



# Energising Europe: EDF's Nuclear Portfolio and Industrial Solutions

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Olivier GODON

*Head of Business Development for the Netherlands and Nordics Countries*

*EDF International Nuclear Development*

### Previous positions

New build strategy senior manager (EDF)

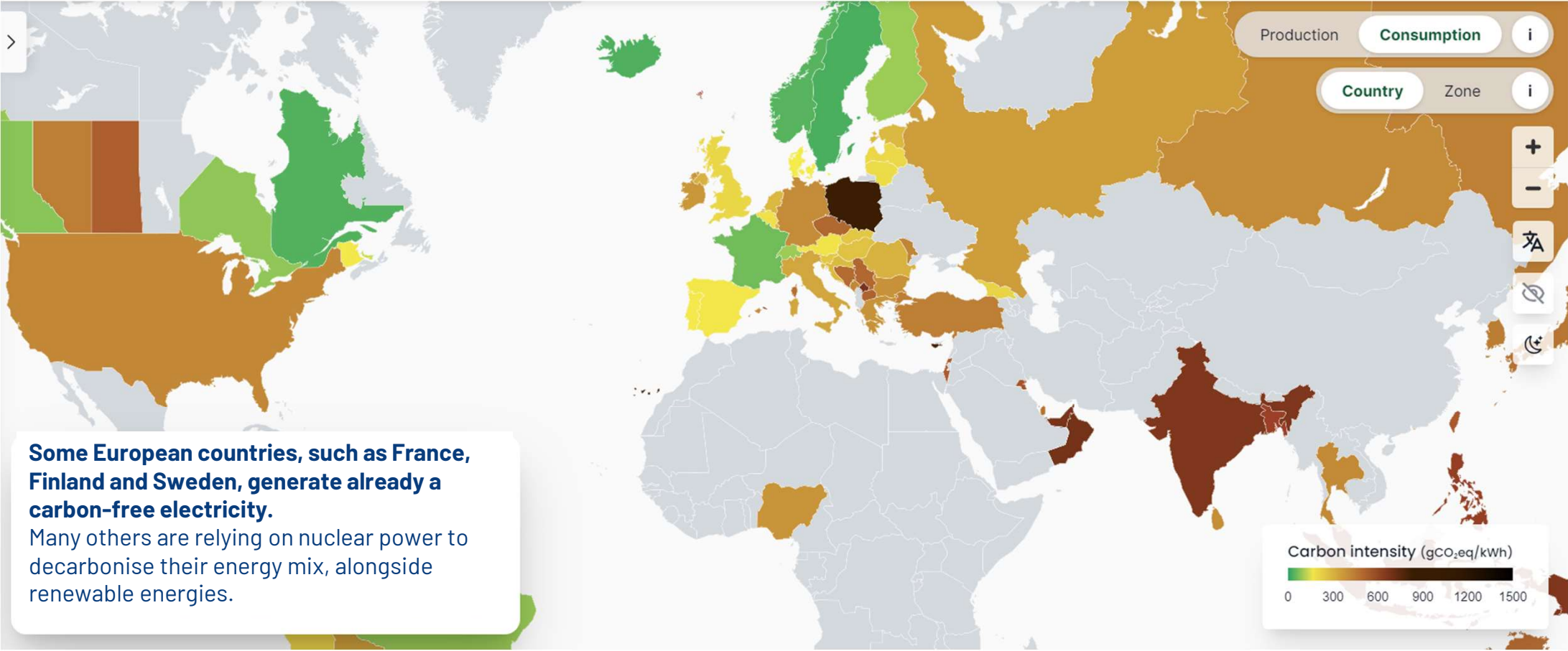
Head of Marketing for nuclear new build projects (AREVA)

Senior internal auditor (AREVA)

Project manager, nuclear core design department (FRAMATOME)

