While there is currently no clear scientific consensus concerning the effect of climate change on the change in extreme winds in Europe, an intensification in heavy rainfall has been observed in recent decades in certain regions, in particular with the phenomenon of **Mediterranean episodes**: these are violent storms which occur in the autumn in Mediterranean regions during which the

equivalent of several months of rainfall falls in the space of just a few hours or days. The IPCC's 6th report confirms the expected intensification of these episodes of heavy rainfall if global warming continues to grow and exceeds 2 °C.

## ADAPT

- With 1.4 million kilometres of electricity cables throughout France, the Enedis distribution network covers a distance equivalent to **35 times around the globe and is the largest in Europe**. Enedis is naturally in the front line when it comes to facing up to storms and the effects of climate change.
- This is why Enedis is reinforcing the distribution network, replacing the weakest cables and **burying the power lines most exposed** to climate risks, in particular in wooded areas particularly sensitive to storms and fires.



Created subsequent to the storm of 1999, the Rapid Intervention Electricity Task Force (FIRE) is emergency task force which allows Enedis to mobilise considerable resources in the space of just a few hours when major climate events occur in order to restore electricity to its customers as quickly as possible. The FIRE task force currently consists of 2,500 technicians trained in responding to and dealing with crisis situations and 11 logistical storage platforms located throughout France allowing the deployment of 3,000 generators.



**FIND OUT MORE**  
Helping you out to restore power to the network in an emergency | Enedis



# In figures

With the Rapid Intervention Electricity Task Force (FIRE), Enedis is able to mobilise up to **2,000 people in 24 hours** when an extreme climate event occurs.

ENEDIS is an operator of fully independently managed distribution networks

# ACT

## INCREASE IN THE FREQUENCY AND INTENSITY OF HEATWAVES PROTECT EMPLOYEES



In  
figu-  
res

46,0°C

This is the national record for heat in metropolitan France, recorded near Montpellier during the heatwave of June 2019.

### UNDERSTAND

In France, heatwaves, which occurred on average in one summer every 5 years prior to 1989, have become an annual occurrence since 2000. This frequency is **set to double between now and 2050**.

Exposure to heat has consequences in terms of the **strenuousness** of work related to a direct impact on occupational risks (heart

attacks, dehydration, heatstroke, UV exposure), but also to an **indirect impact**, in particular concerning the psychosocial risks due to tense situations, the risks of accidents related to impaired vigilance, the chemical risks related to the inhalation of volatile substances or even the change in risks related to biological agents (infectious diseases, pollens).

### ADAPT

- The EDF group's **Health & Safety Prevention Policy** includes actions involving medical teams, H&S experts, managers, HR managers, staff representatives and partner companies in a **multi-disciplinary approach** to anticipate the effects of climate change on working conditions: higher temperatures, increase in infectious diseases, UV exposure, extreme weather events.



**Practical information sheets** listing possible adaptation measures have been drawn up by **experts from the Group Health & Safety Prevention Department**. These adaptations may be made at the human (prevention, raising awareness, training, protection of the most vulnerable), organisational (adapted working hours, in conjunction with services provided by local authorities) or technical (sustainable cooling of buildings, suitable personal protective equipment) level.

### COOPERATE TO ASSESS THE IMPACTS ON EMPLOYEES

Experts from the Group Health & Safety Prevention Department are participating in various studies with the World Health Organization (WHO) and with the European Environment Agency (EEA) on the links between climate change and health.

Within the framework of the ADAPT project, a partnership with the Human Adaptation Institute (HAI) has also been launched in 2024 to assess the individual and collective impact of heat on employees and the benefit of mitigation measures on a pilot site.



# ENGAGE AND TRAIN EMPLOYEES

To contribute to the energy transition, EDF is counting on the active engagement of its employees. As a key factor in leveraging involvement, concrete actions are being taken to raise the awareness of 179,550 employees, An initiative which is proving to be successful as, according to the latest internal surveys, **95 % of them declare themselves to be convinced of the importance of the energy transition and of the action being taken by their company (BIPE 2023).**

To onboard employees and develop their skills, EDF is in particular making use of:

→ **The Climate Fresk**, a collective intelligence tool which facilitates the understanding of IPCC reports. As of mid-2024, more than half of the EDF group's employees have received training and 1,800 have put themselves forward as volunteers to be facilitators.

→ **The Climate Day**, organised every two years by R&D to present the progress being made on its work to model the climate and its impacts.

