ETIP Wind

EUROPEAN TECHNOLOGY & INNOVATION PLATFORM ON **WIND ENERGY**

Executive Committee meeting

March 2020

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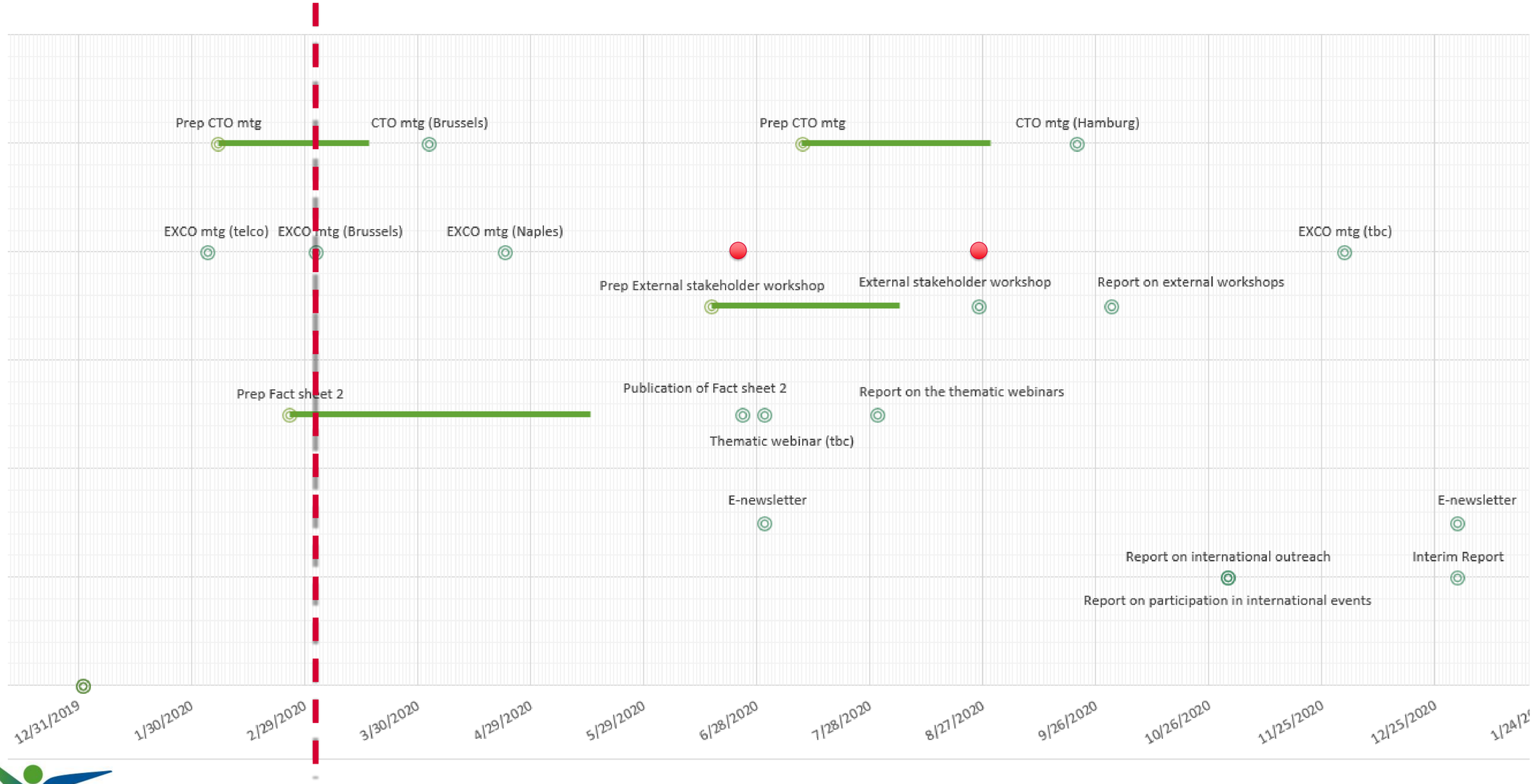
This report has been produced with support of the European Commission. The views represented in the presentation are those of its authors and do not represent the views or official position of the European Commission.

Alexander Vandenberghe

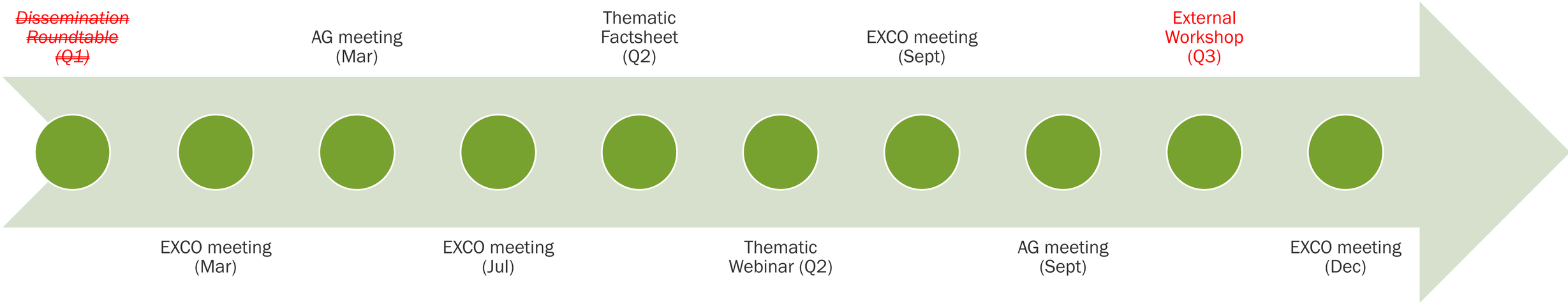
Advisor Research & Innovation

TIMING	AGENDA ITEM	SCOPE
09:30 – 10:00	**Registration**	
10:00 – 10:10	**Introduction, competition compliance and agenda** By Aidan Cronin, Executive Committee Chair	**approval minor decision**
10:10 – 10:30	**Sustainability, environment and materials** • Impacts of the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) on the wind energy sector By ETIPWind secretariat	**information**
10:30 – 11:00	**Offshore grid technology gap analysis** • Feedback on HVDC workshop (05/02) • Roundtable discussion	**discussion**
11:00 – 12:00	**Roundtable: Technology Outlook for climate neutrality by 2050** • Wind energy deployment • Wind energy technology development • Enabling technologies	**discussion**
12:00 – 13:00	**Lunch**	
13:00 – 13:30	**European R&I policies and instruments** By ETIPWind secretariat	**information**
13:30 – 16:00	**Scoping workshop – floating offshore wind factsheet** • State-of-art (45 min) • Technology challenges (45 min) • Break (15 min) • Potential of floating wind (45 min)	**discussion**
16:00 – 16:30	**Consolidation of workshop** By ETIPWind secretariat	**approval major decision**
16:30-16:45	**AOB**	**discussion**
16:45 – 17:00	**Closing remarks and next steps** Aidan Cronin, Executive Committee Chair	

Indicative 2020 work programme



ETIPWind 2020 activities



Sustainability, environment and materials

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European policy outlook – environmental regulation