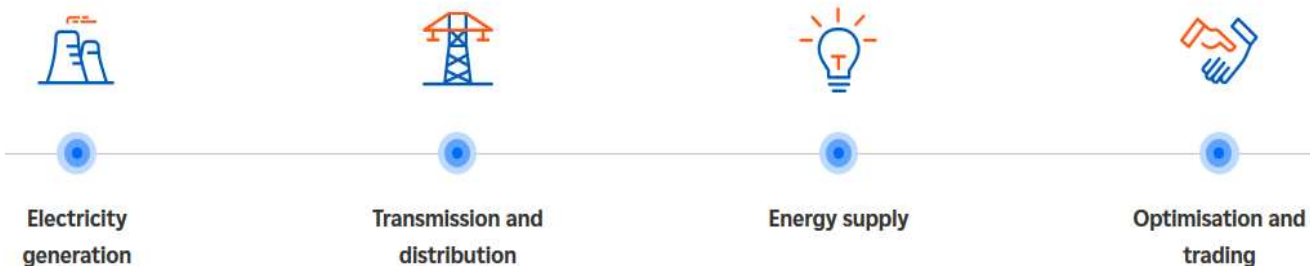


# A SNAPSHOT OF GLOBAL ELECTRICITY PRODUCTION: DIFFERENT ELECTRICITY MIXES LEADING TO DIFFERENT RESULTS IN TERMS OF DECARBONISATION

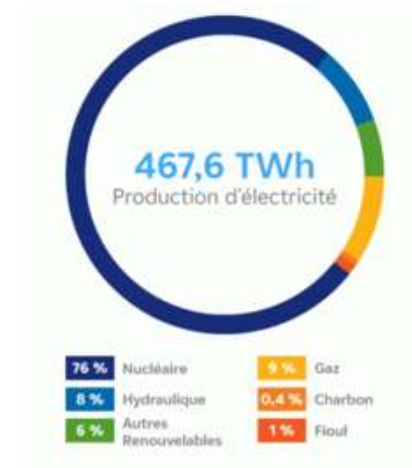


## EDF ACTIVITIES COVER ALL ELECTRICITY-RELATED ACTIVITIES, IN EUROPE AND WORLDWIDE

- The largest distribution grid in Europe and the main distribution grid in France: **connected to 95% of the French metropolitan population**
- Producing **96% of CO<sub>2</sub>-free<sup>(1)</sup> electricity in France**
- Owning **the largest nuclear fleet worldwide**: 56 operating reactors in France

