EU Funding Options for Clean Energy Technology Demonstration

Wind Meets Gas

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EIC Fund – TF3 Financial Instruments
DG Research & Innovation, European Commission

First-of-a-kind demonstration projects

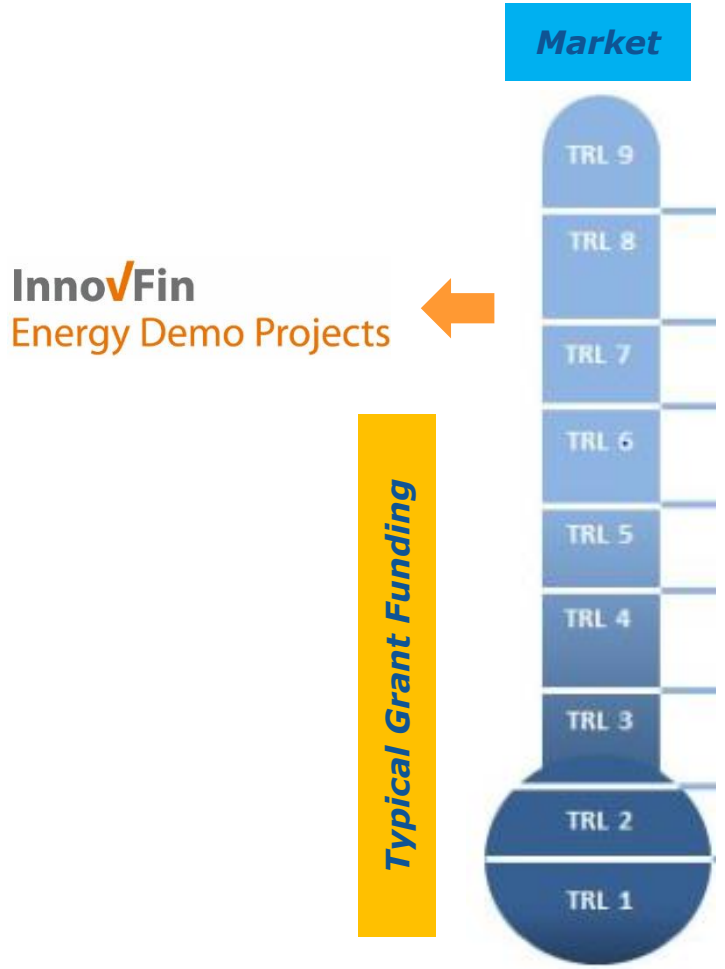
TRL: Technological Readiness Level

- **Crucial to keep / regain EU's technological leadership in clean energy**

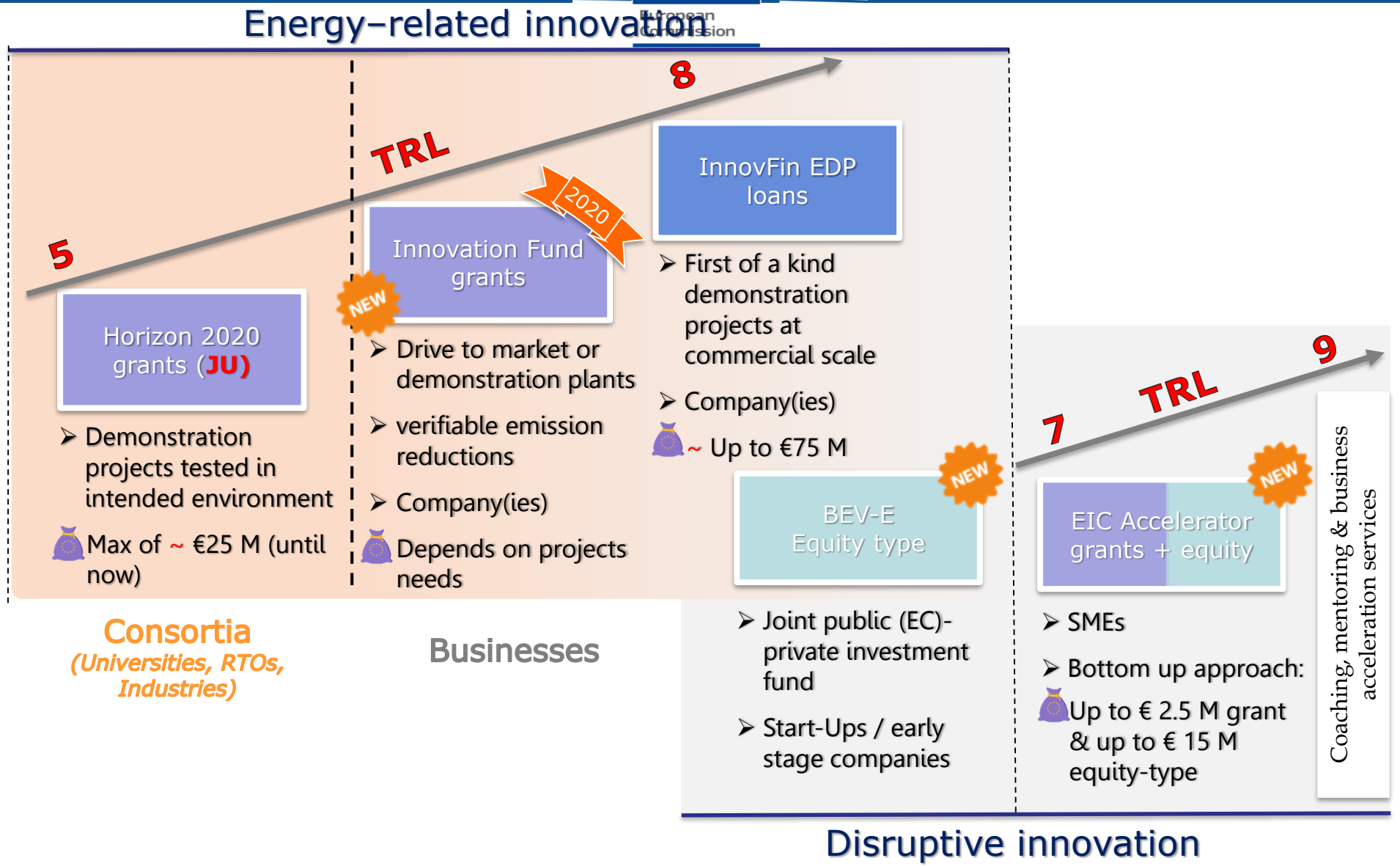
But…