Lead subject to REACh authorisation?: State of play

- **REACH Regulation (EC 1907/2006):**

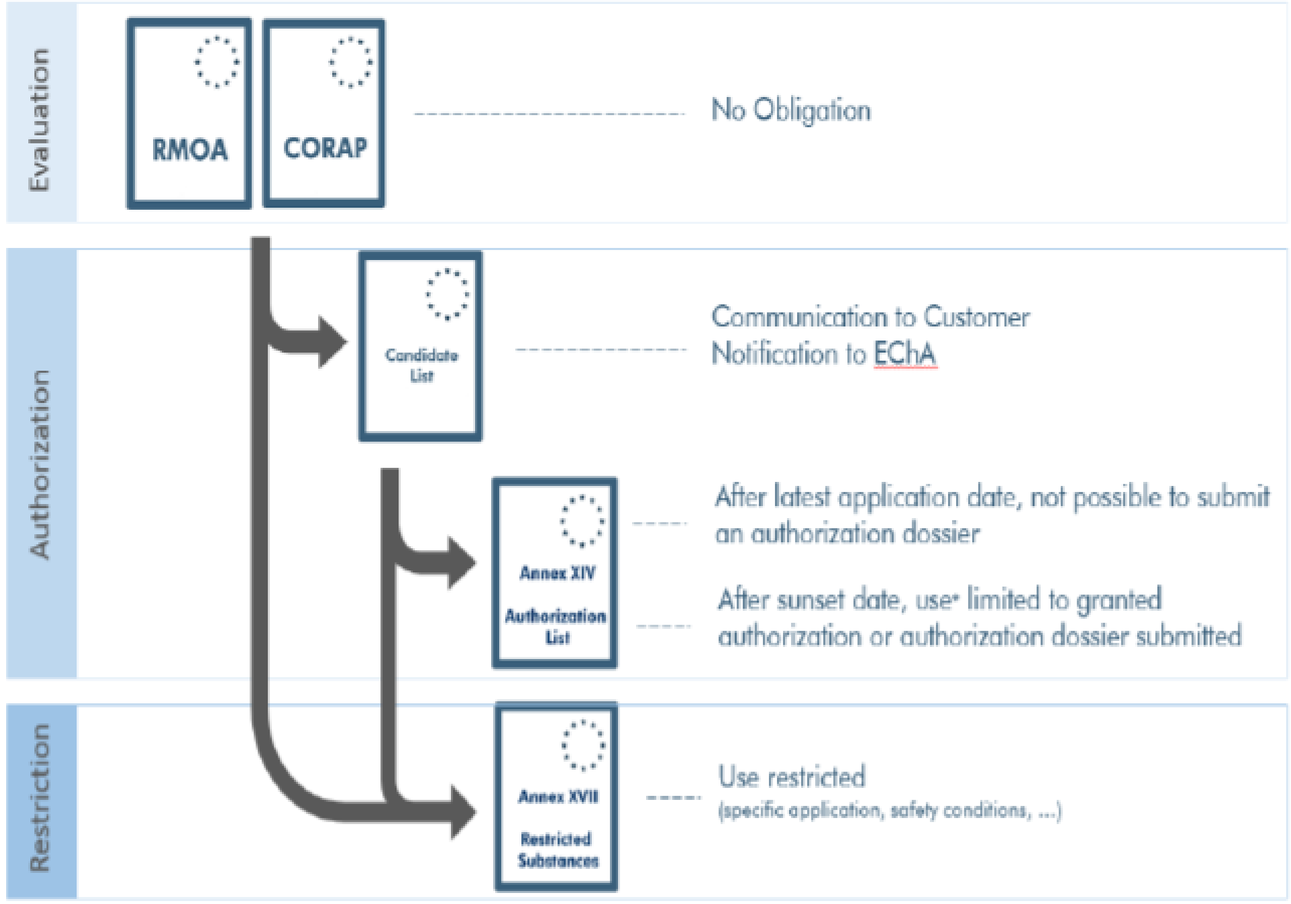
  Legal framework governing the safe use of chemicals in the internal market. It concerns the 'Registration, Evaluation, Authorisation and Restriction of Chemicals.'

- **Authorisation:**

  REACH mechanism designed to deal with the risks assumed to be presented by substances of very high concern ('SVHC').

- Process for SVHC inclusion in authorisation annex:
  - (i) identification as an SVHC,
  - (ii) inclusion on 'Candidate list',
  - (iii) prioritization, and
  - (iv) inclusion in Annex XIV REACH.

➢ ***SVHCs on the REACH authorisation Annex (XIV) cannot be placed on the market for use, or to be used, in the EU unless the company has been authorised to do so.***



Source: Europacable

European policy outlook – environmental regulation

- Lead proposed to go to annex IV of the REACH regulation (chemicals)
  - Could mean lead could not be put in the market for use, nor be used in the EU as of 2024 except by companies with an ‘authorization of use’.

Source: Europacable

More wind, more cables, more lead?

Year	DC LAND System km			DC Submarine System km			Grand TOTAL
	320kV	>320kV	Total	320kV	>320kV	Total	
2019	100	-	100	1,057	1,618	2,675	2,775
2020	103	-	103	1,747	2,660	4,407	4,510
2021	103	1,870	1,973	2,340	1,750	4,090	6,063
2022	-	2,403	2,403	2,110	1,273	3,383	5,786
2023	330	2,483	2,813	2,855	1,265	4,120	6,933
2024	330	2,484	2,814	2,870	1,345	4,215	7,029
2025	150	-	150	1,325	1,105	2,430	2,580
2026	510	-	510	1,200	690	1,890	2,400
2027	360	30	390	570	430	1,000	1,390
2028	-	30	30	1,710	270	1,980	2,010
2029	-	-	-	1,640	70	1,710	1,710
Total	1,986	9,300	11,286	19,424	12,476	31,900	43,186

Source: EuropaCable (in the context of the ENTSO-E TYNDP 2018)