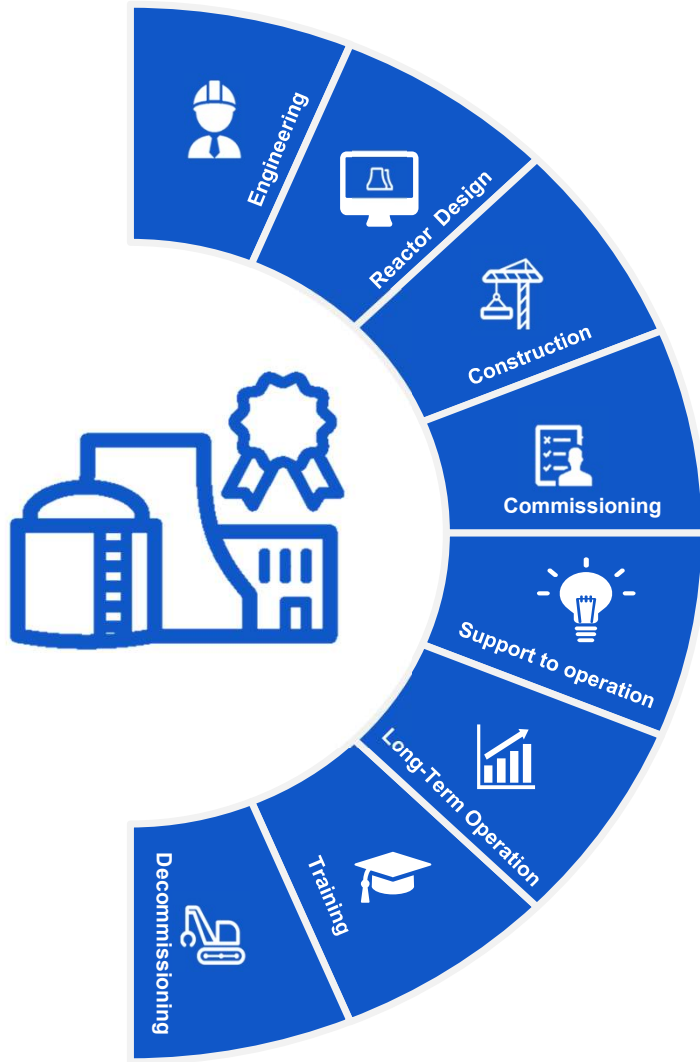


## EDF Electricity Output in 2023



**60 GW net renewables target for 2030 thanks to a strong acceleration of offshore wind, onshore wind and solar**

# EDF AND THE FRENCH NUCLEAR INDUSTRY: A UNIQUE EXPERIENCE BENEFITTING TO NUCLEAR PROJECTS



**56** reactors  
in operation

**61,4 GWe**

**1 EPR** under commissioning  
(2024) / fuel loading completed



**9** reactors  
in operation

**5,9 GWe**

**2 EPR** reactors in  
construction (HPC)



**2 EPR** in operation\*

\* EDF minority shareholder



- **65 reactors\*** operated by EDF (alone) in Europe
- Nuclear is the **third industrial sector** in France
- **+220,000 jobs** in France
- **+3,000 SMEs** involved

\* The EPRs reactors in Taishan (China) are operated by operated by TNPJVC, a joint venture established between CGN (51%), EDF (30%) and the provincial Chinese electricity company Yuedian (19%).

## DELIVERING IN EUROPE: EDF NEW BUILD AND OPERATING EXPERIENCE

OL3 in production



HPC achieving key milestones

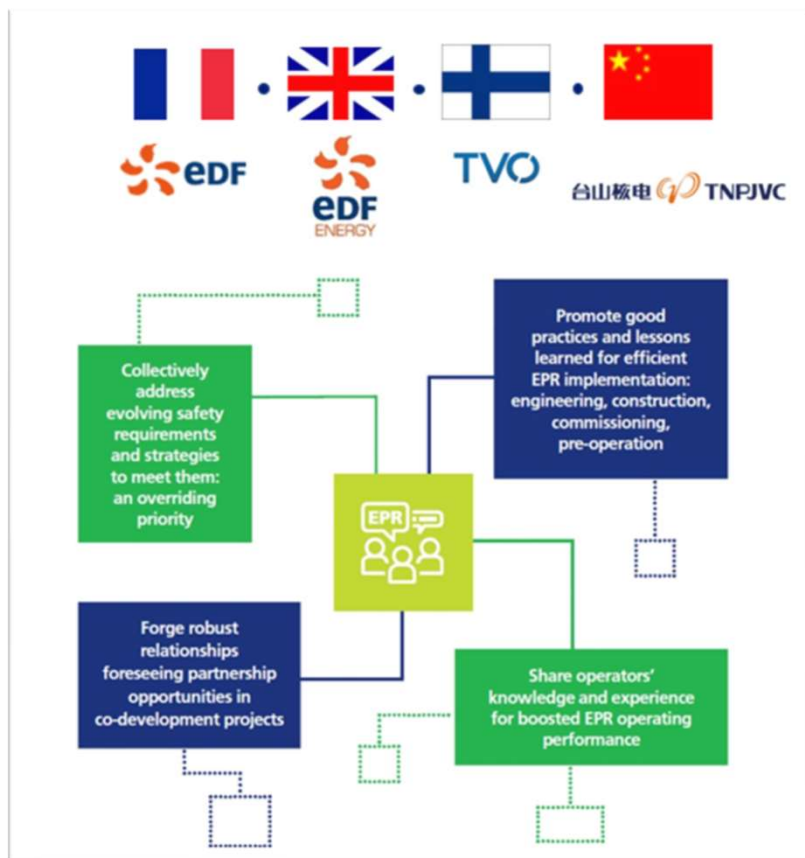


FLA 3 approaching divergence





## BEYOND CONSTRUCTION AND COMMISSIONING, A LONG-TERM PARTNERSHIP



Any EPR project can join EPROOG as soon as the Final Investment Decision is taken.

### Owner-operators of EPRs benefit from a support network

Choosing EPR is sharing more than a technology. It allows to join the EPROOG organisation which is a **structured & mutual body** between Owners and Operators of EPRs to support their projects and achieve the best performance of EPR units from Construction to Operation. **Working groups by theme and steering committees** are meeting several times a year.