→ **The “Engagés pour la planète”** (*Committed to the planet*) CSR training initiatives: 45 capsules of 5 to 10 minutes each, a 100% digital training programme on the challenges of the ecological transition, which can be accessed on the Group's e-learning platform.



**90,000** employees  
already trained as of  
mid-2024.



“We want all of the company's employees to be aware of our impacts, not only the negative ones with a view to minimising them, but also and above all the positive ones, which have to be maximised.”

*Carine de Boissezon,  
Chief Impact Officer*



EDF encourages its employees to manage their carbon footprint more effectively using the Group's products and services: sustainable mobility, rooftop solar panels, heat pumps. In addition to this, it also organises resource sufficiency challenges to promote the adoption

of eco-reflexes on a day-to-day basis. Other initiatives are also being taken spontaneously such the internal employees group Rhizome. With 1,800 members from EDF, it has joined an extended network of 120 groups from other companies to share best practices.

# GLOSSARY

## ACT

### Accelerate Climate

**Transition:** Initiative of the French Agency for Ecological Transition (ADEME), the CDP and the World Benchmarking Alliance to assess the climate strategies of private actors. The climate change mitigation methodology was supplemented in 2023 by an adaptation methodology for companies.

## ADEME

**French Agency for Ecological Transition** (*Agence de la transition écologique*)

## AMRAE

**French association for the management of corporate risks and insurance** (*Association pour le Management des Risques et des Assurances de l'Entreprise*) ;

## ASN

**French Nuclear Safety Authority** (*Autorité de Sûreté Nucléaire*).

## BRGM

**French geological survey** (*Bureau de Recherches Géologiques et Minières*): France's leading public institution for Earth Science applications for the management of surface and sub-surface resources and risks.

## CEREMA

**French Centre for Studies and Expertise on Risks, the Environment, Mobility and Urban Planning** (*Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement*). France's leading public institution in the supporting the adaptation of regions and local authorities to climate change. In particular, it manages the French national resource centre for adaptation to climate change (*Centre national de ressources pour l'adaptation au changement climatique*).

## CSRD

**European Corporate Sustainability Reporting Directive**, coming into force into 2024.

## DTG

**General Engineering Division** (*Division Technique Générale*), engineering unit of EDF Hydro specialised in measurement and expert assessment for facility monitoring.

## EPR2

Optimised version of the EPR "Evolutionary power reactor": high-power nuclear reactor (1670 MWe) belonging to Generation III+ of pressurised water reactors and developed by EDF and Framatome. The first EPRs were commissioned at Taishan (China), Olkiluoto (Finland) and Flamanville (France).

## IPCC

**Intergovernmental Panel on Climate Change** (*Groupe d'Experts Intergouvernemental sur l'Evolution du Climat* - GIEC in French) operating under the auspices of the United Nations and the World Meteorological Organization. The IPCC's 6th synthesis report providing an overview of the state of knowledge on

the science of climate change, its causes and its impacts was published in 2023.

## INRAE

French National Research Institute for Agriculture, Food and the Environment (*Institut national de recherche pour l'agriculture, l'alimentation et l'environnement*).

## METEO-FRANCE

A public institution whose role is to be the official provider of meteorology and climate science services in France.

## MTECT

**French Ministry for the Ecological Transition and Territorial Cohesion** (*Ministère de la Transition Ecologique et de la Cohésion des Territoires*).

## PNACC

**French National Climate Change Adaptation Plan** (*Plan National d'Adaptation au Changement Climatique*). The third PNACC is currently being drawn up and will cover the actions to be taken during the period from 2024 to

2029 to adapt metropolitan France and French overseas territories to the regional changes in climate expected between now and 2050.

## CSR

**Corporate Social Responsibility**, in other words, companies taking environmental, social, economic and ethical challenges into account in their activities.

## RTE

Manager of the French national power supply grid (*Réseau de Transport Electrique*).

## STEP

**Pumped storage power plant** (*Station de Transfert d'Energie par Pompage*): hydroelectric power facility consisting of two reservoirs at different altitudes, allowing electricity to be stored by pumping water from the lower reservoir to the upper reservoir, so the power can be redistributed during periods of peak demand.

## TCFD

**Task Force on Climate-Related Financial Disclosures:** G20 working group which issued the first recommendations on the transparency of corporate climate reporting published in 2017.