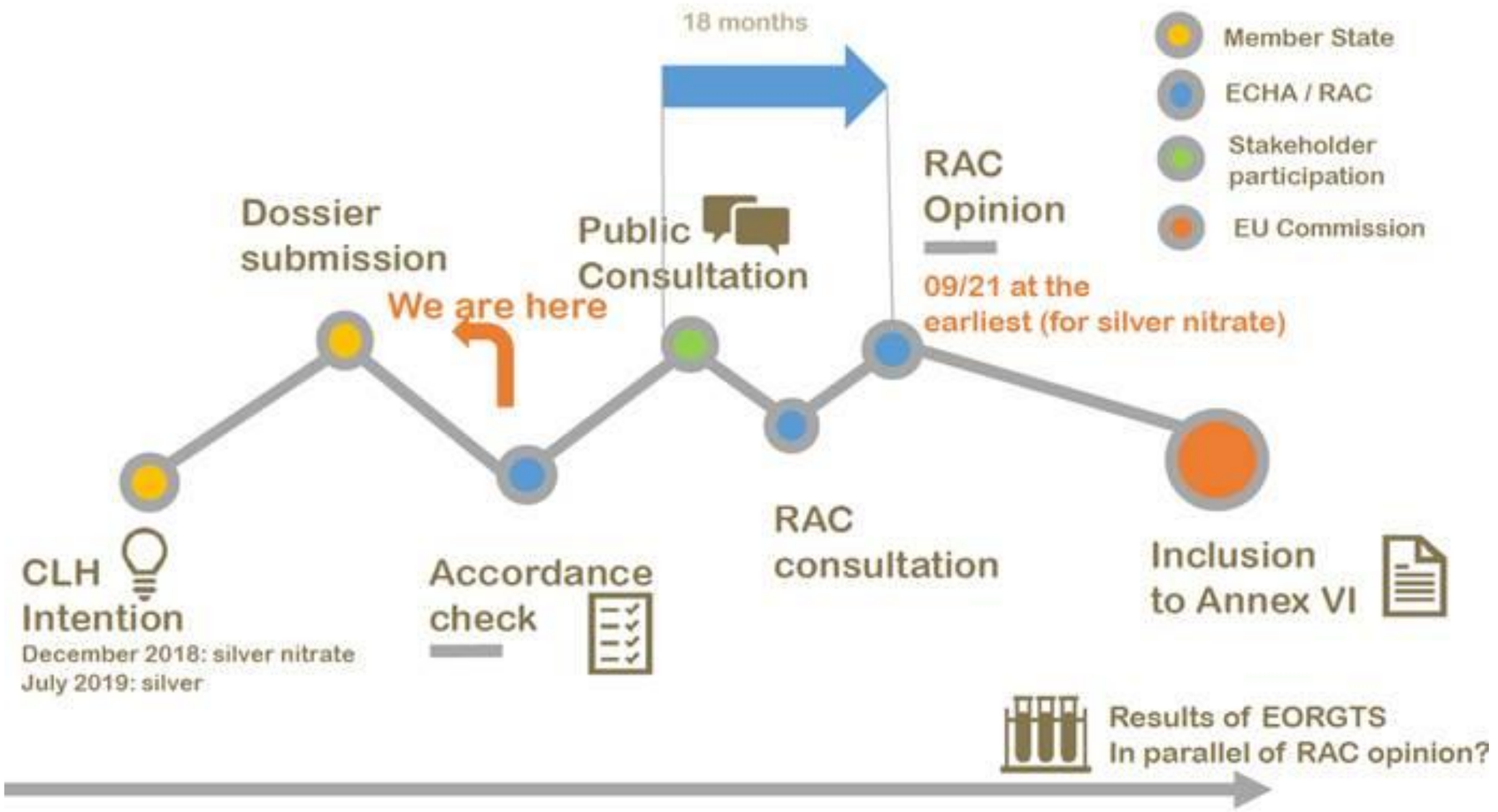
Development of lead-free cables

- Medium priority in the ETIPWind Roadmap.
- What is the current technology readiness level of lead-free cables?
- How realistic is wide-spread market uptake of lead-free alternatives by 2024 and by 2030?
- What would the overall cost impact of importing export cables, notably from China, be?

(source: Farinia Group FMGC)

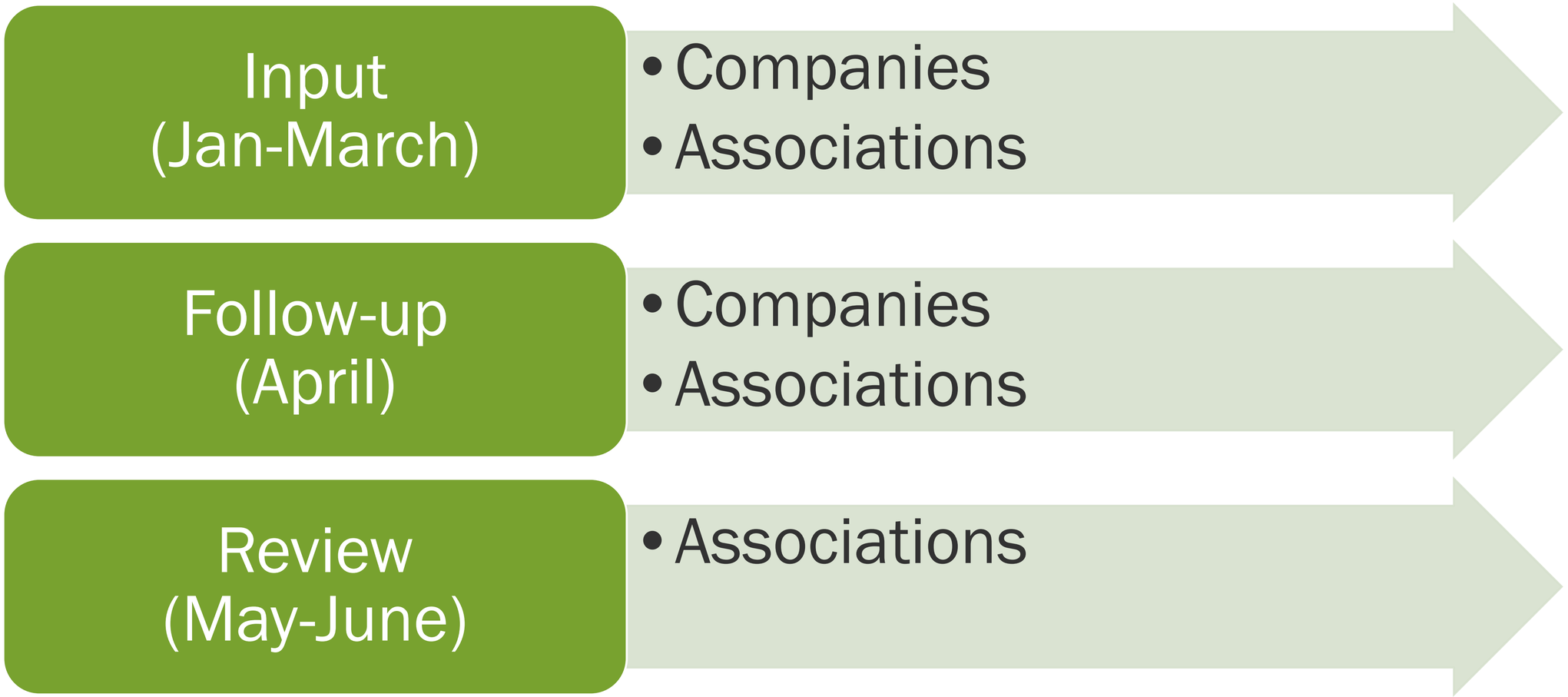
European policy outlook – environmental regulation

- Silver and Silver Nitrate to be reclassified? (Swedish chemical agency)



Source: EPMF

European Precious Metals Federation Surveys



MI survey: Manufacturers & Importers
DU survey: Downstream Users

Offshore Grid technology gap analysis (?)