#### > EPR Owners & Operators Group

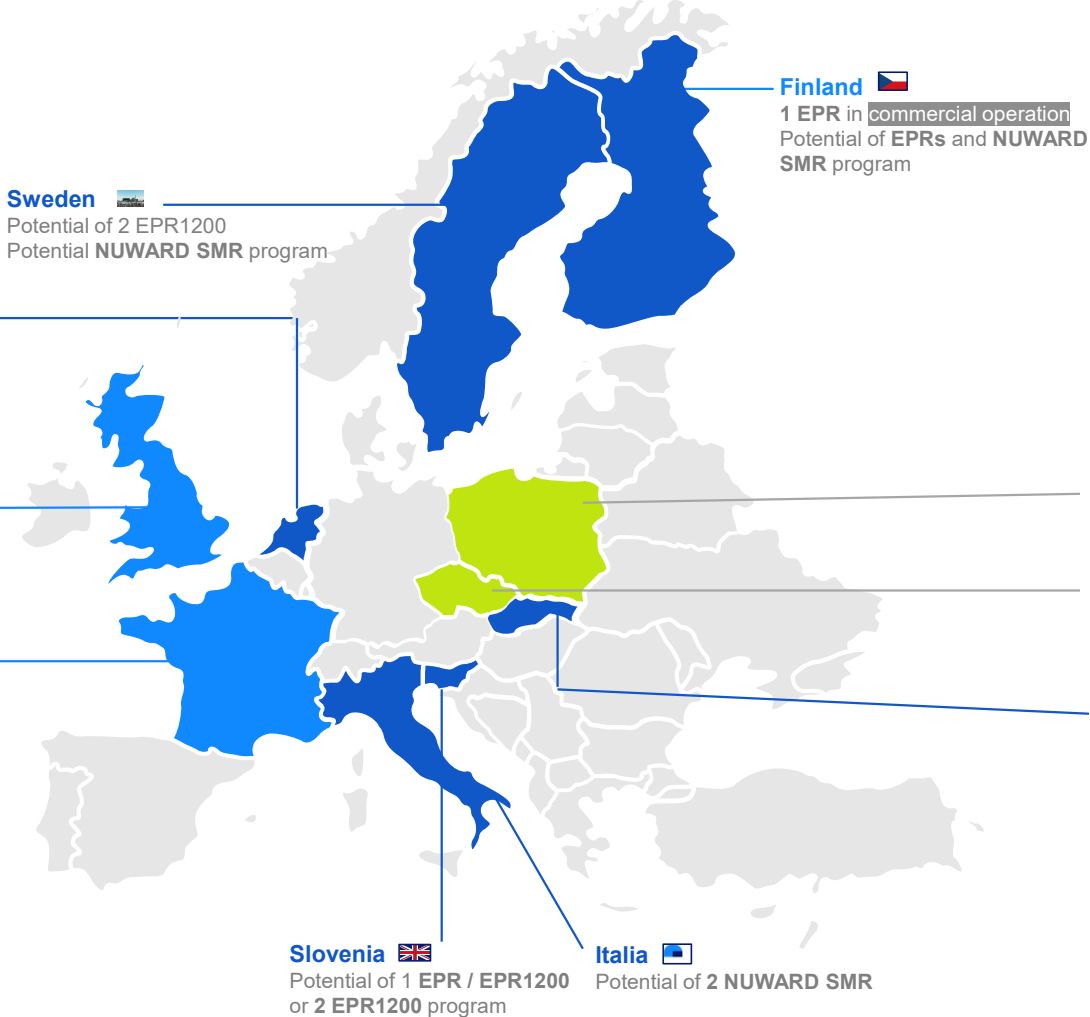
- A collaborative network created in 2015
- Current members : TNPJVC (Taishan), TVO (OL3), EDF Energy (HPC & SZC) and EDF (FLA3)
- A community of EPR to share construction and operation experience, to support each other

#### > Two areas of collaboration supported by a shared strategic vision

- Construction projects from Final Investment Day to Commercial Operation Date
- Operational experience as soon as the future operator arrives on site

# TANGIBLE PERSPECTIVES FOR EPR TECHNOLOGY (POTENTIAL FLEET OF +30 EPR / 12 EPR CONFIRMED) AND NUWARD SMR PROJECTS

- EPR projects in operation and program under development
- Prospects with bid submission
- Structured discussions about potential projects



Joining the European **EPR & NUWARD SMR fleet** guarantees continuous long-term synergies in sharing **lessons learned** and providing **logistical support and services**.  
 An opportunity to create a **common industrial platform**, allowing Europeans to work together on all projects on the horizon of 2035 and beyond.



