Ecosystem session: RENEWABLE ENERGY

Clusters strengthening ecosystems

European Commission

EUROPEAN CLUSTER COLLABORATION PLATFORM .eu

Federal Ministry for Economic Affairs and Energy

Clusters strengthening ecosystems

Renewable energy

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New energy technologies, innovation and competitiveness

European Commission

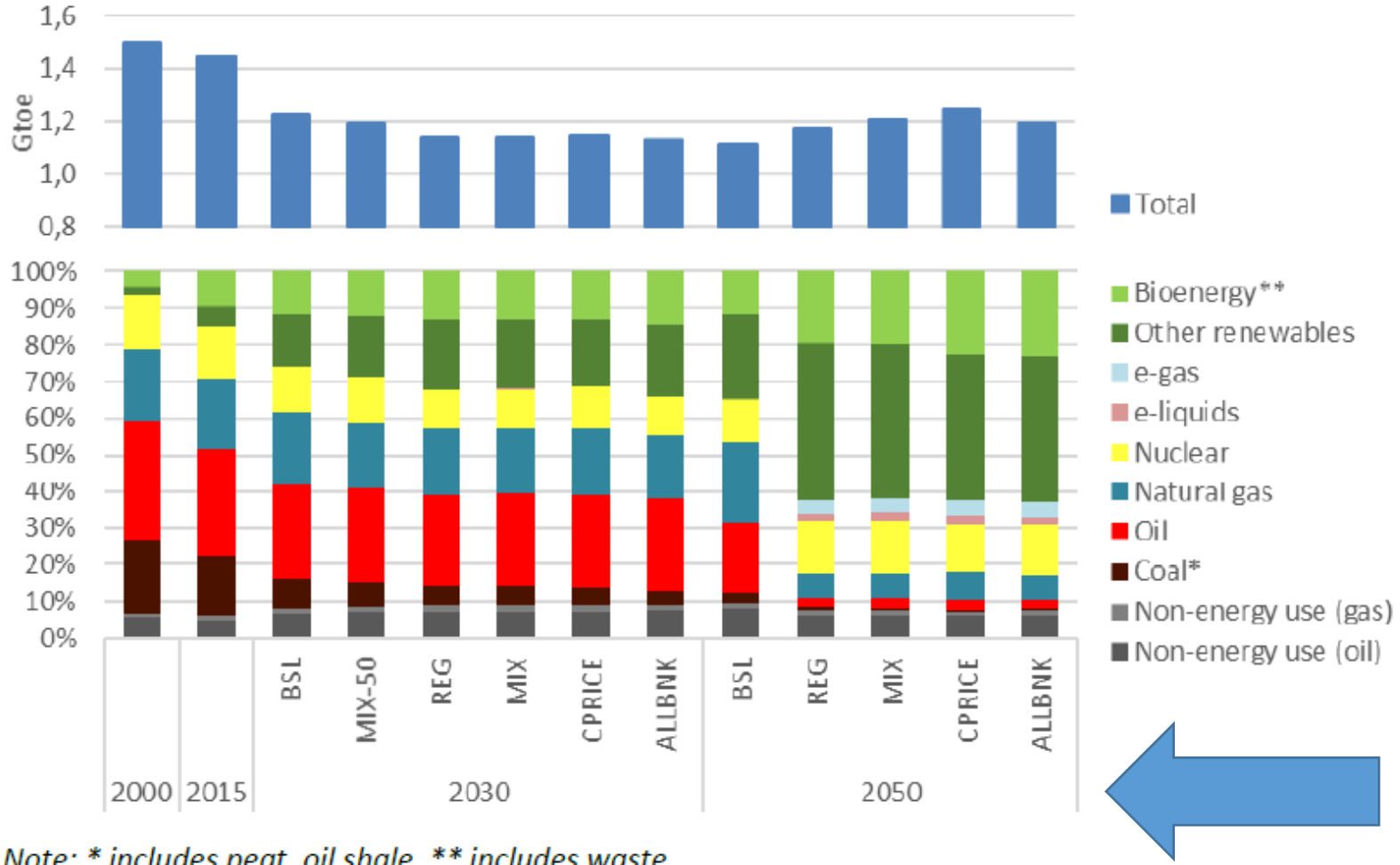
EUROPEAN CLUSTER COLLABORATION PLATFORM .eu

Federal Ministry for Economic Affairs and Energy

Setting the context
A New Industrial Strategy for Europe

*"We will need a **more strategic approach to renewable energy industries**, such as offshore energy, and the supply chain underpinning them. This will also help cater for a **substantial increase in the amount of electricity required by the twin transitions**. This should be supported by efforts to **better connect Europe's electricity systems** to increase security of electricity supply and integrate more renewables."*