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Roundtable
Technology Outlook

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Technology Outlook

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Objectives

Deliver facts-based messages on the role of wind energy in the energy transition

- How much can wind deliver by 2030 – 2050
  - Low, medium and high scenario
- Provide factual and technical data on the costs of wind
- What are the quantifiable socio-economic benefits of wind

Objectives

How to deliver carbon-neutral by 2050 with technology

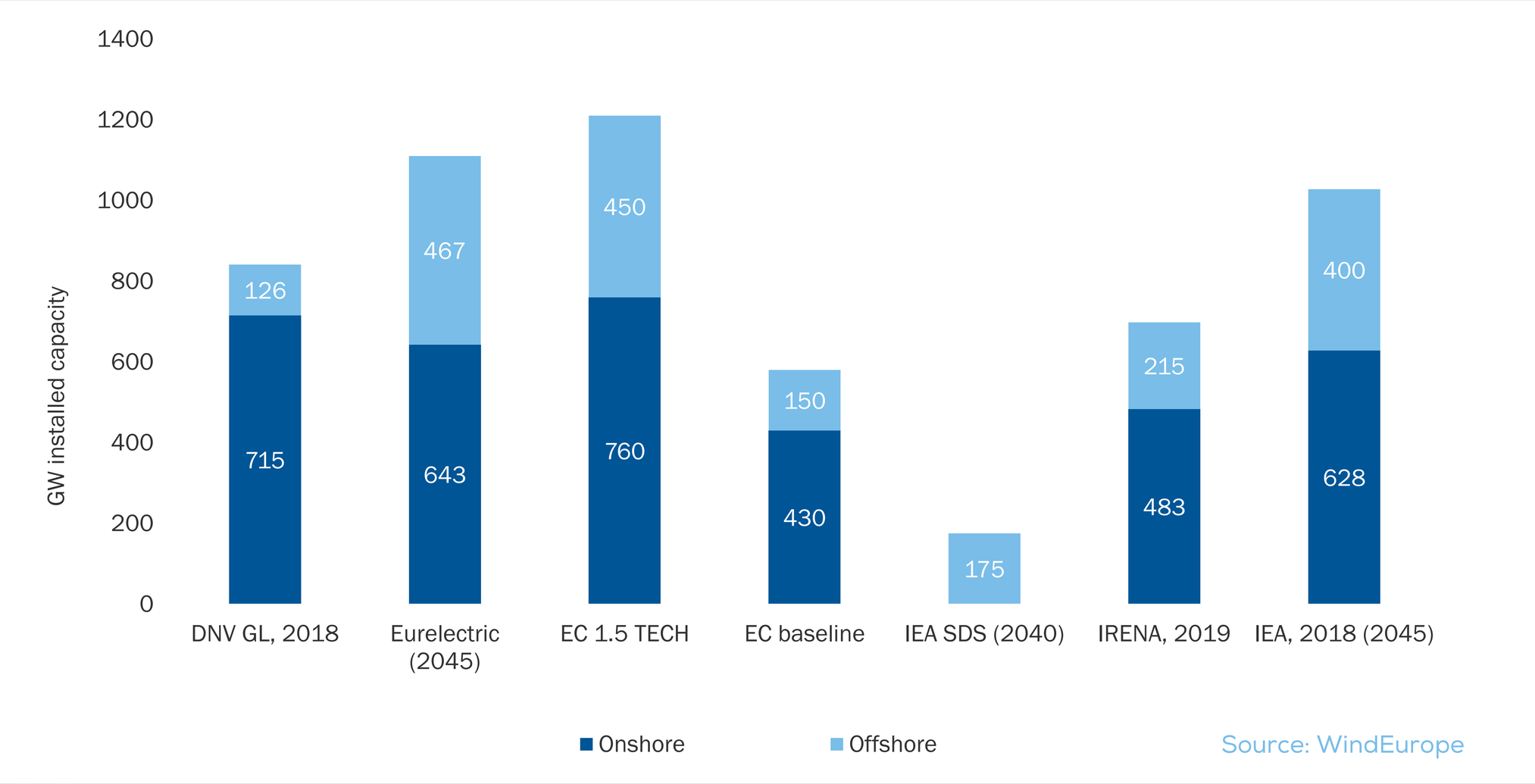
- Enabling technologies (materials, grids, demand-side electrification)

- Wind energy technology
  - Turbine technology
  - Manufacturing
  - Operations
  - End-of-life

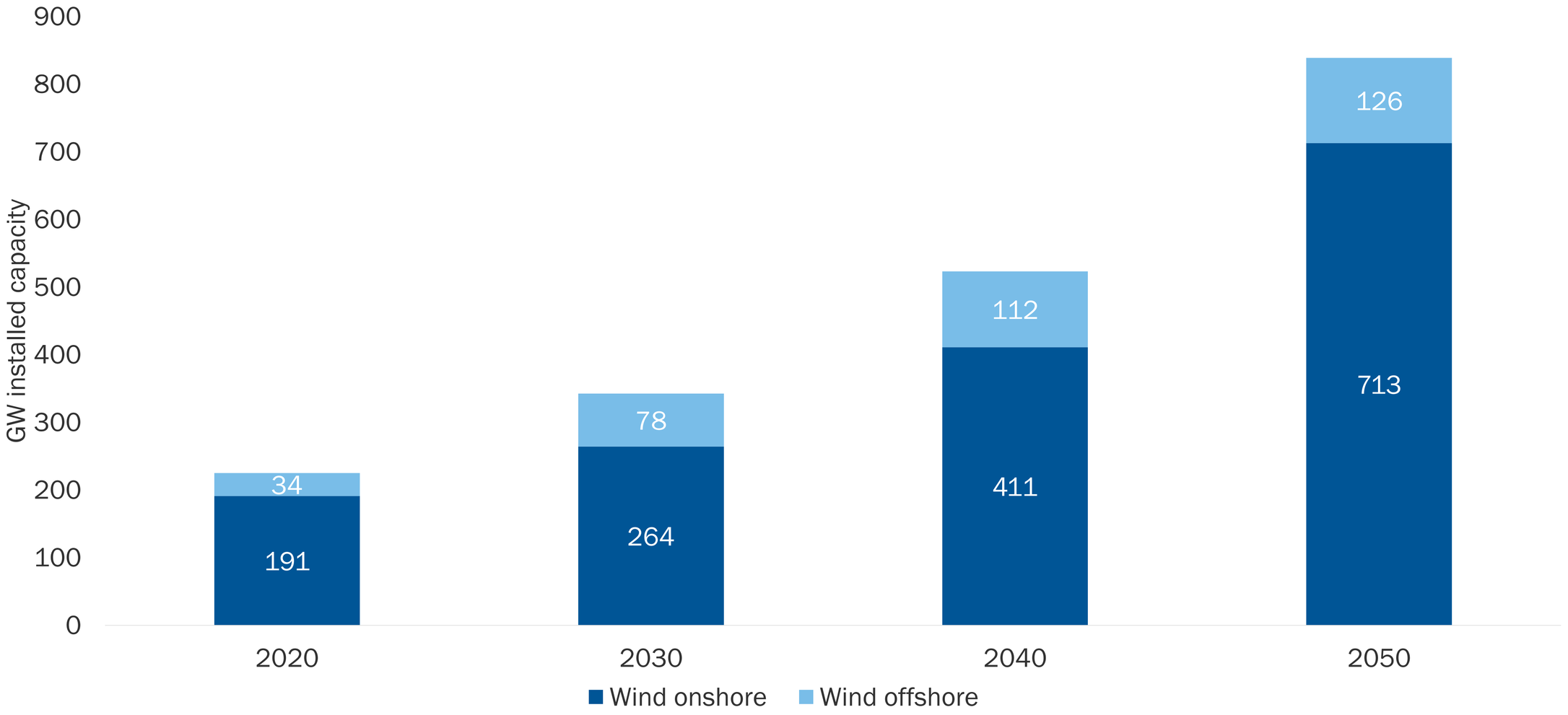
Wind power numbers

	2020-2030			2030-2040			2040-2050		
	low	medium	high	low	medium	high	low	medium	high
Wind power									
- Deployment									
- GW capacity									
- n° turbines									
- share of wind									
- Costs (project)									
- capex									
- opex									