# KEY ENABLERS TO MEET THE EUROPEAN MARKET EXPECTATIONS

## Products

A portfolio of reactors developed for the **European Market** integrating our operator's experience



Value Proposition



## Partnership

EDF, its supply chain and the French Government, are committed to enter into a long term **partnership for the entire of nuclear power plants**

## Projects

A tangible pipeline of projects in Europe, including **6 in France**

## Delivery

Unique and **exclusive experience** in delivering recent new build projects in EU



# EDF ENGINEERING AND INDUSTRIAL CAPABILITIES SUPPORTED BY A EUROPEAN SUPPLY CHAIN



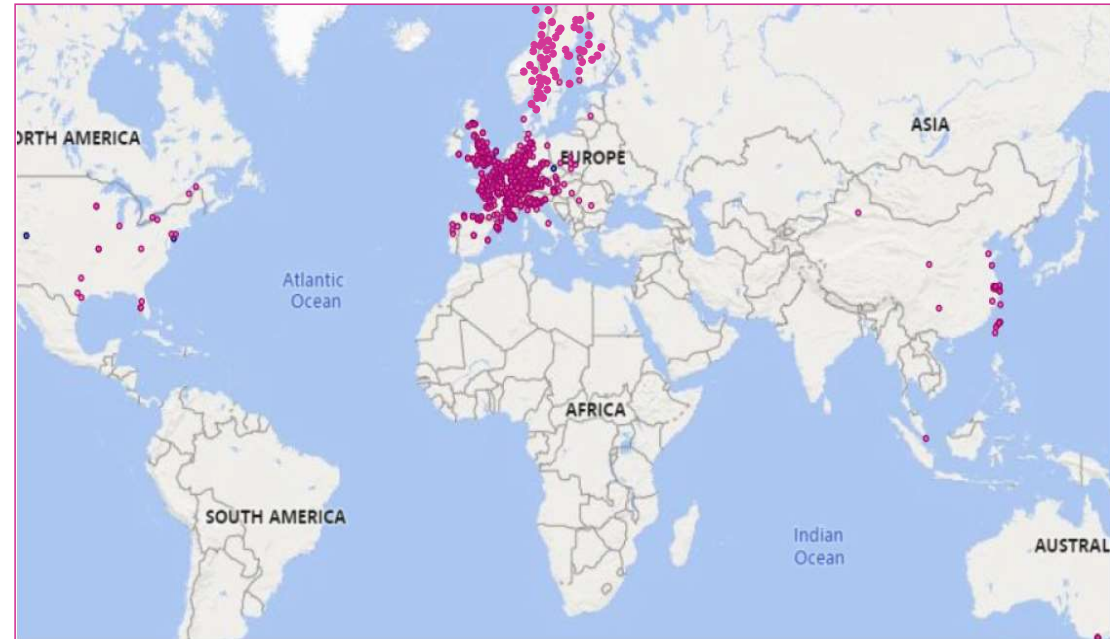
**+ 50,000** EDF Group staff working in nuclear

Including **7,000** employees working in engineering

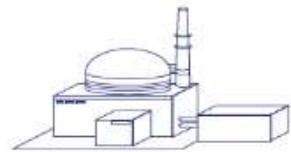


**+60** sites worldwide, including key manufacturing factories in Le Creusot and Saint-Marcel (France)

With **95%** of its supply chain already in Europe, the EPR and NUWARD SMR are technologies capable of bringing to the European supply chain the activity needed to develop and maintain its capability, sovereignty and value creation.