- **Market failure in accessing risk-finance ("valley of death")**
- **Large investment needs**

  In 2016: up to €28 billion by 2020 in SET Plan areas (not counting with nuclear energy and energy efficiency)



EU funding options in current MFF (until 2020)



EU R&I Investment Strategy

Intervention logic

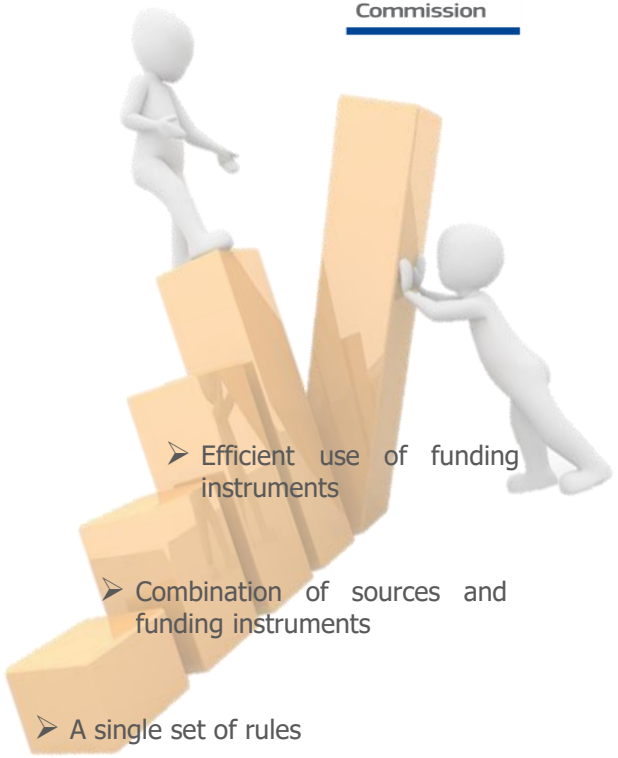
European Commission

Horizon Europe

Pillar 1
Infrastructure

Pillar 2
6 Clusters

Pillar 3
EIC (Pathfinder) – EIT (excluded equity InnoEnergy)