Plenty of scenarios…

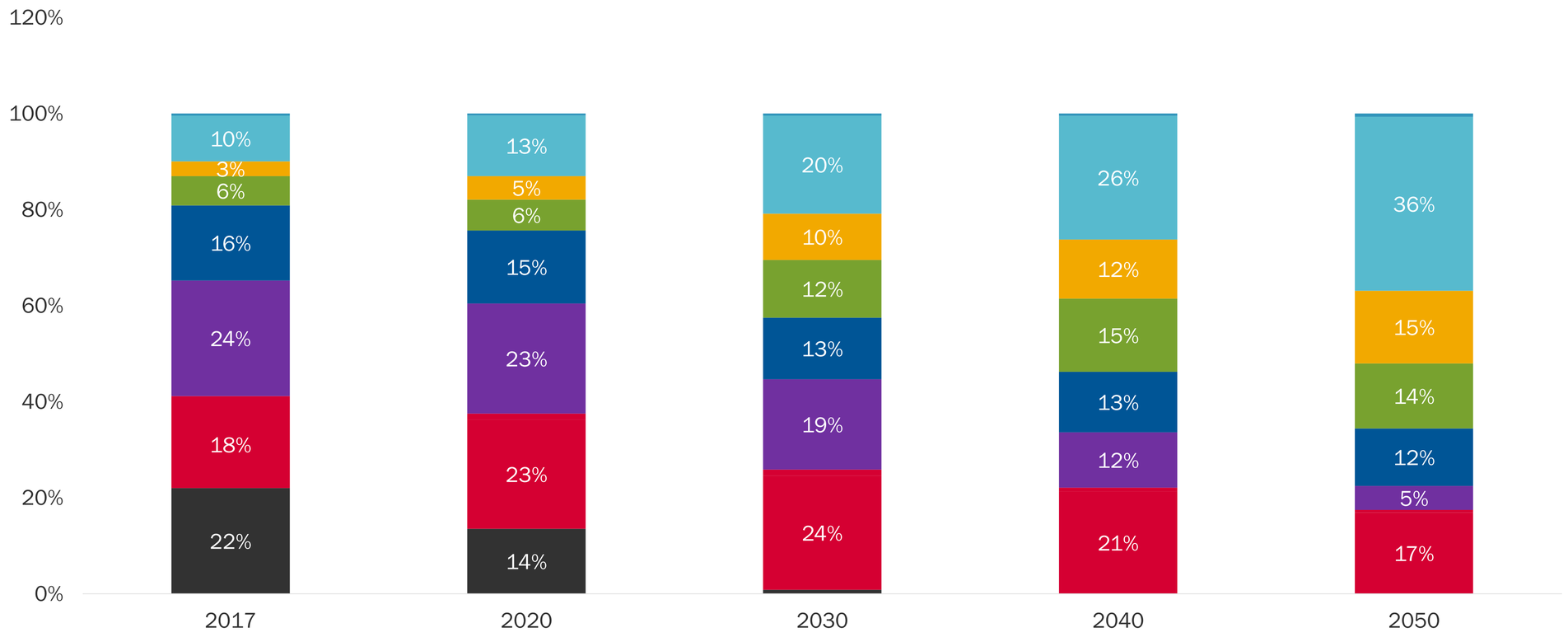


Breaking New Ground – wind deployment



Source: DNV GL for WindEurope

Breaking New Ground – electricity mix



Source: DNV GL for WindEurope

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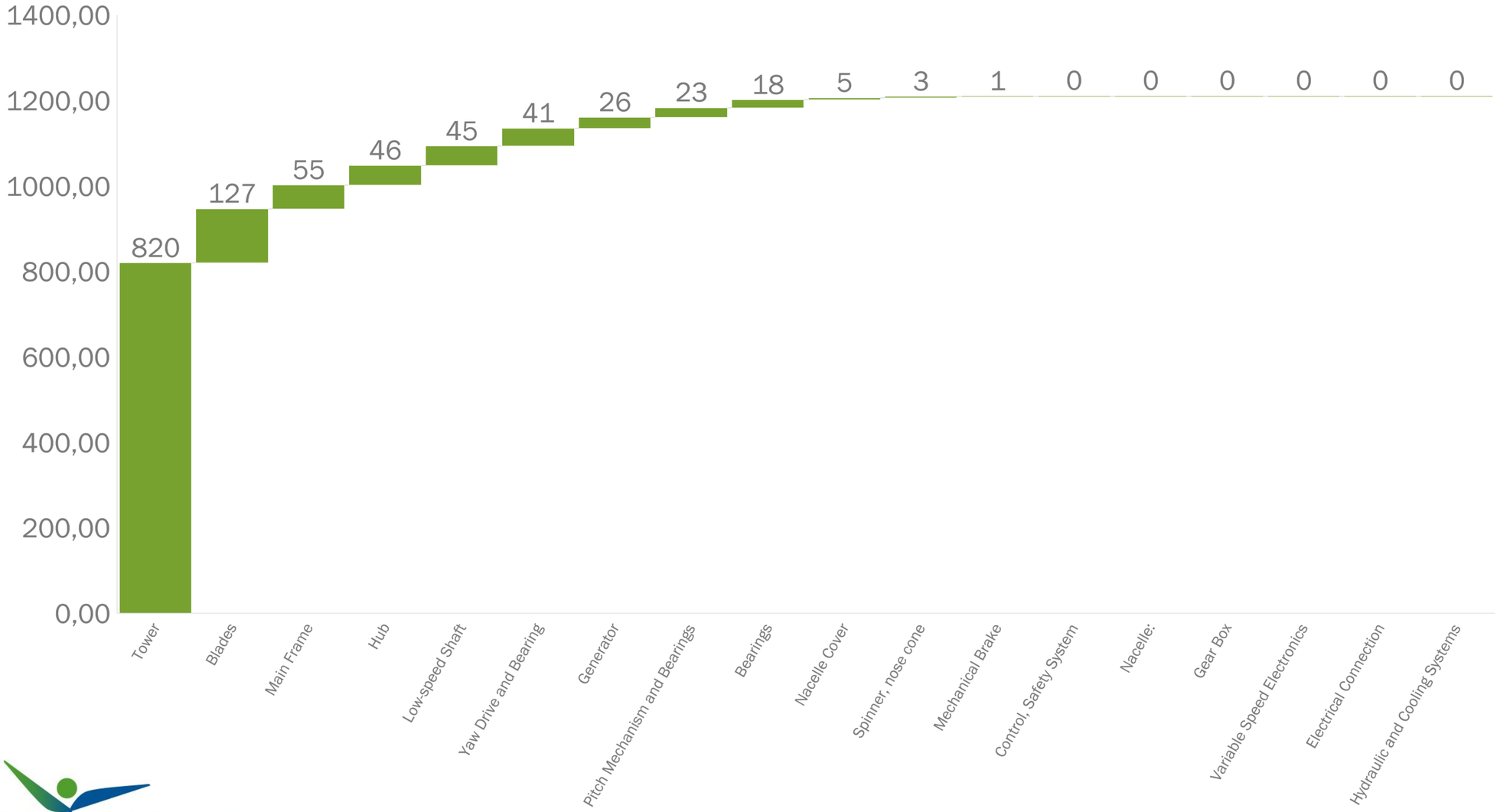
Development of wind technology