Setting the context

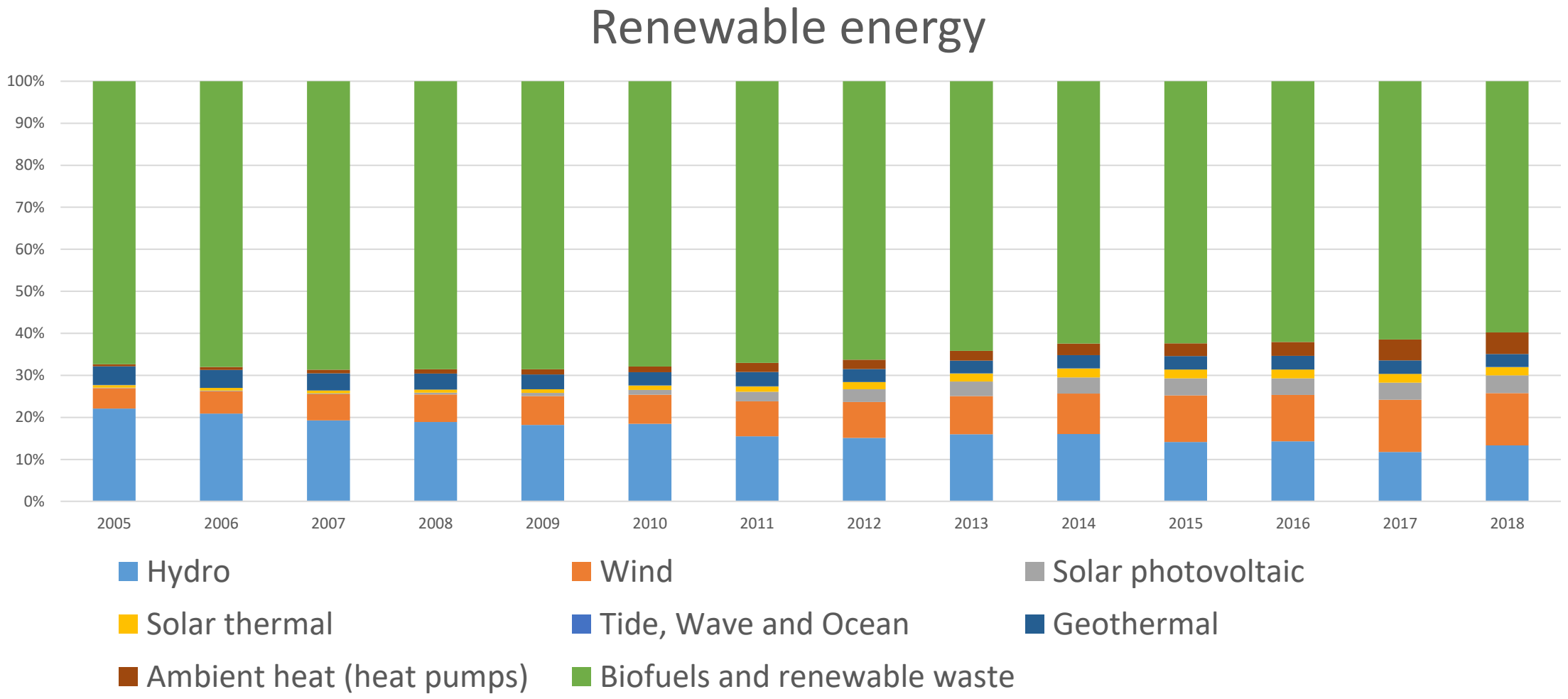


*Note: * includes peat, oil shale, ** includes waste*

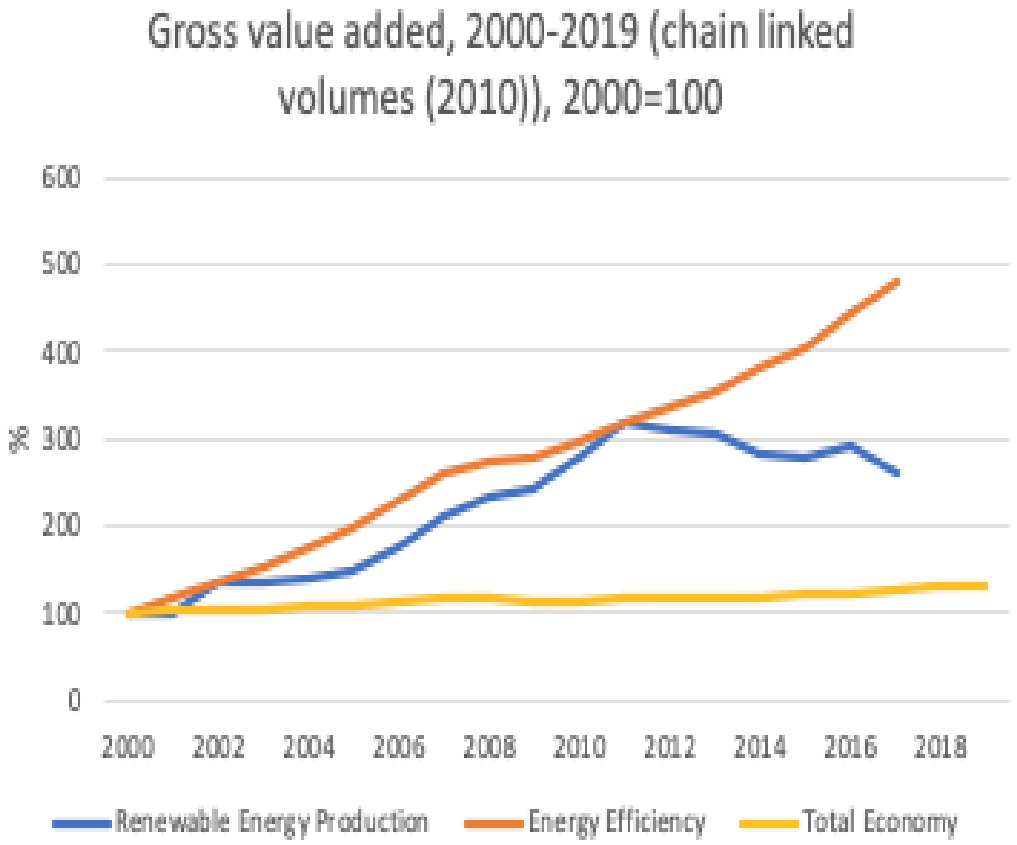
Source: 2000, 2015: Eurostat, 2030-2050: PRIMES model

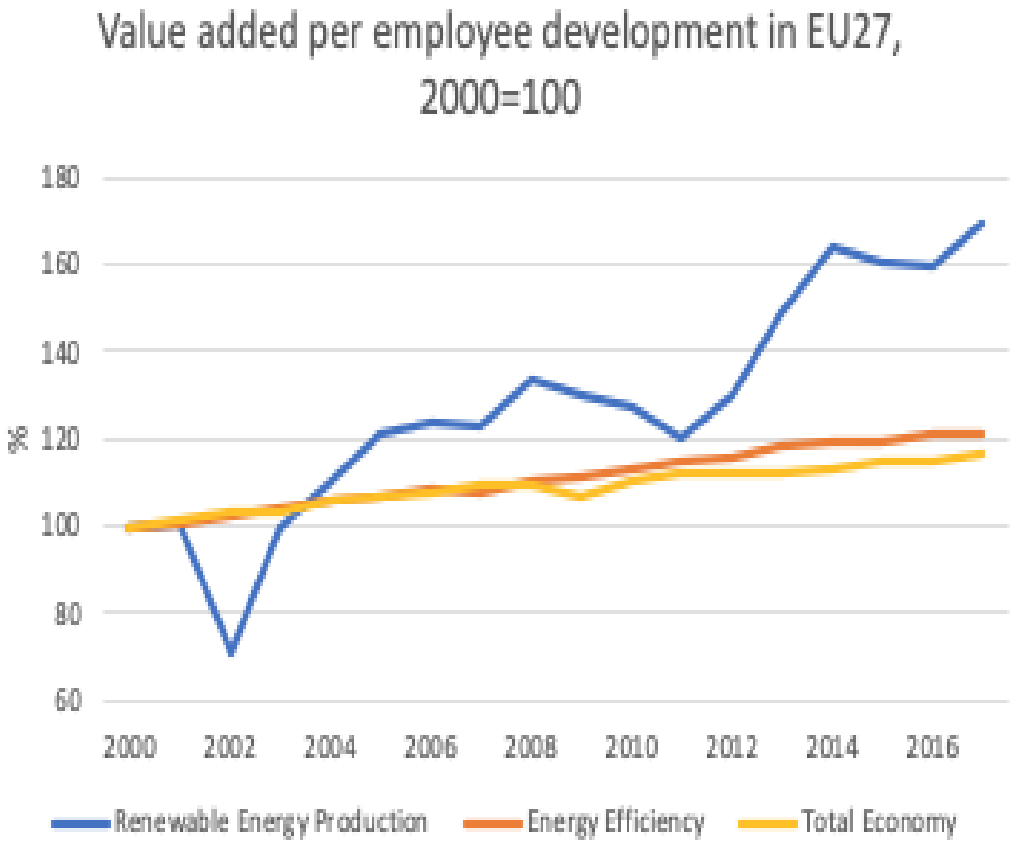
- **EU Climate Target Plan**: Proposal to cut net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels, up from our current target for 2030 of at least 40%.
- **Role of renewables in this process**

Which sectors/areas are we talking about?



How is this ecosystem situated in the whole European market?