- Efficient use of funding instruments
- Combination of sources and funding instruments
- A single set of rules

InvestEU

- Research, Innovation & Digitisation Window
- SME Window
- Sustainability proofing
- Financial & Advisory
- State Aid
- Loans
- Equity investments
- Guarantees

No public intervention

Grants | **Blending*** (NEW) | **Financial Instruments** | **Market**

*In addition of the current EIC Accelerator

InnoVFin
Energy Demo Projects

European Commission

Basic features

Scope

Renewable energy
Smart energy system
Energy storage
Carbone Capture Utilisation & Use

Incl. manufacturing plants and services for these technologies

- **Implemented by the EIB**
- **EC involved in eligibility check (criteria I) and budget**

Budget

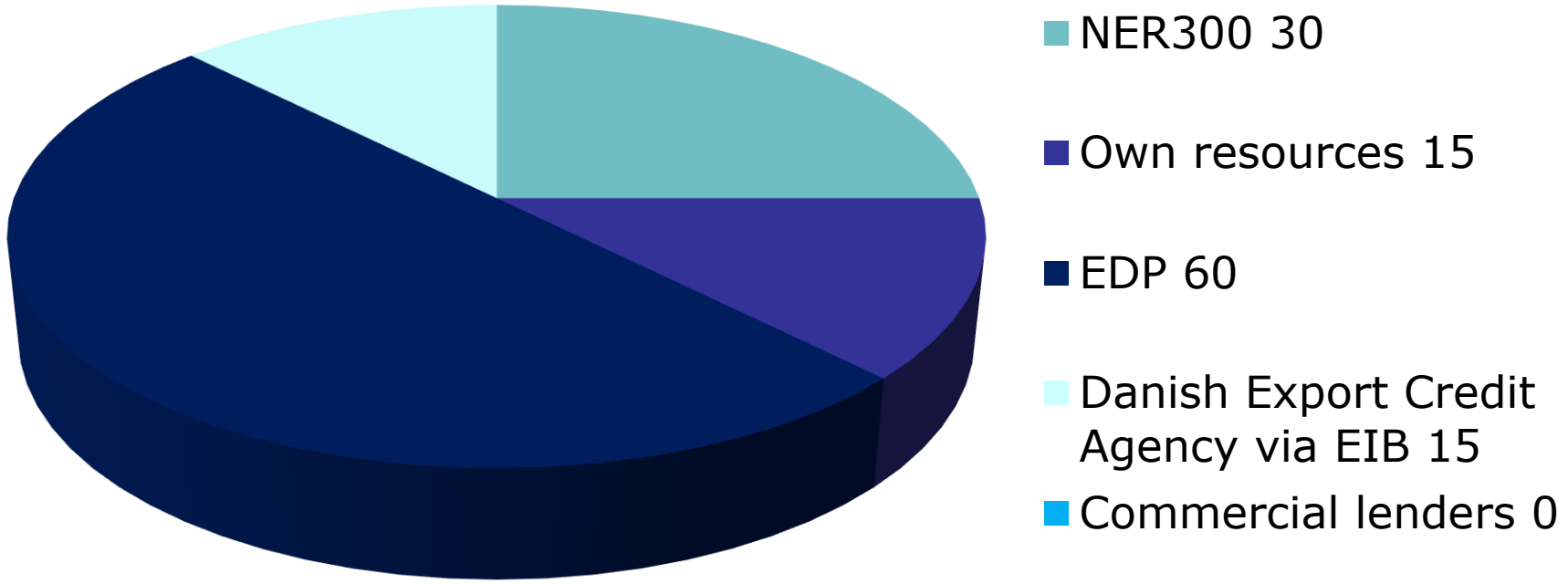
Up to € 800 million

European Investment Bank The EU bank

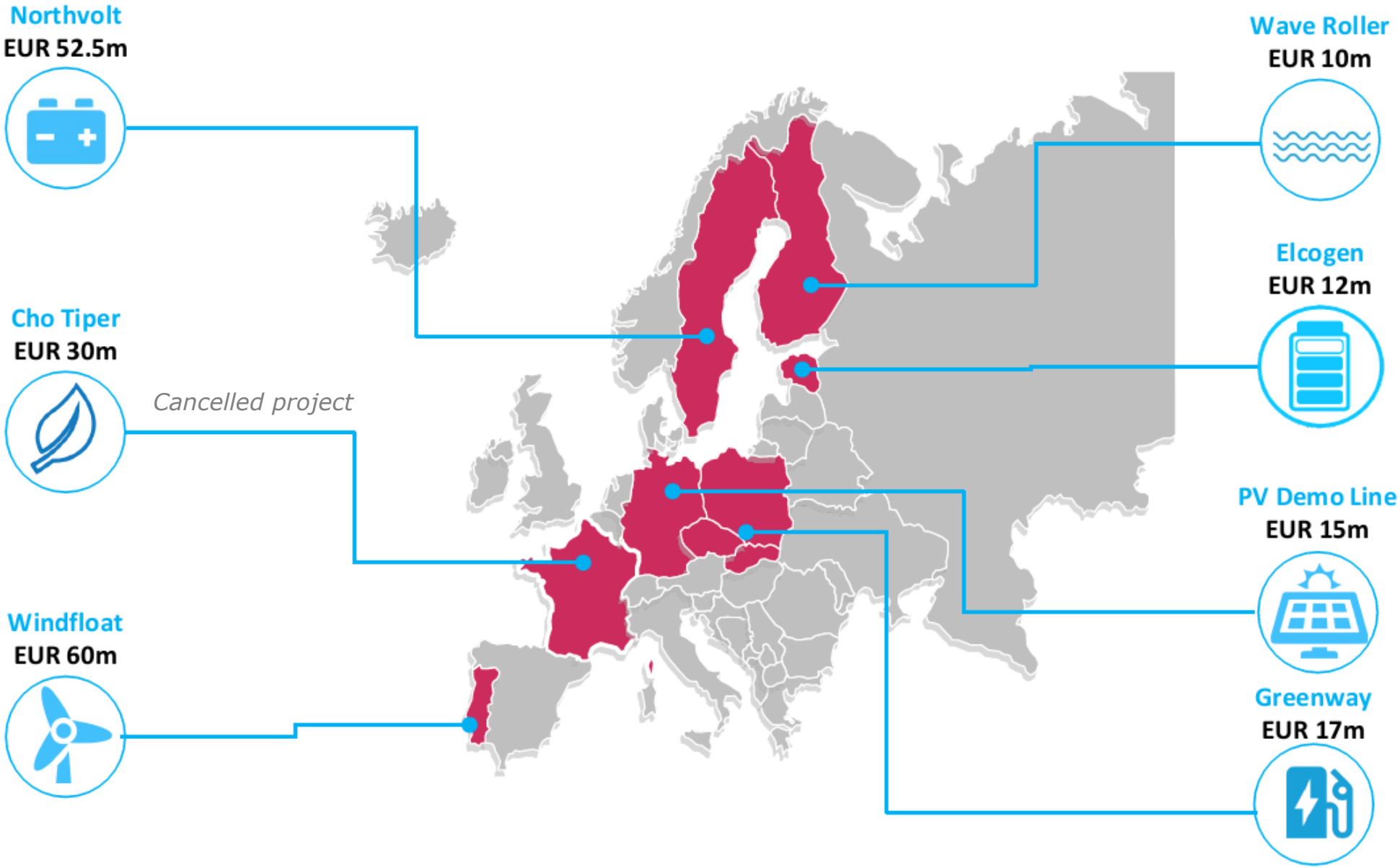
EUROPEAN INVESTMENT FUND

Example of FOAK commercial-scale demo

Example of financial engineering of FOAK



Current InnovFin EDP portfolio and respective EU support



European Commission

Wave Energy Device: the first project signed

Project characteristics

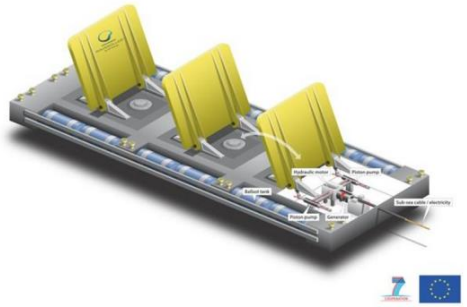
- **First-of-a-kind 350 kW wave energy demonstration unit**
- **Finnish company AW-Energy**
- **Installation near Peniche (Portugal)**