	2020-2030			2030-2040			2040-2050		
	low	medium	high	low	medium	high	low	medium	high
Wind Technology									
- Turbines									
- topology									
- rated power									
- specific power									
- size (rotor & height)									
- Manufacturing									
- capex									
- materials									
- waste rate									
- Operations									
- installation									
- services									
-maintenance									
- Decommissioning									
- dismantling									
- waste management									
- recycling									

Simulation of the mass of an offshore turbine (2010)



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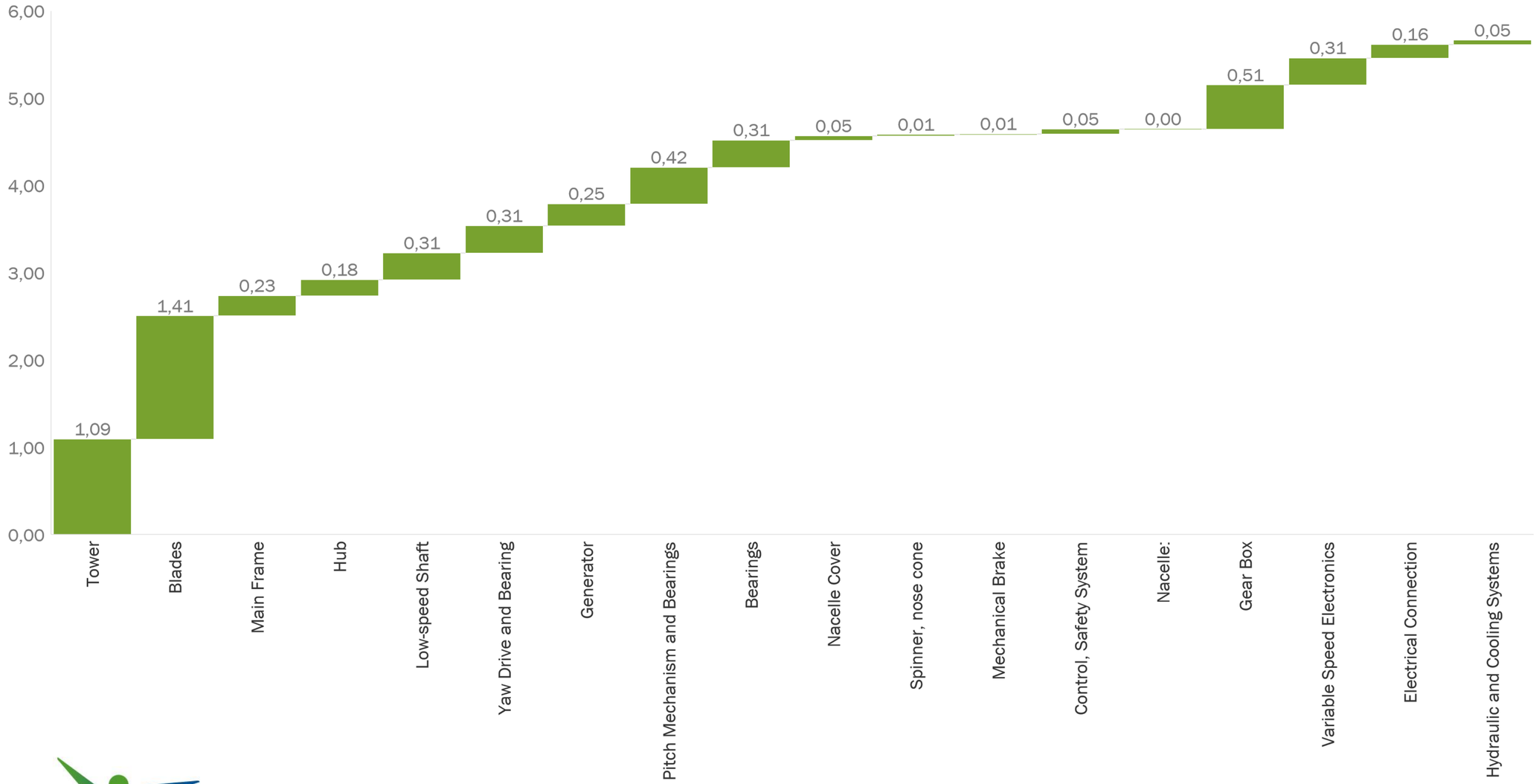
Simulation of the cost of an offshore turbine (2010)



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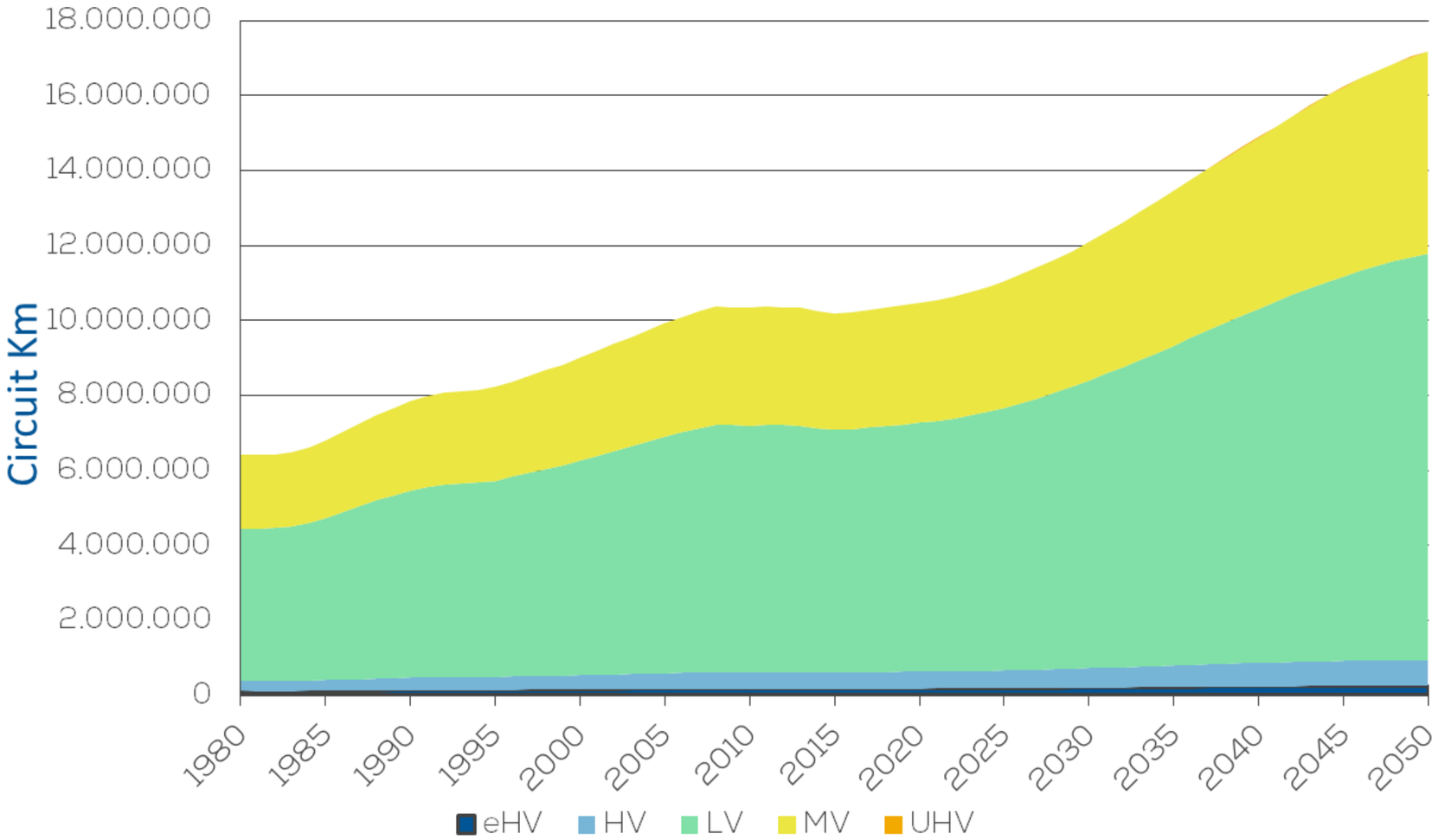
Enabling technologies to deliver climate neutrality

