European Commission

InnovFin EDP Facility

Financial Instruments for Clean Energy Innovation

InnovFin
Energy Demo Projects

Agustin Escardino

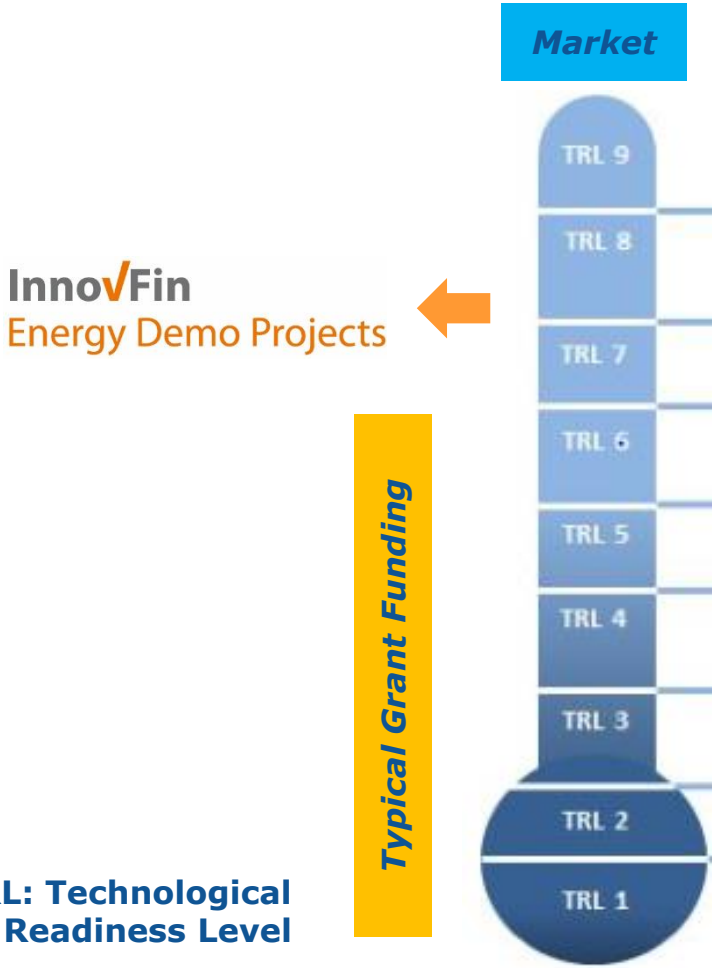
Deputy Head of the Renewable Energy Unit, &
Leader for InnovFin EDP
DG Research & Innovation
European Commission