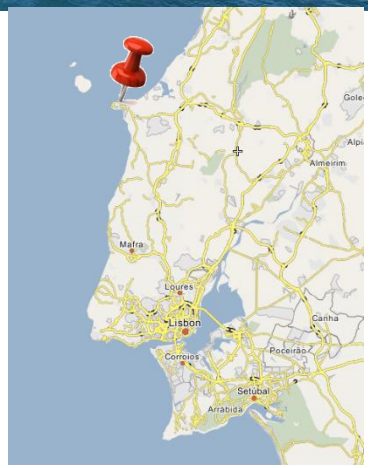
Technological development

- **2003 – concept and first tests**
- **2007/2008 – prototypes**
- **2009-2013 – FP7 project "SURGE"**
- **2012 – Pilots deployed**

Finance

- **Support: €10 million InnovFin EDP loan**
- **Project cost: €19 million**





Oxford PV

Innovative pilot manufacturing of photovoltaics in Germany

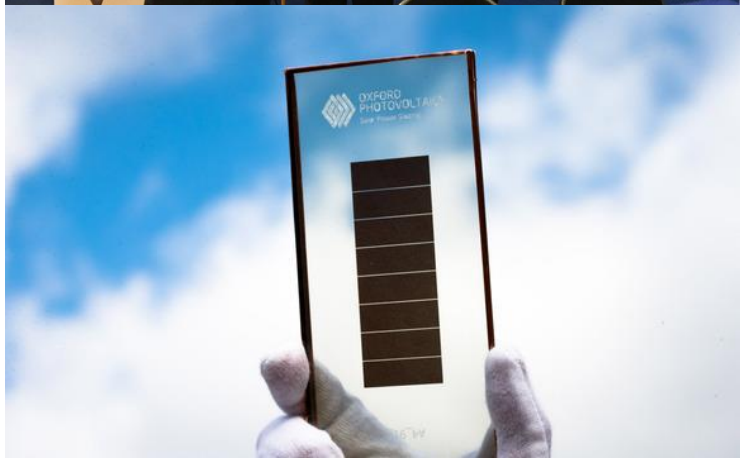
- **Production of crystaline silicon/perovskite solar cells which can lead to a leap in PV efficiency and further cost reductions**
- **Will reach the market by the end of 2018**

Impacts

- **Potential to put Europe on the map of PV manufacturing**
- **15 direct jobs in an SME; incomparably more if successful**

Finance

- **Support: €15 million InnovFin EDP loan**
- **Project cost: €30 million**
- ***Only possible thanks to the enlargement of InnovFin EDP's scope in July 2017***



European Commission

InnovFin
Energy Demo Projects

Northvolt

Pilot manufacturing line of innovative battery cells in Sweden

- **Applications in the automotive, stationary energy storage and industrial segments – covering the full battery life cycle (including recycling)**
- **Large improvements in energy density, quality and cost structure**
- **High levels of standardization and automation; AI-based quality monitoring**

Impacts

- **World's greenest battery: production will emit 64% less CO2 compared to global competitors**
- **Demonstration site to employ up to 400 people**
- **Key step to deliver a planned EUR 4 billion, 32 GWh, 'gigafactory' in Europe**

Finance

- **Support: €52.5 million InnovFin EDP loan**
- **Project cost: €105 million**

WindFloat

Project characteristics

- **Floating offshore windfarm in Portugal**
- **Semi-submersible floating structure**
- **3 x 8,3 MW**
- **20 km from shore, water depth 85-100 m**

Risks and opportunities

- **Risks: new turbine, upscaling, structural integrity, wind resources**
- **Opportunities: deep seas, assembly in port, transport by tugboats**

Technological development

- **2011-2014 – FP7 "DEMOWFLOAT" project: pilot installation of 2 MW**

Finance

- **Support: €60 million InnovFin EDP loan + €30 million NER300 grant**
- **Total project cost: €131 million**

GreenWay

Project characteristics

- **Expansion of charging stations for electric cars in Central and Eastern Europe**
- **Ultra-fast charging system network of 150-350kW is a first-of-a-kind in Poland & Slovakia**
- **Third-party infrastructure integration (e.g. in shopping malls, restaurants, hotels)**
- **Smart charging management to enable a better management of local energy systems**