	2020-2030			2030-2040			2040-2050		
	low	medium	high	low	medium	high	low	medium	high
Enabling technologies									
- Infrastructure									
- grids									
- storage									
- Electrification									
- mobility									
- industry									
- heating									
- Materials									
- Digitalisation									

Enabling technologies: grid infrastructure



Source: DNV-GL for WindEurope

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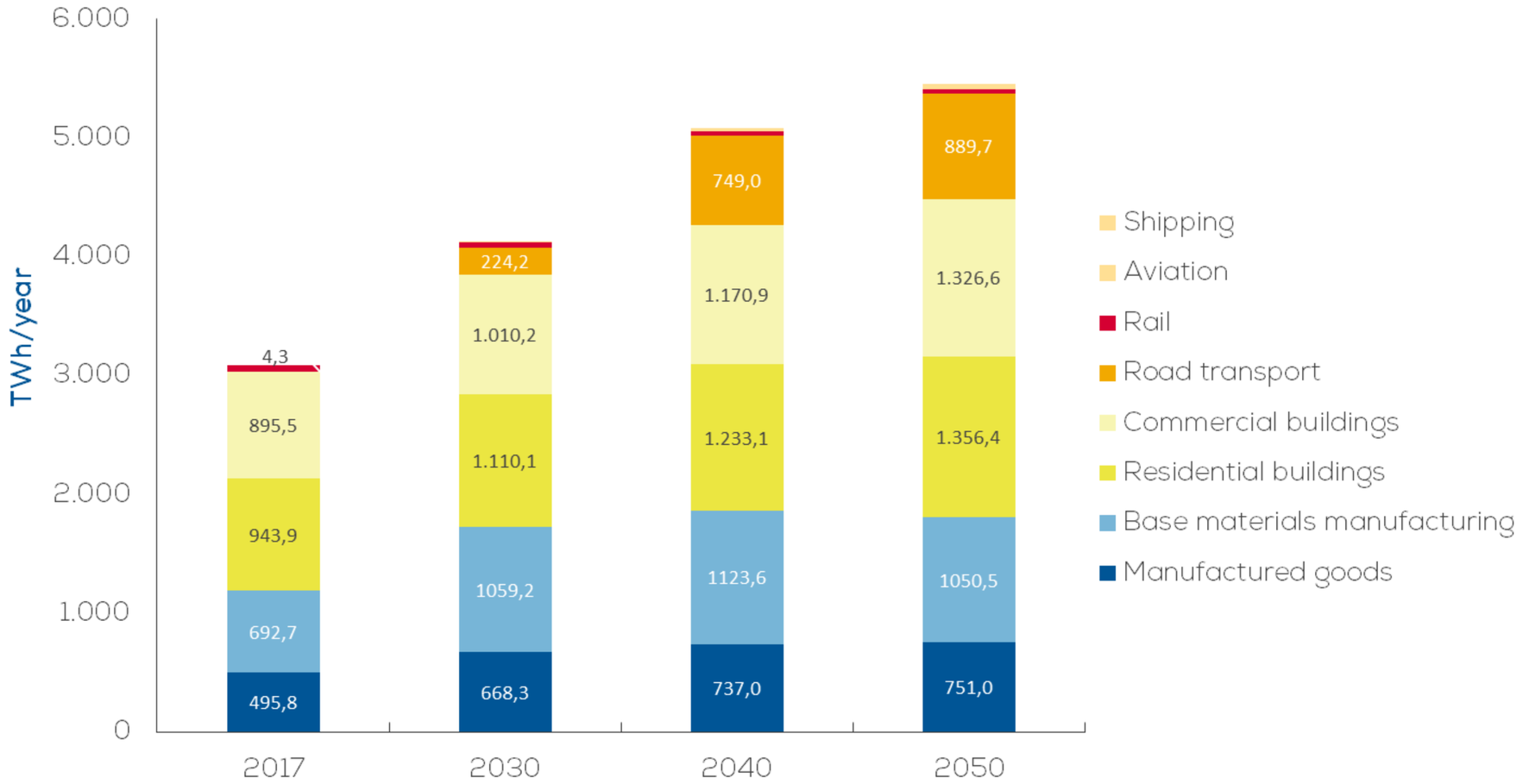
Enabling technologies: electrification