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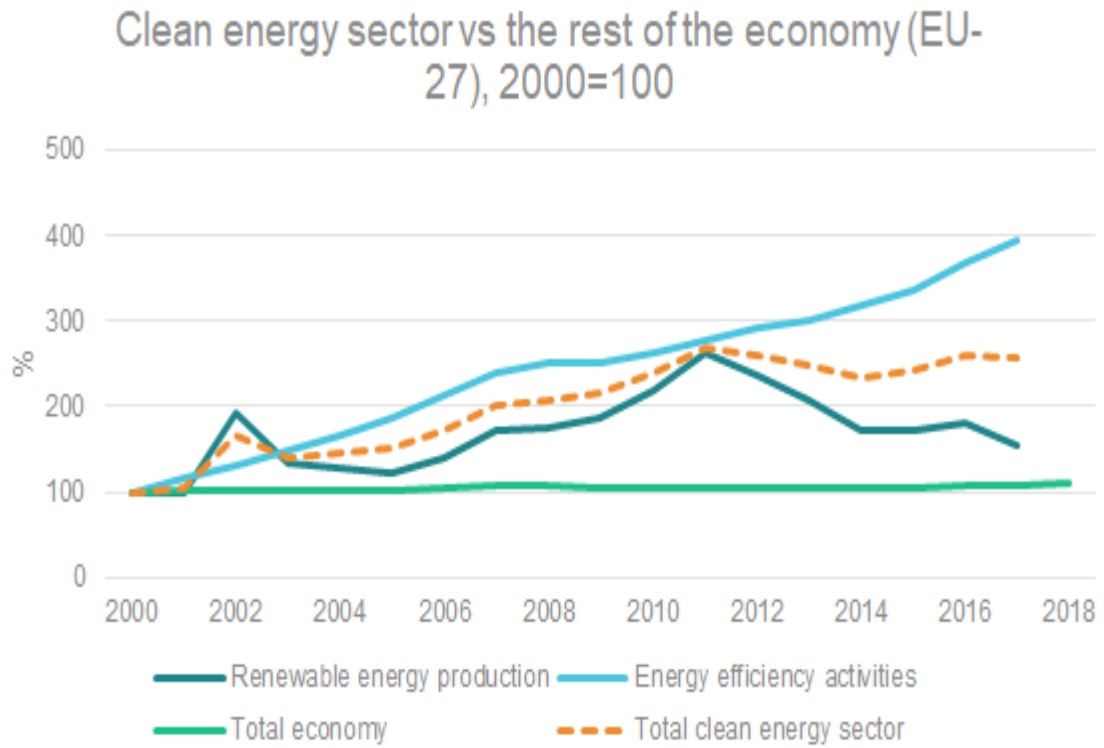
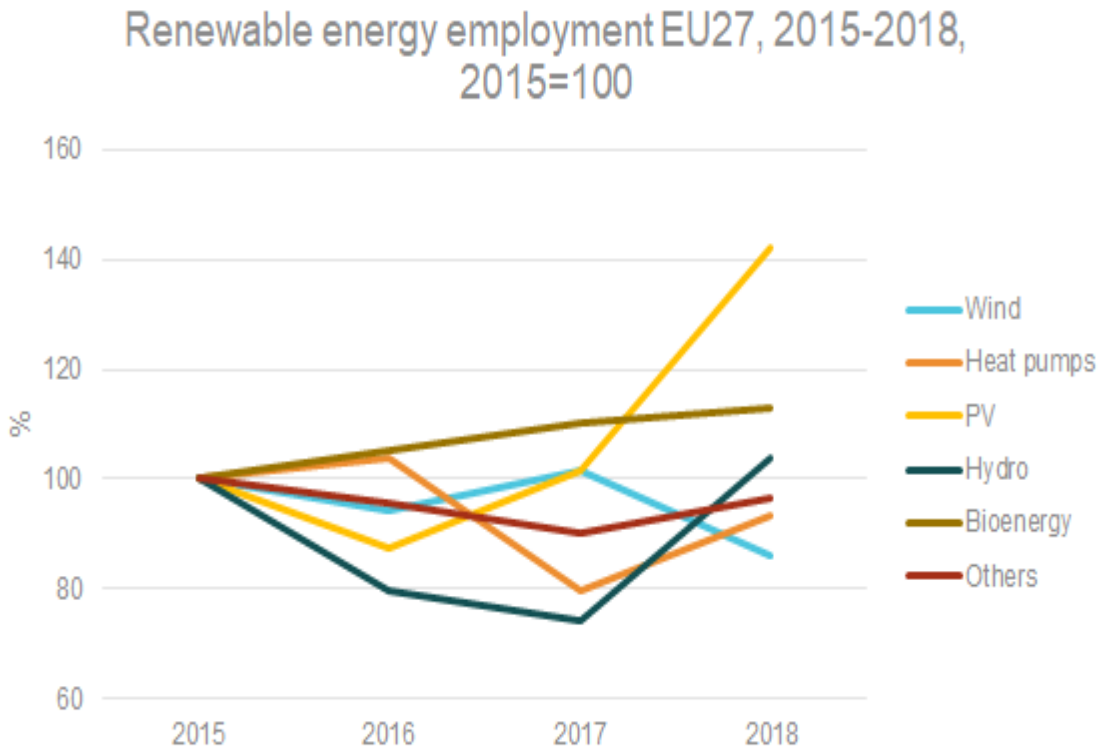