The New Frontier for Wind Power

First-of-a-kind demonstration projects

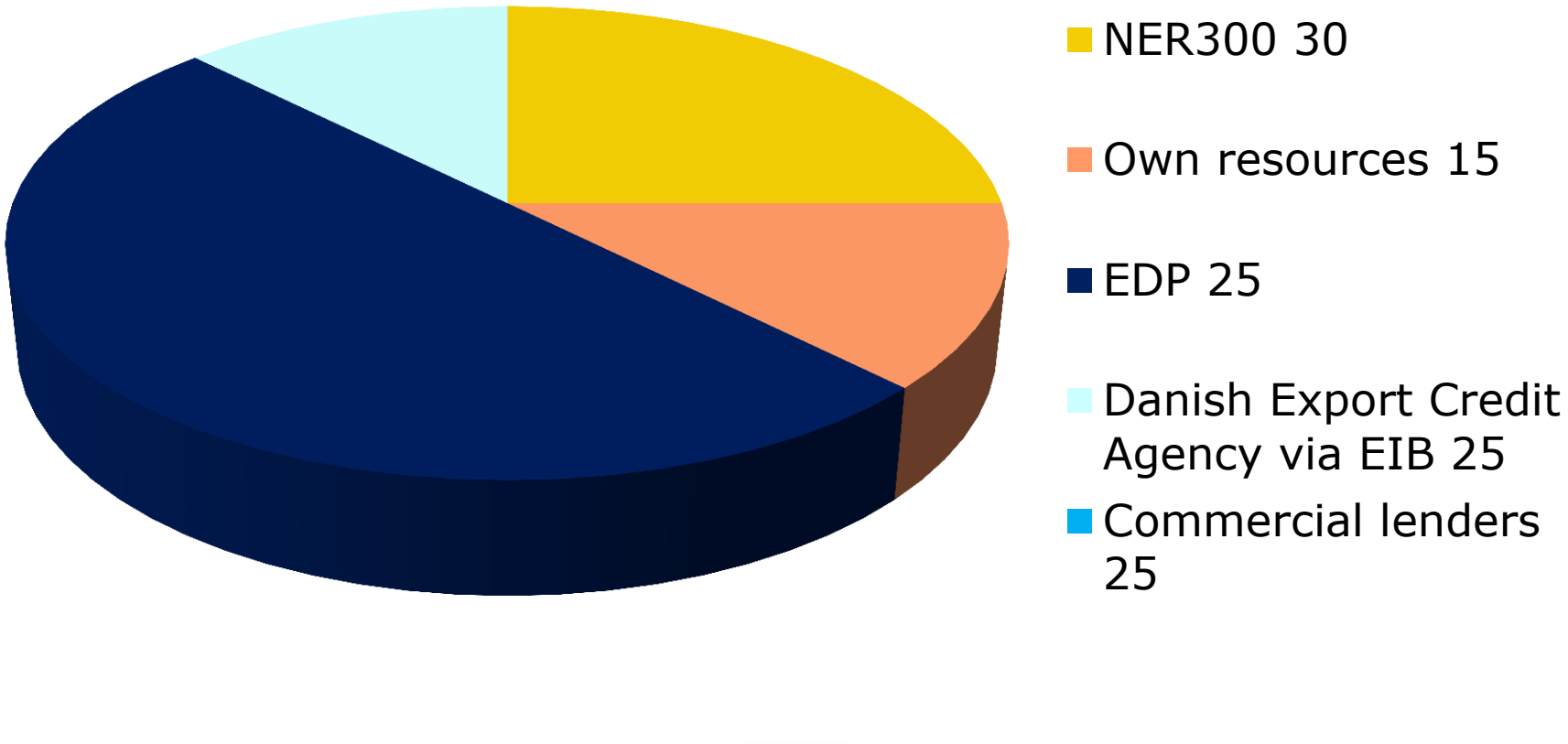
- 
  - **Crucial to keep / regain EU's technological leadership in clean energy**

- **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)



