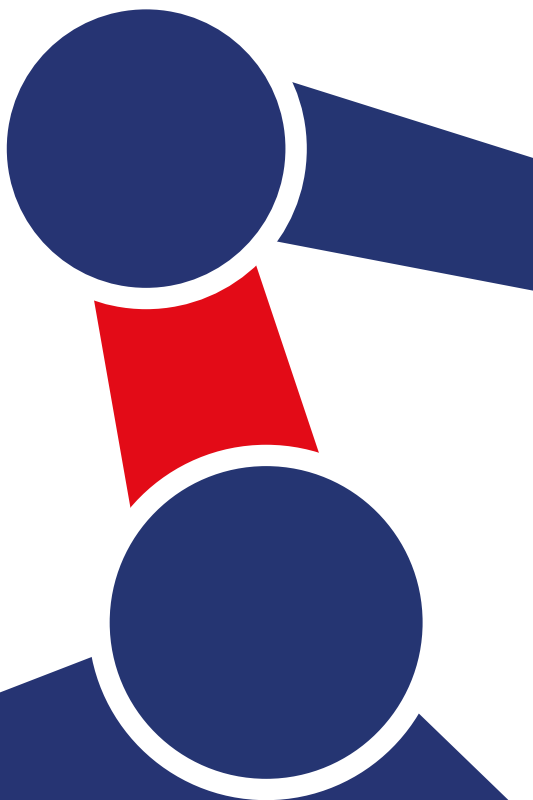


# **FRENCH NUCLEAR EXPERTISE**



# 1 A MAJOR INDUSTRY

With 220,000 professionals, spread across more than 3,000 companies (operators, large corporates, SMEs, mid-size companies, startups), nuclear power is France's third largest industrial sector after the aerospace and the automotive sectors. (SFEN, 2021)

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# 2 #1 SOURCE OF ELECTRICITY

With 56 nuclear reactors at 18 sites, with a capacity of 61.4 GWe, nuclear power accounts for 67.1% of all energy generated in France in 2020, ahead of hydraulic power (12.1%), 7% for thermal production (gas, fuel oil, coal), 7.3% for wind power, 2.2% for solar and 1.8% for bioenergy. (French grid operator RTE, 2020)

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# 3 LOW-CARBON ENERGY

Thanks to nuclear energy and renewable energies, 92% of the electricity produced in France is low carbon (RTE, 2019). In 2019, France emitted only 6.8 tonnes of carbon dioxide equivalent per capita, compared with 7.3 for the United Kingdom, 10.1 for Germany and 8.4 tonnes on average in the EU-27 (Eurostat). These performances have ranked France ninth in the world in terms of energy transition according to the World Economic Forum. (WEF, 2021)

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# 4 HIGHLY SKILLED JOBS

Two-thirds of the nuclear sector workforce are executives or 'ETAMs' (employees, technicians and supervisors), with twice as many highly skilled jobs as the French industrial average. There are nearly 70 specialist nuclear training courses in France. (SFEN, 2019)

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# 5 AN EXPORT SECTOR

In 2020, France was the leading European exporter of electricity by volume (77.8 TWh), ahead of Germany, with a surplus balance of 43.2 TWh (RTE, 2019). In 2019, France's electricity exports represented 15% of its production, or €2.7 billion (CRE, 2019). Overall, the French nuclear industry exports €6 billion of electricity and goods and services each year. (SFEN, 2020).

# 6

## INTERNATIONALLY RECOGNIZED EXPERTISE

France has a strong international commitment, where 120 reactors are of French technology and 250 reactors are the subject of services provided by key players in the sector (National Council of Industry, 2018). The commissioning or construction of third generation EPR reactors which have a capacity of 1,600 MW, continues this tradition of excellence.

# 7

## CONTROLLED WASTE MANAGEMENT

Ninety-six percent of materials from spent nuclear fuels are recycled and then used to produce new fuels (including MOX). The volume of long-lived ultimate waste (known as HAVL) is thus divided by five. These techniques make it possible to produce 10% of French electricity from recycled fuel. (SFEN, 2019)

# 8

## DECOMMISSIONING EXPERTS

Heir to a long tradition in the decommissioning of nuclear installations (La Hague, Chooz, etc.), the French nuclear sector is going global. In 2017, Orano, in partnership with American firm NorthStar, took over the remediation and decommissioning program for the Vermont Yankee site in the United States, and in 2019 it took over the sites of German nuclear operating company RWE, in partnership with EWN. What's more, the EDF group signed a contract for three power plants in Italy, and it was chosen by the agency ENRESA for the deconstruction of sites in Spain, with its partner WES.

# 9

## DEVELOPING THE REACTORS OF THE FUTURE

Research is focused on fourth generation reactors, which are efficient, safer and generate less waste, as well as on modular and compact reactors (SMR), which are smaller and more flexible. In nuclear fusion, the ITER project, which involves 35 countries, is under development at Cadarache (PACA). The Jules Horowitz (RJH) research reactor is being built on the same site, as part of an international consortium.

# 10

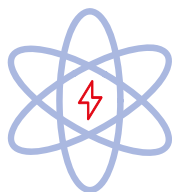
## A STRONG ECOSYSTEM

In addition to the World Nuclear Exhibition, the world's leading trade fair, organized in France, French nuclear key players can rely on a strong ecosystem. Created in 2018, GIFEN brings together the main players in the industry. The CEA develops and supports research on nuclear energy. ANDRA is in charge of the management of radioactive waste produced in France. The CIGEO ultimate landfill project, which ANDRA is leading, is one of the major industrial investments of the decade in France. What's more, ASN carries out nuclear safety control missions, while IRSN conducts research and expertise on the risks associated with radioactivity.



**#1**  
HOST COUNTRY IN  
EUROPE FOR INDUSTRIAL  
INVESTMENTS

(EY)



**#1 SOURCE OF  
ELECTRICITY  
FRANCE (67% OF  
TOTAL ENERGY  
PRODUCTION  
IN FRANCE IN 2020)**

(RTE)



**92% OF ELECTRICITY  
PRODUCED IN FRANCE  
IS LOW CARBON**

(RTE)



**ACCESS TO A MARKET  
OF 67 MILLION  
CONSUMERS AND  
PLATFORM FOR THE  
MIDDLE EAST/AFRICA  
ZONE**

(INSEE)

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