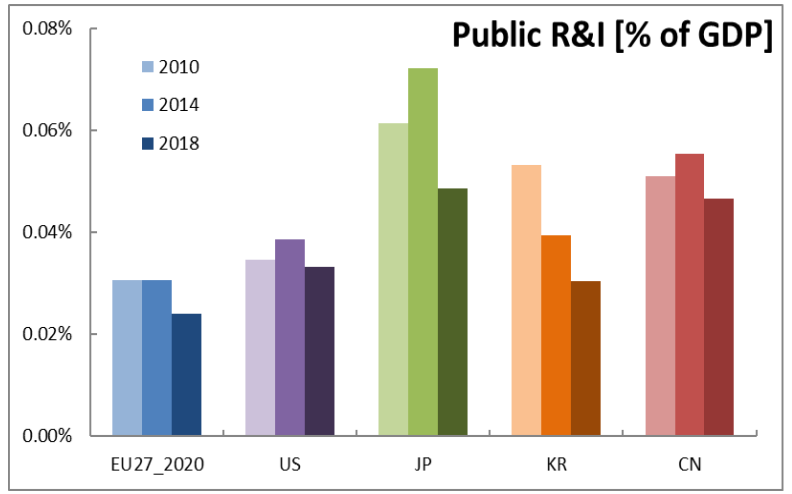


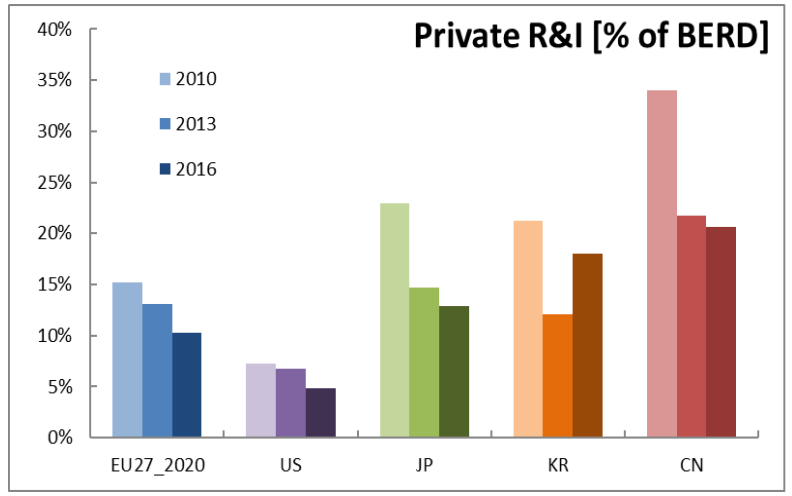
Case study - Offshore wind

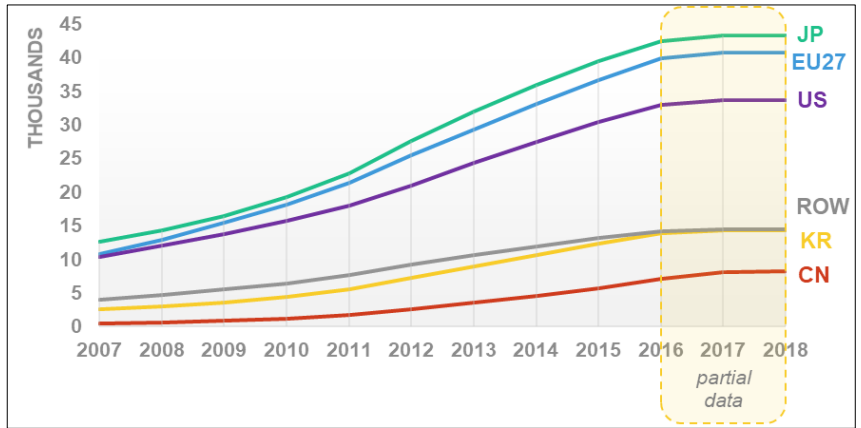
- Recent offshore wind projects have observed much increased capacity factors (+70% between 2015 and 2018) due to sustained R&I efforts.
- The EU has a first mover advantage and is leading the innovation in floating offshore with about 350MW wind parks being built until 2024, which is about 62% of the global floating offshore construction plan.
- About 93% of the total offshore capacity installed in EU in 2019 produced locally by European manufacturers (Siemens Gamesa Renewable Energy, MHI Vestas and Senvion).
- The EU28 share of global exports increased from 28% in 2016 to 47% in 2018.
  - Positive trade balance, with a rising trend;
  - 8 out of the top 10 global exporters were EU countries;
  - Global market demands such as floating may become key for EU industry.

