Offshore Wind in France
& Cooperation with Japan

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Offshore Wind in France

Energy & Climate targets in France

- **Greenhouse gases reduction targets**

  → 40% reduction between 1990 and 2030

  → **Carbon neutrality** by 2050

- **Targets for renewable energy development**

  → **32% renewable share in total energy mix** by 2030

  → **40% renewable share in total electricity mix by** 2030 (currently around 20%)

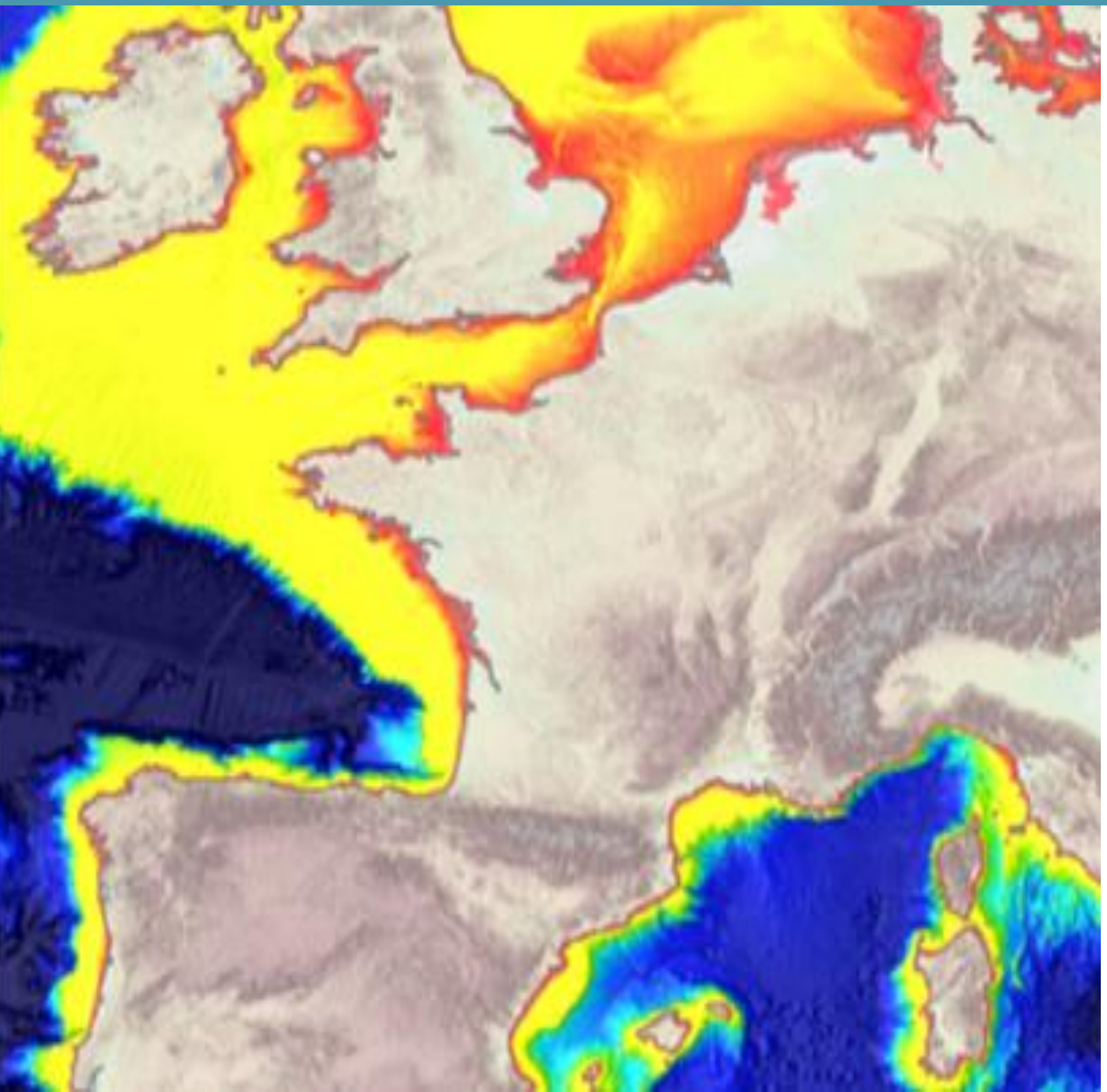
- **Targets for wind energy**

  → **Onshore:** 22 to 26 GW in operation by 2023

  → **Offshore**: **5 GW in operation by 2028**

Icons: Energy collection by Becris from the Noun Project

Assets of France for offshore wind