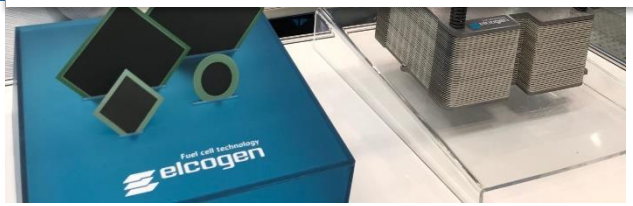
Risks and opportunities

- **First InnovFin EDP project in Central and Eastern Europe**
- **Helps solving the range problem faced by drivers**

Finance

- **Support: €17 million InnovFin EDP loan + €7.1 million CEF grants**
- **Total project cost: €34.1 million**

Elcogen



Project characteristics

- **Fuel cell company operating in Estonia and Finland**
- **First of a-kind 50MW automated manufacturing plant of highly efficient Solid Oxide Fuel Cells**
- **2 steps: cell production and assembly into stacks**

Technology

- **Competitive advantages:**
  - Lower operating temperatures (650 °C) at higher electrical conversion efficiency (74% vs 65%)
  - Lower OPEX thanks to standard materials and standard manufacturing processes
  - Operation in reverse mode as an electrolysis unit
  - Multi-fuel powered: natural gas, renewable methane and hydrogen

Synergies with other EU instruments

- **Six participations in FCH JU's projects; grant by the SME instrument**

Finance

- **Support: €12 million InnovFin EDP loan**
- **Total project cost: €30 million**

INNOVATION FUND

Volume of at least EUR 10 billion at current carbon prices

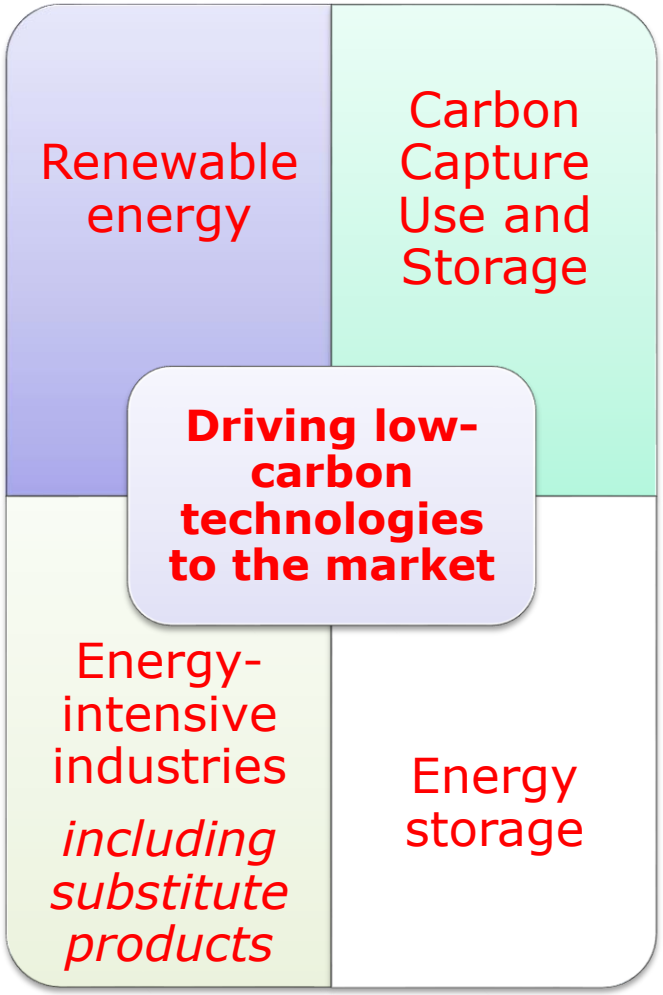
Support of up to **60% of additional costs** related to innovative technology