Example of FOAK commercial-scale demo

Example of financial engineering of FOAK

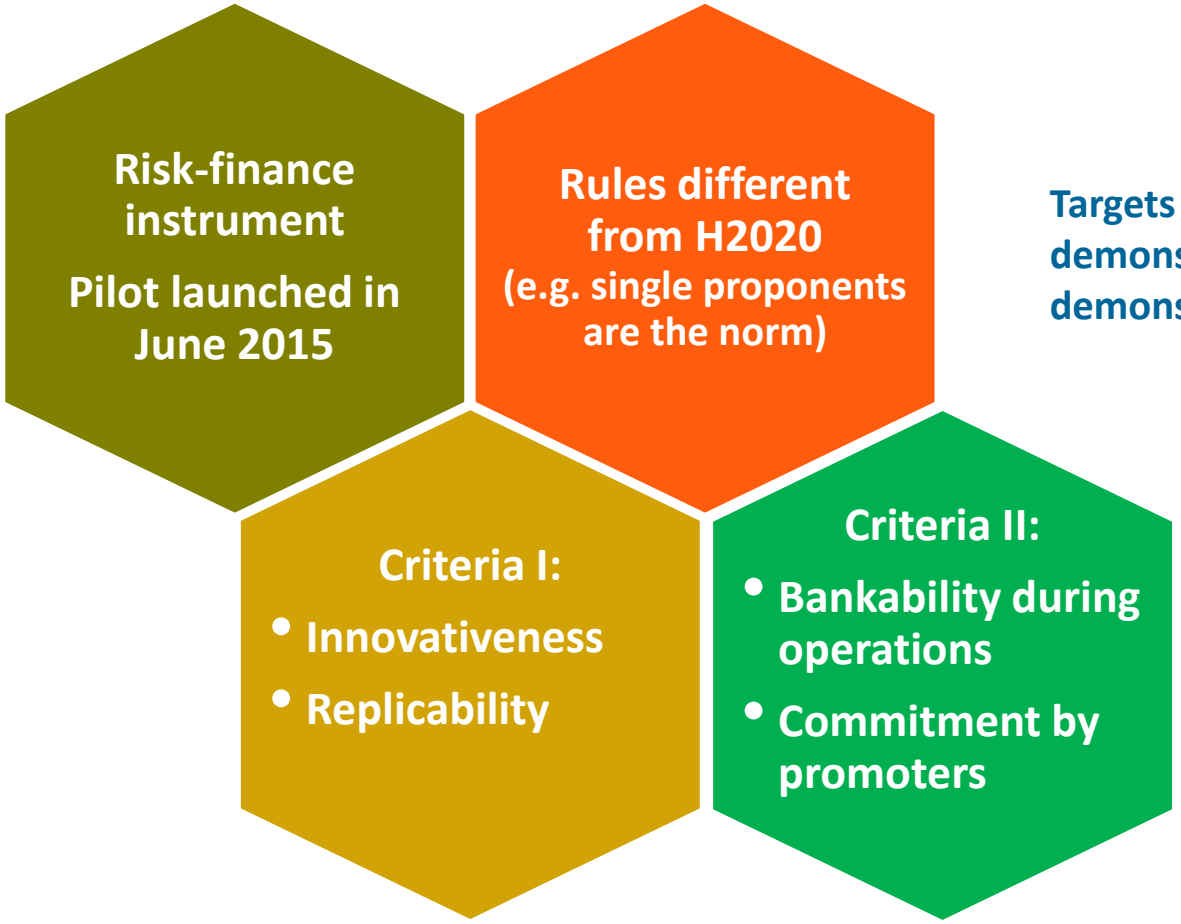


MoU on setting up of Joint Investment Fund

- 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 to be now developed fast
- Objective: to help innovative European companies develop and bring radically new clean energy technologies to the market.

Basic features

InnoVFin
Energy Demo Projects



Targets innovative first-of-a-kind demonstration projects ready to be demonstrated at commercial scale