- ✓ **The second potential in Europe**, thanks to more than 3500km of coastlines, and to an EEZ of more than 11Mkm²
- ✓ **Industrial know-how,** all along the value chain, with leaders in energy, oil&gas, etc.
- ✓ **Harbours infrastructures**
- ✓ **Territories involvement,** with the creation of several clusters in littoral regions
- ✓ A well-developed **power grid**
- ✓ **A high level R&D base:** universities, laboratories, test sites, etc.

Public policies for offshore wind

I. Calls for tender

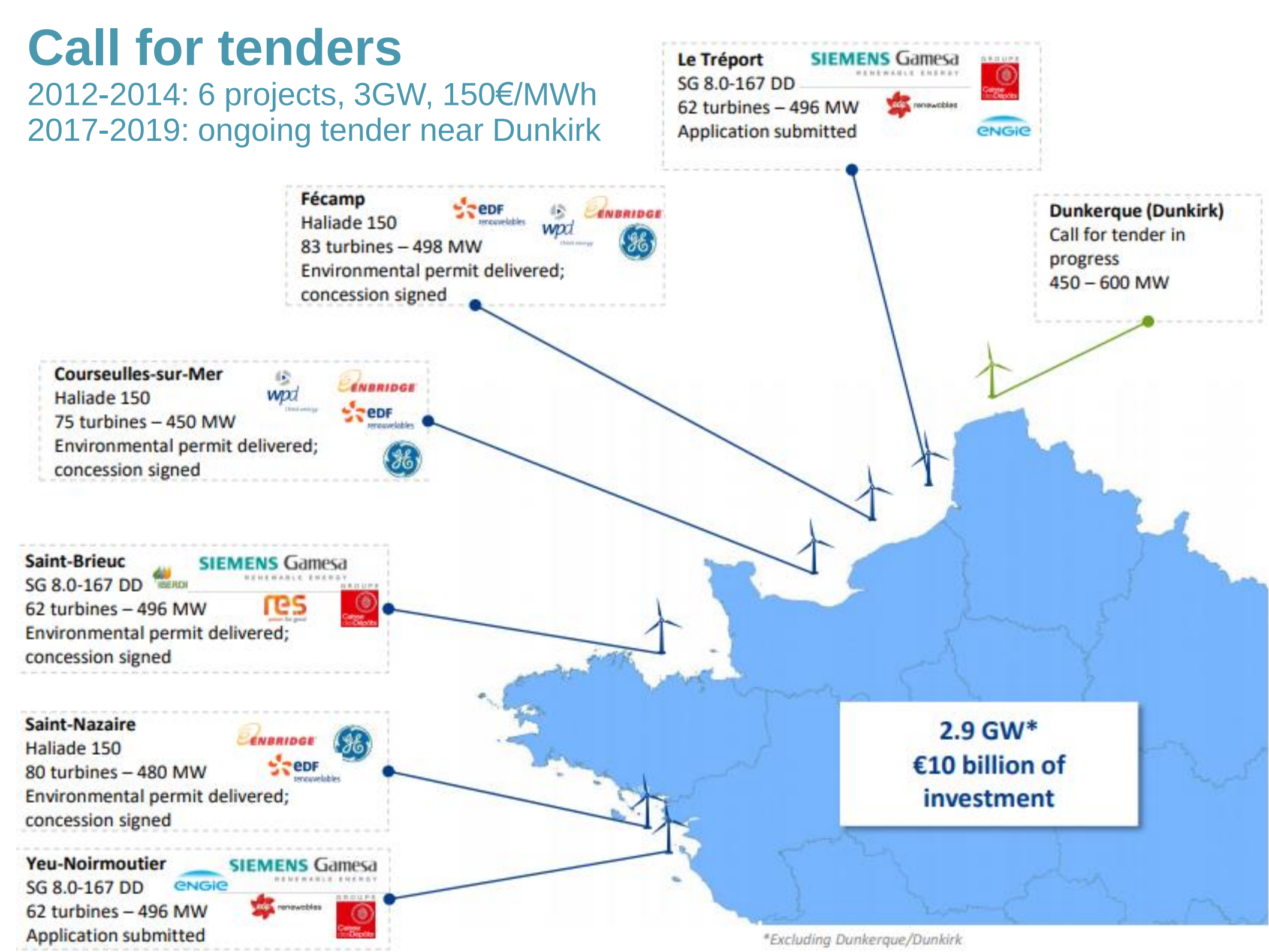
- From 2016: Competitive dialogue
- 2018/2019: New set of rules to reduce procedure duration and allow more flexibility
- Roadmap for new capacities every year until 2028