Current challenges

- **Declining MS national budgets devoted to clean energy R&I**, with the lowest investment among major global economies when measured as a share of the GDP (*Link recovery*).
- **Declining private sector investments** in the Energy Union R&I priorities, with only a small share of revenues currently spent on R&I in the sectors
- **Declining patenting activity** in clean energy technologies since 2012, although European Union generally files “higher value” patents.







RENEWABLE ENERGY: A LEADING EUROPEAN INDUSTRIAL ECOSYSTEM

Jose I. Hormaeche
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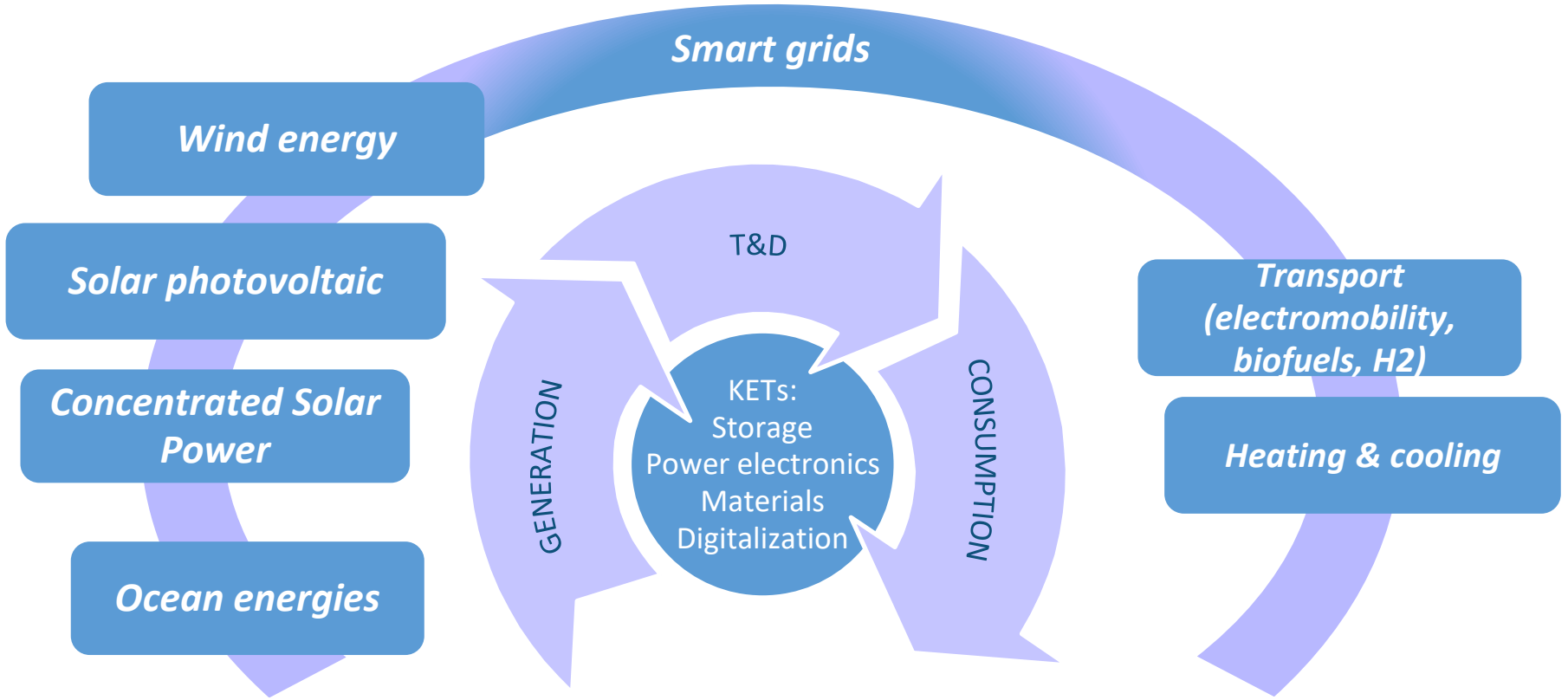
VALUE CHAINS IN THE EUROPEAN RENEWABLE INDUSTRIAL ECOSYSTEM

Turnover 2019

€ 158.9 billion

Jobs 2019

1.5 million



"The EU's political priority of becoming the world leader in renewables is underpinned by the presence of renewables in all dimensions of the Energy Union. Technology leadership is prominent in the clean energy sector (in particular in wind, ocean, smart grid technologies and renewable hydrogen), but continuing efforts are needed to catch up and build a competitive edge in batteries and solar photovoltaic."