First call (grants) expected for **2020** and **regular calls** up to 2030

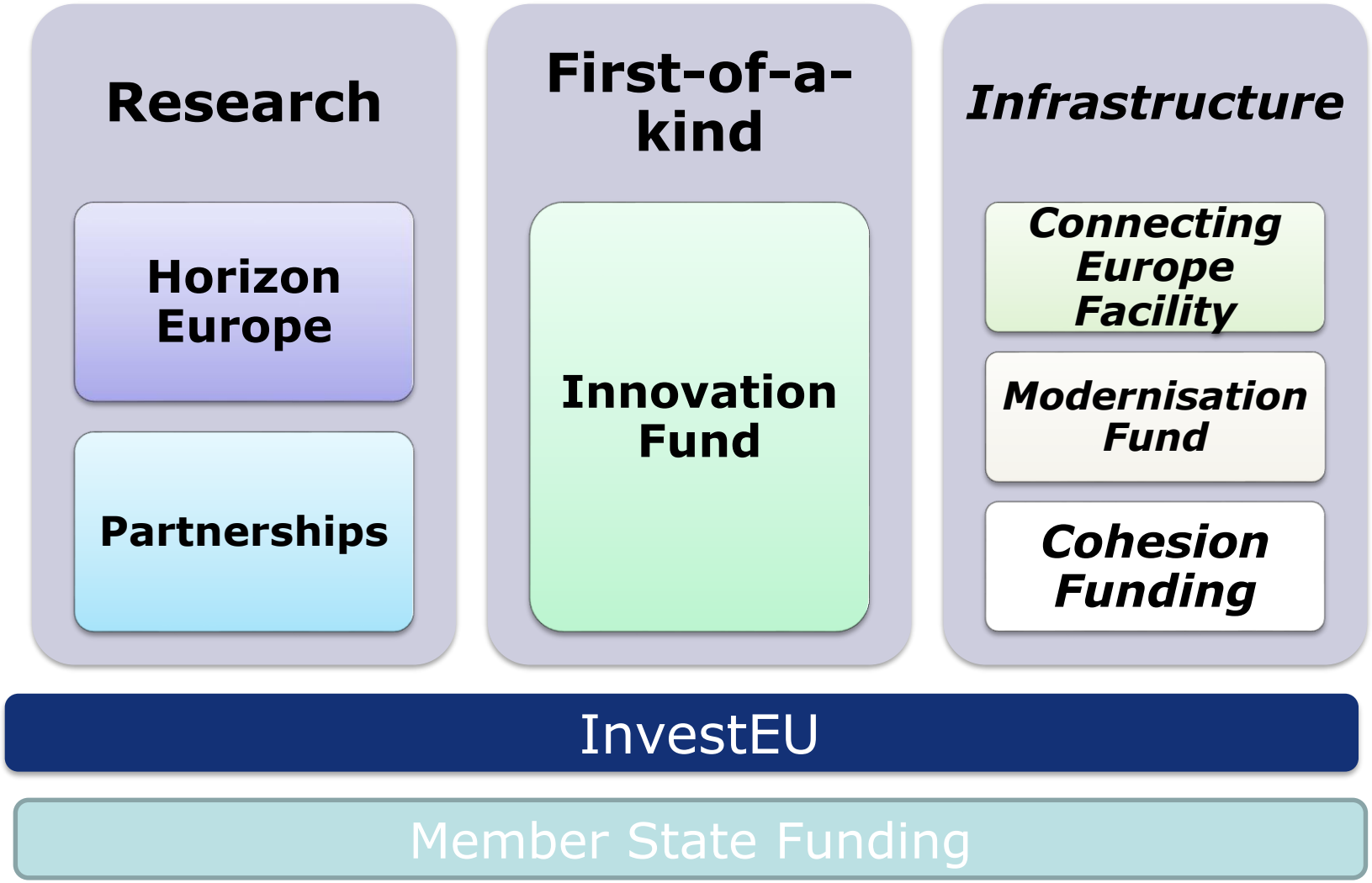
Financed from the revenues of the **EU Emissions Trading System**

Support of additional capital **and** operating costs (up to 10 years)

Comprehensive selection criteria and **project development assistance**



INNOVATION FUND COMPLEMENTARITIES



Selection criteria
Greenhouse gas emissions avoidance
Degree of innovation
Project maturity
Scalability
Cost efficiency

Breakthrough Energy Ventures Europe (BEV-E)
Joint Investment Fund

- EC and Breakthrough Energy signed MoU to set up 100 m EUR Joint Investment Fund
- Initial contribution of each side to be 50 m each
- Term sheet finalized
- Objective: to help innovative European companies develop and bring radically new clean energy technologies to the market

EIC Accelerator Pilot – EIC Fund
Step-by-step

Blended finance only

Submission of Proposals

Remote Evaluation

Ranking of Proposals

Interview

Grant Agreement

In case of blended finance option — Due Diligence

In case of blended finance option — Equity Investment