II. Support for innovation

- Financing for R&D projects
- Accompanying projects to commercial deployment

Call for tenders

2012-2014: 6 projects, 3GW, 150€/MWh
2017-2019: ongoing tender near Dunkirk



*Excluding Dunkerque/Dunkirk

Innovation: floating offshore pilots

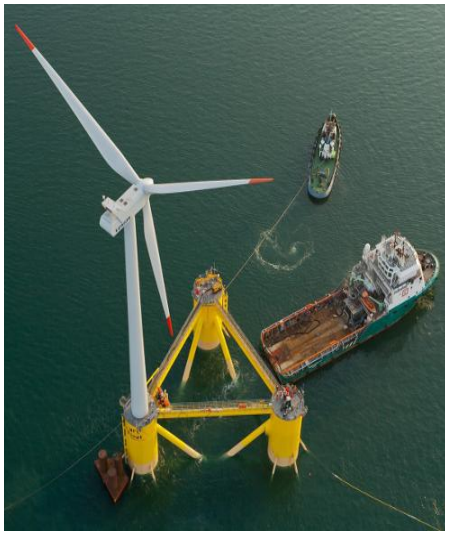
1 demonstrator in operation since 2018

FLOATGEN, a floating wind turbine demonstrator
Objective: to validate the performance of the combination of a wind turbine and a floating foundation
Capacity: 2 MW (Vestas V-80)
Installation location: Le Croisic
Water depth: 33 m
Consortium:

FLOATGEN

Fraunhofer IWES · zabala innovation consulting · RSK · Universität Stuttgart · CENTRALE NANTES · ideol · Bouygues Travaux Publics

4 pilot farms scheduled for 2021



Farm	Characteristics	Industrial partners
Faraman	3 turbines – 24 MW	EDF renouvelables · SBM OFFSHORE · SIEMENS Gamesa RENEWABLE ENERGY
Groix-Belle Île	4 turbines – 24 MW	EOLFI · CGN · NAVAL ENERGIES · VINCI · GE · Groupe Caisse des Dépôts
Gruissan	4 turbines – 24 MW	Quadran ENERGIES MARINES · ideol · Bouygues Travaux Publics · SENVION
Leucate-Barcarès	4 turbines – 24 MW	ENGIE · EDP renewables · Groupe Caisse des Dépôts · EIFFAGE · GE

Cooperation with Japan

French-Japanese cooperation for energy transition

- **Between ministries/agencies:**
  - **Energy transition policies dialogue** between French and Japanese ministries of energy
  - **Industrial cooperation for new energy systems** between French and Japanese ministries of industry
  - **Dialogue on energy and environment R&D policies** between public agencies
  - Since 2019 : **Maritime Dialogue** (all ministries), including marine and offshore renewable energy