Source: "Renewable Energy Progress Report", European Commission, 14/10/2020

"WIND ENERGY BASQUE COUNTRY" VALUE CREATION NETWORK

wind energy BASQUE COUNTRY

WIND FARM DEVELOPMENT
IBERDROLA

WIND TURBINE OEM
SIEMENS Gamesa RENEWABLE ENERGY

ENGINEERING
SENER IDOM

WIND TURBINE SYSTEMS & COMPONENTS
LAULAGUN bearings, Ingeteam, JAURE, antec, GLUAL, HINE, Indar, MEKATAR GROUP, ERREKA, INTZA, trafag sensors & controls, Rexroth Bosch Group, GUREAK

CONTROL & MONITORING SYSTEMS
NEM solutions, Ibermática

INSTALLATION & MAINTENANCE
aerblade, texascontrols, euskabea, ALERION, S.G.I. GALEA, S.L., TAMOIN, eldu

TOWERS, FOUNDATIONS & FLOATING PLATFORMS
haizea wind, euskalforging, NAVACEL, BeuginGaray, mugape, ESTEYCO, saitec, nautilus, VICINAY marine, SENER, IDOM, ISATI engineering solutions, itsaskorda, IRIZAR FORGE

GRID CONNECTION & SUBSTATIONS
ORMAZABAL velatia, M mesa, ALKARGO, ditrel Industrial S.L., arteche, ZIV

LIFTING & SAFETY EQUIPMENT
KIMUA., Supra, slingsintt, incomimex, PROTECTION Protección Técnica, HWS

PORT SERVICES
Bilbao PORT, Uniport Bilbao

RESEARCH & TECHNOLOGY ORGANIZATIONS
bimep, IK4, tecnalia Inspiring Business, Universidad del País Vasco Euskal Herriko Unibertsitatea, MONDRAGON UNIBERTSITATEA, windbox

Powered by:
Cluster Energía BASQUE ENERGY CLUSTER

COLLABORATIVE R&D PROJECTS in TECHNOLOGY CHALLENGES of the WIND SECTOR: digitalization, floating offshore, modules manufacturing, . . .

REGIONAL R&D INITIATIVES

SEAPOWER

Offshore solutions for the foundations, towers and auxiliary systems of high power offshore wind turbines

MODEOL

New technological generation for wind power modules

IOENERGY

Digitization of critical components with support and optimization of digital platforms and test benches

HARSH

Technologies for the design, advanced manufacturing and validation of components for energy facilities in offshore environments

flow

Development of a floating wind turbine for a full-scale demonstration

EU PROJECTS LED BY BASQUE PARTNERS

INNTEST ING

Development of innovative virtual and hybrid testing methods for prototype validation of pitch bearing and gearbox components.

Horizon 2020
European Union Funding
For Research & Innovation

DOCC-OFF

Digitalization of the pitch hydraulic system of offshore wind turbines and data availability for analysis

With the contribution of the European Maritime and Fisheries Fund of the European Union

Interreg Atlantic Area
European Regional Development Fund
EUROPEAN UNION
DURABLE

Improvement of the performance of renewable energies through aerospace technologies in robotics for operation and maintenance of wind and solar energy systems.

ELBE
EUROPE LEADING BLUE ENERGY

Positioning Europe as the world technological and industrial leader in Blue Energy, with a special focus on floating offshore wind, wave and tidal energy.

ESCPsi
ELBE

COSME project "Clusters Go International": EUROPEAN LEADERS OF BLUE ENERGY (ESCP-4i ELBE+)

CONSORTIUM

5 TARGET MARKETS

ELBE+ targets 5 countries beyond Europe :

- USA (FOW, BFOW and Wave Energy)
- Canada (Tidal Energy)
- Japan, South Korea, Taiwan (FOW, BFOW and Wave Energy)

KEY ACTIVITIES 2020-2022

- 7 Customized Market Reports
- 2 Exploratory Trips to Emerging Markets
- 6 Direct and Reverse Missions
- 3 European Networking Events
- 5 Cooperation Agreements

BUILDING ON ELBE ACTIVITIES 2018-2019

3 European Networking Events → Joint internationalisation strategy → Participation of 112 organisations → 192 B2B meetings → 123 collaboration opportunities

ELBE
EUROPEAN LEADERS OF BLUE ENERGY

Co-funded by the COSME programme of the European Union

ESCP-i ELBE Partnership

EUROPEAN CLUSTERS: key drivers of cross-sectorial and cross-regional collaboration to build competitive industrial ecosystems