## TRACC

**Reference trajectory for climate change adaptation** (*Trajectoire de Référence pour l'Adaptation au Changement Climatique*). France set out a reference trajectory for climate change adaptation (TRACC) for itself for the first time in 2023. It corresponds to a warming of +4°C in metropolitan France in 2100 compared to the pre-industrial era (or of +3°C globally).

## UNFCCC

**United Nations Framework Convention on Climate Change** (*Convention-cadre des Nations unies sur les changements climatiques* - CCNUCC in French).



# NOTIONS NOT TO BE CONFUSED

## Weather / Climate

The weather refers to the prevailing meteorological conditions for today and the days to come. The climate is an average of meteorological conditions over a long period, of several decades or more. By way of convention, climate scientists use reference periods of 30 years.

## Mitigation / Adaptation

Mitigation addresses the causes of climate change, aiming in particular to reduce greenhouse gas emissions of human origin. Adaptation addresses the effects of climate change, aiming in particular to reduce the exposure and the vulnerability of people, infrastructures and ecosystems to the impacts of climate change.

## Physical risks / Transition risks

Physical risks are the risks of activities or infrastructures not being adapted to the physical effects of climate change, whether they be of a chronic or acute nature. Transition risks are risks posed to the company's business model due to the transition to a low-carbon economy, whether they be of a legal, regulatory, commercial, financial or reputational nature.

## Scenarios / Models

The IPCC's 6th report adopts five main scenarios to assess the global change in greenhouse gas emissions: SSP1-1.9, SSP1-2.6, SSP2-4.5, SSP3-7.0 and SSP5-8.5. The SSP (Shared Socio-Economic Pathways) number refers to a narrative describing socio-economic development (population, urbanisation, GDP) while the end figure refers to the level of radiative forcing resulting from greenhouse emissions: the higher this number is, the greater the greenhouse effect is. Climate models are complex computer programs which simulate the interactions between the atmosphere, the ocean, the Earth's surface, snow and ice, and various chemical and biological processes, to project climate change based on scenarios defined by the IPCC. There are currently over 100 models, used by 49 different climate science laboratories worldwide.

## Transmission / Distribution

The transmission networks are the "motorways of electricity": via high-voltage or extra high-voltage lines, they link centralised generation facilities to major agglomerations and major industrial sites. In France, RTE is responsible for the electricity transmission network. The distribution networks correspond to the "by-roads and side roads of electricity": via low- or medium-voltage, they link the transmission network to end consumers. Enedis distributes 95%

of electricity in France, with the other 5% being distributed by other companies or local utilities, such as Electricité de Strasbourg for example.

## Hurricanes / Cyclones / Typhoons

Hurricanes, cyclones and typhoons are related to the same meteorological phenomenon. Hurricane is a term of Native American origin, and refers to events in the North Atlantic and the North-East Pacific. Cyclones refer to events in the Indian Ocean (La Réunion) and the South Pacific (the Antilles). Typhoon is a term of Asian origin and is used to describe phenomena occurring in the North-West Pacific.

## Peak / Electricity consumption

The peak is the maximum power drawn onto the power grid during the year. This peak occurs in winter, during the week, in the morning or in the early evening. RTE's reference scenarios envisage a reduction in the peak (in GW) in France between now and 2050, due in particular to climate change, while projecting an increase in annual electricity consumption (in TWh).

## Heatwave / Drought

The term heatwave refers to an episode of high temperatures both at day and at night over period of at least 3 days. The thresholds of temperature and duration vary between the departments of France. Meteorological drought corresponds to a prolonged deficit in rainfall, potentially resulting in an agricultural drought (deficit in water in surface soils) and hydrological drought (abnormally low level of lakes, rivers and subterranean groundwater).

## Cooling water / Industrial water

Withdrawals of water are classified into three categories: A distinction is made between:

- water used in cooling circuits of the condenser, which either operates in an "open" circuit (the water withdrawn passes through the condenser heating up in the process and then returns directly to the aquatic environment) or in a "closed" circuit (the thermal energy is almost entirely transferred to the atmosphere via a cooling tower, with the addition of water withdrawn from a river; in this case, part of the water withdrawn evaporates);
- water used for industrial processes: production of demineralised water, washing and cleaning systems, fire protection system, etc.;
- drinking water.

# THE EDF GROUP'S 16 COMMITMENTS IN SUPPORT OF ITS RAISON D'ÊTRE

*Build a Net Zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development*





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