- **Private sector:**
  - French companies involved in **energy transition projects in Japan**, including hydrogen, smart-grids, energy efficiency, renewables
  - French-Japanese energy projects in **third countries**, including Africa and South-East Asia

French companies initiatives for **renewables in Japan**

- Since **2009**
- From **Hokkaido** to **Okinawa**
- **Solar**, **fuelwood, biogas**, **wind**
- In **partnership** with Japanese companies

Photos : Ciel&Terre, Ideol, Colas, Veolia

French companies working on offshore wind with Japanese partners

ideol

- Only non-Japanese technology identified by the Japanese government as a solution to reduce cost of floating offshore
- Present in Japan since 2015, opened a subsidiary in 2019
- Currently developing projects in Japan with leading engineering and construction companies

NAVAL ENERGIES

- Floater customized to answer project and client specs. Can be made of steel, concrete or hybrid
- Ability to adapt to each project specificities in Japan

BOUYGUES

- Present in Japan for construction and energy, already several references in solar PV
- Involved in floating offshore projects in France, interested in discussions with Japanese partners

ENGIE

- Opened its office in Japan in 2017
- Member of Japan Wind Power Association (JWPA)
- Interested in future development of offshore wind in Japan, with local and global partners

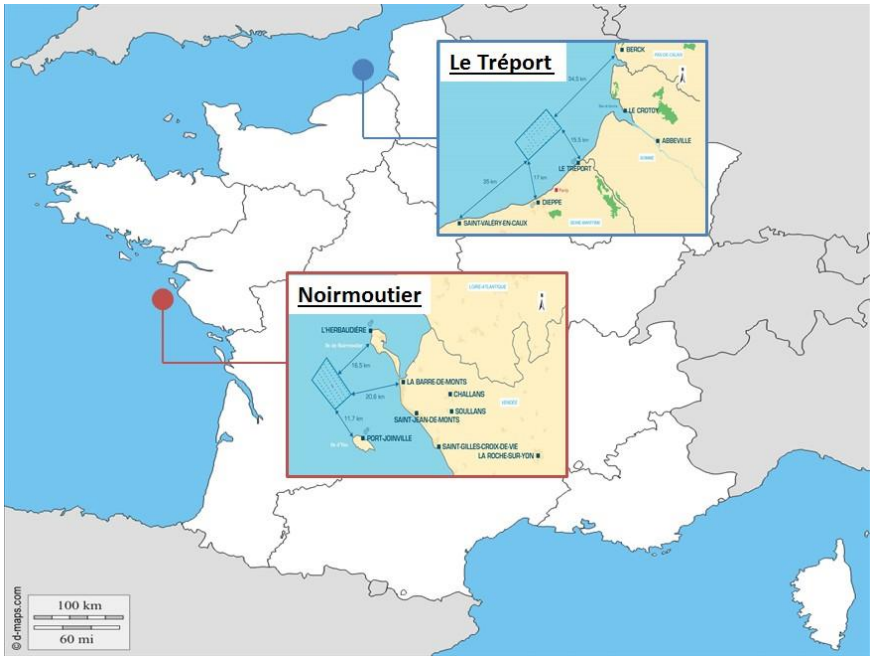
The Hibiki-Nada floating wind turbine

- **Ideol** has designed and engineered for **Hitachi Zosen** the floating wind foundation (and its mooring system)
- **3 MW**, 2-blade turbine, installed offshore (Kyushu) in September 2018
- Steel hull (45m x 45m x 7.5m draft)
- Financed by **NEDO**
- Typhoon-prone location

Sumitomo + ENGIE + EDP Renewables
Agreement for two offshore wind farms in France

In December 2018, Sumitomo has acquired 29.5% of the shares of “Le Tréport” and “Noirmoutier” offshore wind projects

- Both projects are under development by ENGIE and EDP Renewables (part of the 6 tenders from 2012-2014)
- Total cost: 4 billion euros
- Total capacity: 992 MW
- Will supply enough electricity to meet the consumption needs of 1,640,000 people



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