Renewable plant developers and operators, utilities,

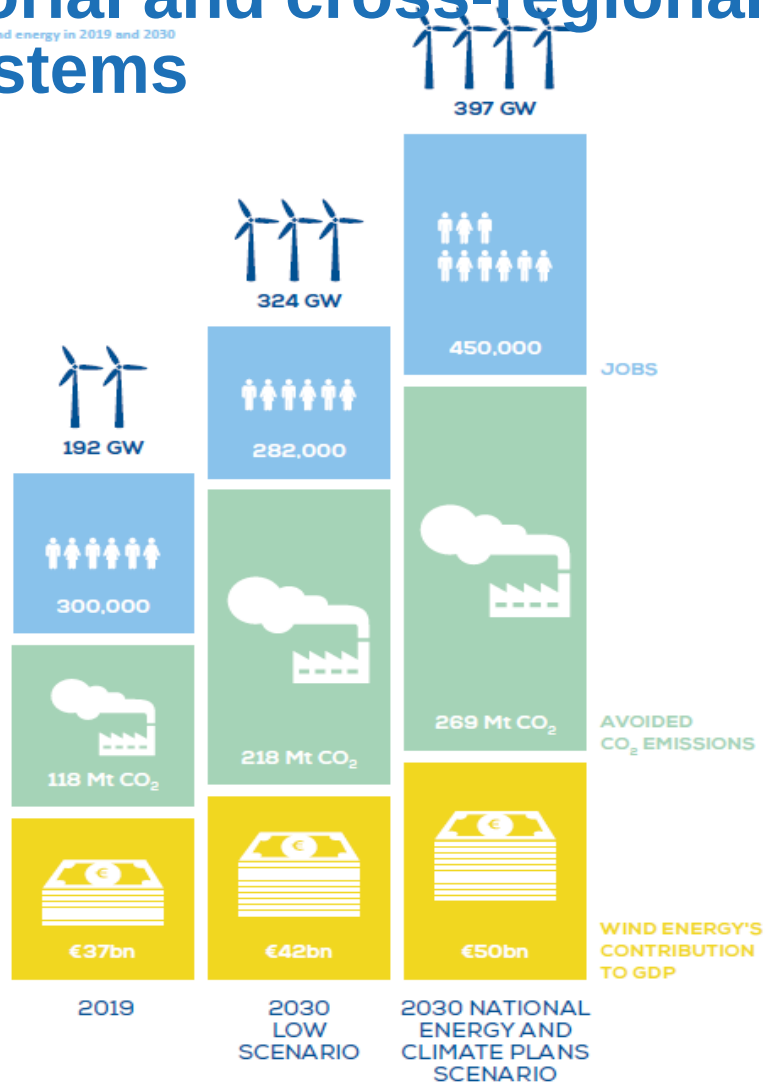
OEMs (Tier 1), EPC contractors, O&M services

Component and System Suppliers (Tier 2 and 3), Engineering firms

Software developers, communications, Big Data, Data analytics, AI, cybersecurity ….

Academia: Research Centers, Universities, Testing Labs and experimental sites

ENERGY
DIGITAL
MANUFACTURING
CLUSTERS
CLEANTECH
Others
. . .
MARITIME



Cluster Energía
BASQUE ENERGY CLUSTER

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Back up slides

Renewable technologies analysis based on Competitiveness Progress Report

Current challenges and opportunities based on recent competitiveness analysis

- In the **wind, renewable hydrogen and ocean energy industry**, the expected, multifold increase in the capacity size of the markets suggests that the industry's structure will inevitably change: expertise needs to be pooled across companies and Member States and companies have to re-structure and pool their value chains to realise the required economies of scale and positive spill overs.

- Sustained efforts to catch up and build a competitive edge is also relevant in areas where the EU does not hold (anymore) a first mover advantage. For the **solar PV industry**, considerable market opportunities exist in the segments of the value chain where specialisation or high performance/high value products are key.

Current challenges and opportunities based on recent competitiveness analysis

- For **renewable fuels** the key issue is to shift from first to second and third generation fuels so that the feedstock becomes sustainable, and to optimise its use. To do so, scale up to increase industrial production, via demonstration projects, will be important moving forward.
- To increase the availability of sustainable biofuels beyond the limited waste and residue feed-stocks, it is important to lower costs and risks through large scale demonstration of the key production pathways (pyrolysis, gasification, fermentation).
- In parallel, large R&I investments could help to gain experience and push technology development in the currently limited e-fuel development, while maintaining the EU's competitive edge through first of a kind plants, demonstrations and scaling up.

Current challenges and opportunities based on recent competitiveness analysis

- For **hydropower**: Current EU28 market: EUR 25 billion, with European companies present in major value chain segments (e.g. design, manufacturing and supply of hydropower equipment, R&D and civil works)

  Challenge: use repowering/refurbishment of older installations as an opportunity to radically reduce their environmental footprint.

- For **geothermal**: EU is a net exporter of services for geothermal energy projects and equipment

  EU-funded projects advance the state-of-the art, mainly for exploration (drilling), new materials/tools and the enhancement of reservoirs.

Current challenges and opportunities based on recent competitiveness analysis

- **Solar thermal:** EU companies have traditionally been leaders in all value chain segments of the *solar thermal power* technology.

  However, to face its US and emerging Chinese competitors and to maintain and expand its competiveness, it is important for the EU industry to improve the performance and the cost effectiveness of solar thermal power plants.