Designed for a higher level of risk than any other EU financial instrument

European Commission

Basic features

InnoVFin
Energy Demo Projects

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

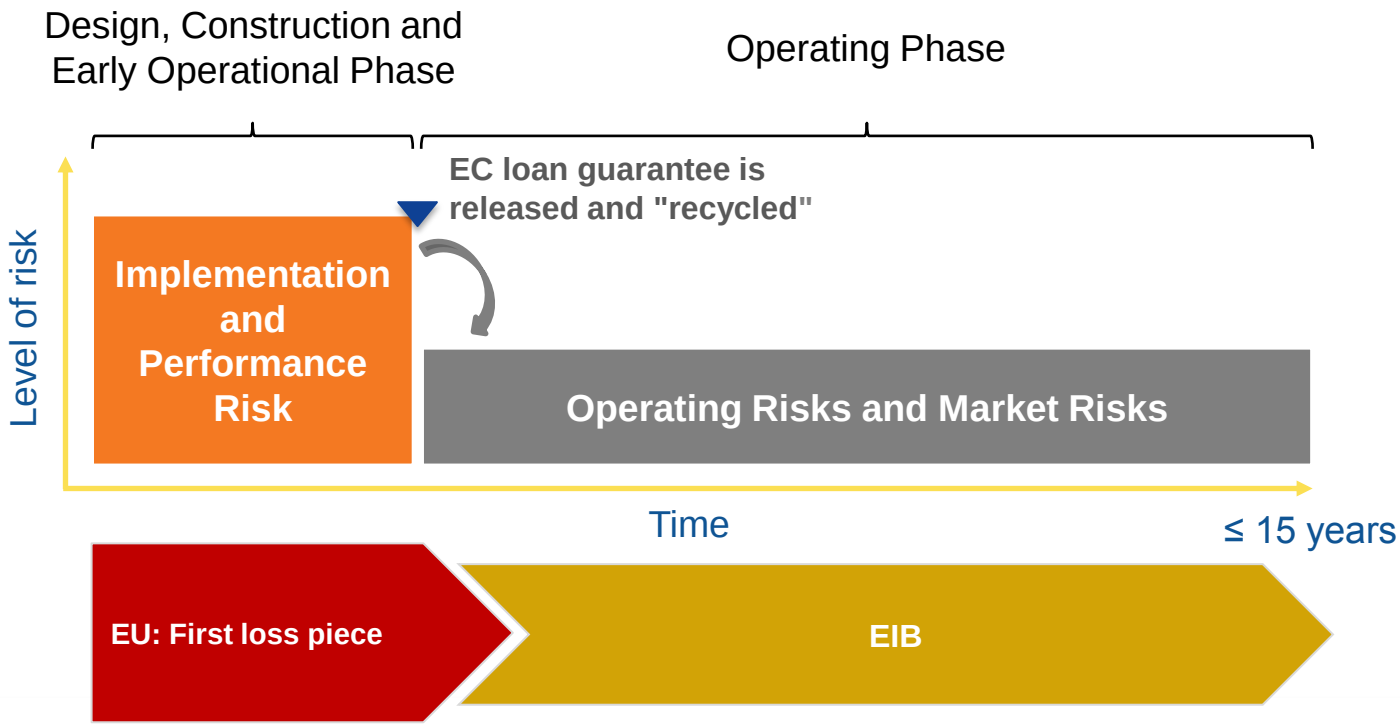
Up to € 800 million

European Investment Bank The EU bank

EUROPEAN INVESTMENT FUND

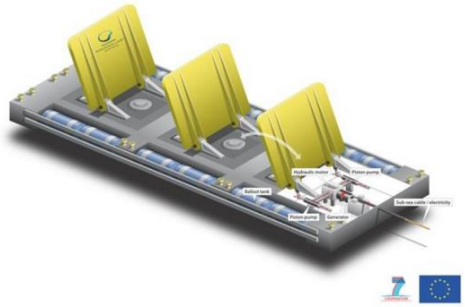
How it works

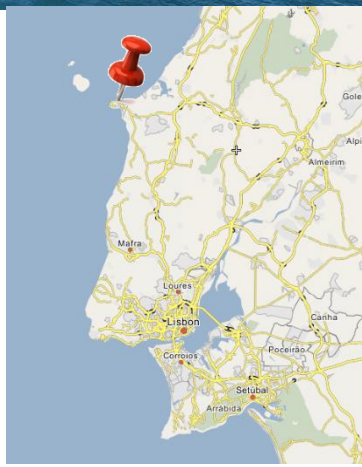
- **EIB provides loans with a max. tenor of 15 years and covering up to 50% of project costs**
- **EC (via Horizon 2020) provides a guarantee on the loan covering the riskiest phase of the project**



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





CHO-TIPER

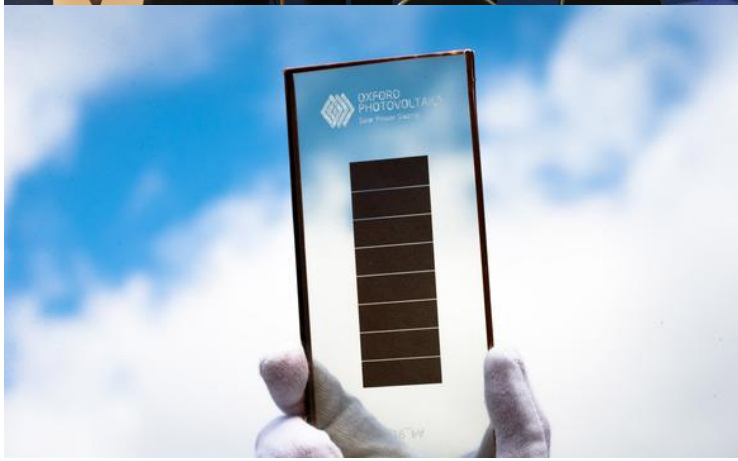
- **Innovative gasification plant in France**
  - **Uses the highly efficient plasma torch gasification technique**
  - **Feedstock: wood residues, commercial and industrial waste**
  - **Thermal process where organic matter reacts at very high temperatures with a controlled amount of oxygen and/or steam without combustion to produce a gas composed of mostly CO and H2 (syngas)**
  - **The gas is then burned in a gas turbine to produce electricity and heat**
  - **Much more efficient and clean than the often used waste incineration**
- **Impacts**
  - **Expected to cut carbon-dioxide emissions by 30,000 tons per year**
  - **Around 60 direct jobs in an SME; much more foreseen with the prospects of growth**
- **Finance**
  - **Support: €28 million InnovFin EDP loan**
  - **Project cost: €62 million**

European Commission

InnovFin
Energy Demo Projects

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

Conclusion

- **InnovFin EDP supports EU's ambition is to lead on low-carbon clean technologies**
- **Public fund is needed to address market failures that slow down technological development**
- **Horizon 2020 is among the pioneers in Europe to design such a risk-finance scheme**
- **Innovative blending-finance schemes are being developed to improve InnovFin EDP's design**