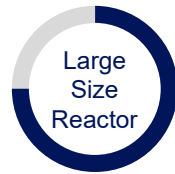


## A PORTFOLIO OF REACTORS TO MEET CUSTOMERS EXPECTATIONS

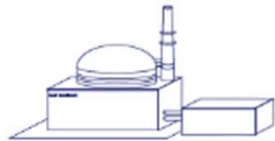


**EPR**

1,650 MWe



- Most powerful reactor in the world
- The leading reference for very high energy demand
- High maneuverability



**EPR1200**

1,200 MWe



- EPR adaptation to 1200 MWe
- Adapted to various site and grid conditions
- High maneuverability



**nuward SMR**

340 MWe



- Adaptable to various environments
- Other low-carbon use: hydrogen, heat & electricity cogeneration, district heating, water desalinization
- High maneuverability



leveraging decades of EDF's experience in designing, building, and operating PWR, and proving efficiency in meeting market needs.







## NUWARD SMR: SAFE, SIMPLE, COMPETITIVE

 **340 MWe**  
from 2 integrated independent  
reactors of 170 Mwe each

 **>90% availability**  
**60 years of operation load-following**  
**capability**

 **Safety objectives that meet the best**  
**international standards**



 **Modular approach**  
**40-month construction duration**

 **Improved landscape integration**

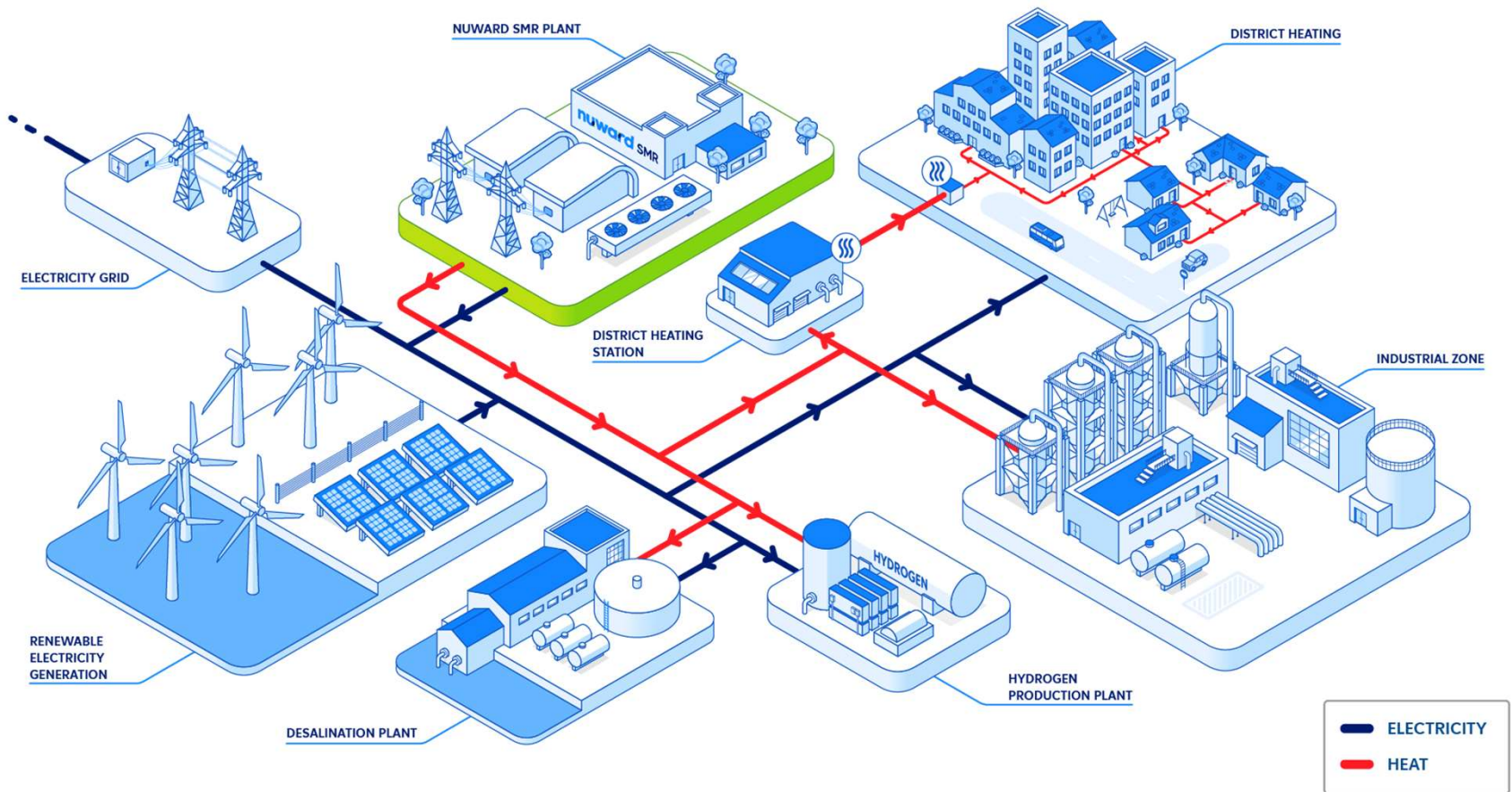
 **Multipurpose by design**  
**H<sub>2</sub>, district heating, industrial heat, CO<sub>2</sub>**  
**capture**

 **First Nuclear Concrete in France**  
**Commercial operating date by 2035**





# NUWARD SMR: MULTIPURPOSE BY DESIGN



# MARKET & PRODUCT APPRAISAL : INAB

## International NUWARD Advisory Board



By providing valuable insights from across the world, the INAB is fine-tuning NUWARD SMR's product development **to align precisely with market demands.**

This ensures that **NUWARD SMR is a solution tailored to the real-world energy needs,** leading the way in next-generation nuclear technology.







# NUWARD SMR: PIONEER IN EUROPEAN LICENSING AND HARMONISATION

A unique initiative with the Joint Early Review Process

Phase 1 completed with three European nuclear safety authorities

- New kind of discussion between Nuclear Regulators with a technology developer
- First early feedback benefiting Basic Design studies
- Providing invaluable insights on international licensing

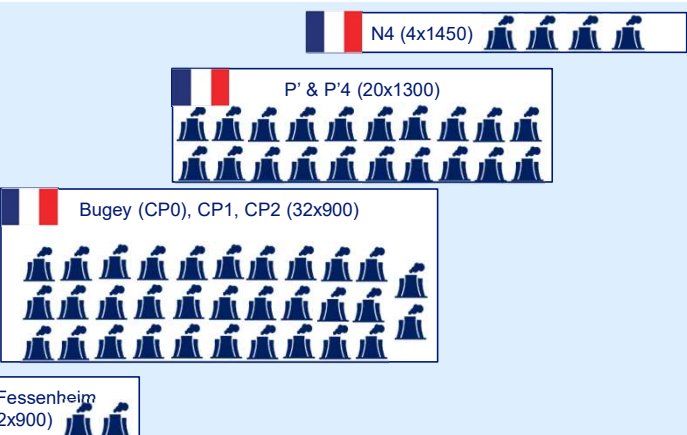
Phase 2 launched in December 2023 with three additional European nuclear safety authorities



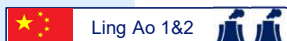
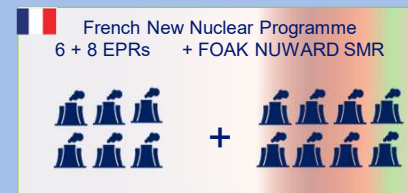
# WE (AS EUROPEAN NUCLEAR INDUSTRY) DID IT YESTERDAY, WE WILL DO IT TOMORROW

FRANCE

EXPORT



The current pipe of EDF projects (France + Export) offers a perspective of an average launch of 2 EPRs per year



GEN III+ (EPR)

## Phase 1: 66 reactors constructed in less than 30 years

Construction of a significant number of reactors, **in France and abroad**, in less than 30 years, demonstrating the benefit of **fleet construction** in terms of competitiveness and industry readiness.

## Phase 2: 5 reactors constructed in 20 years

With the delivery of energy through its extensive nuclear programme, France has reached a phase of stability, triggering a **slowdown in new nuclear projects** but also a progressive loss of capacity and industry readiness.

## Phase 3: 20+ reactors to be constructed

France is reigniting its nuclear ambition, both **domestically and internationally**. Leveraging lessons from past projects and the advancements in EPR technology, EDF is embarking on a new wave of nuclear projects, benefitting from the fleet effect.





- **Contact:**
- **[nucleardevelopment@edf.fr](mailto:nucleardevelopment@edf.fr)**

• **Thank you**