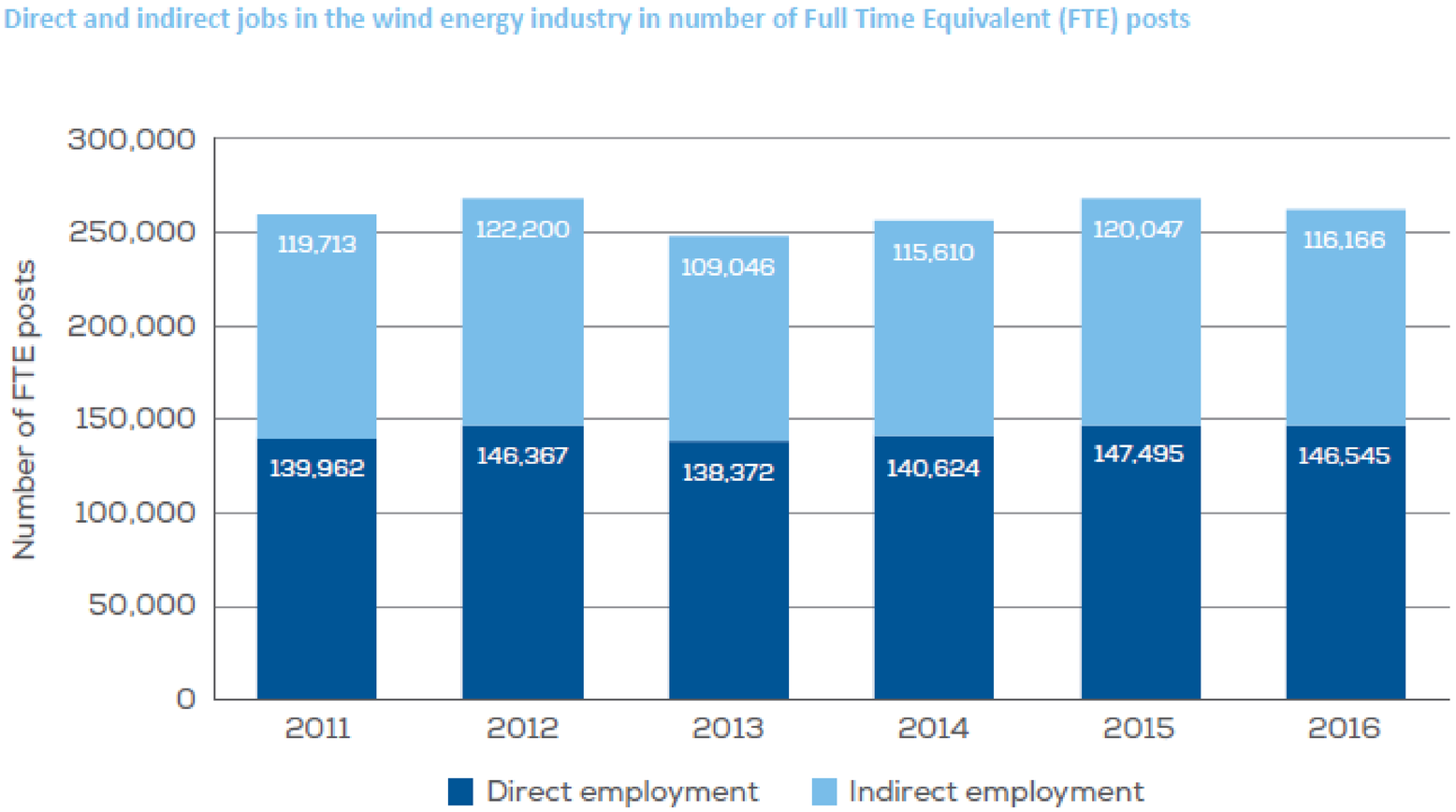


Source: DNV-GL for WindEurope

Socio-economic benefits

	2020-2030			2030-2040			2040-2050		
	low	medium	high	low	medium	high	low	medium	high
Socio-economics									
- jobs									
- revenues									
- investments									
- ghg reduction									

Socio-economics: jobs



Source: Deloitte for WindEurope

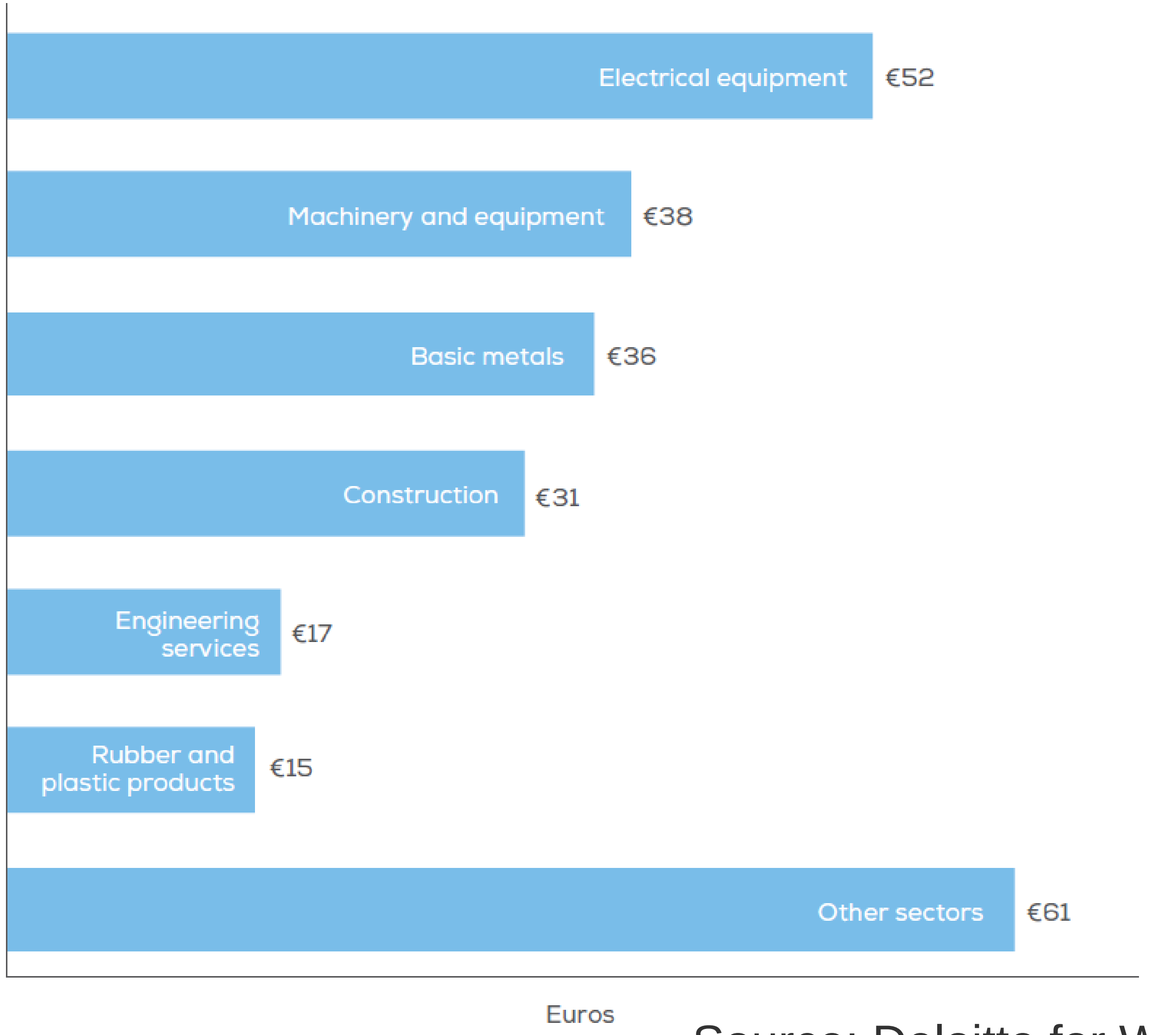
Socio-economics: revenues

Millions €	Evolution of direct impact of wind energy sector on EU's GDP (real prices; base 2010) EU Wind Energy Sector					
	2011	**2012**	**2013**	**2014**	**2015**	**2016**
Onshore wind energy developers	6,925	7,209	7,580	7,280	8,123	8,049
Offshore wind energy developers	638	906	1,163	1,767	2,254	2,432
Onshore wind turbine manufacturers	2,383	2,176	3,583	4,689	5,047	5,102
Offshore wind turbine	450	738	594	707	928	912
Components manufacturers	2,270	2,159	1,709	1,690	2,020	1,933
Services providers	3,503	3,525	3,035	2,923	2,803	2,778
Offshore wind energy infrastructures	557	960	780	1,064	1,199	1,079
Total	**16,727**	**17,672**	**18,443**	**20,120**	**22,374**	**22,285**

Source: Deloitte for WindEurope

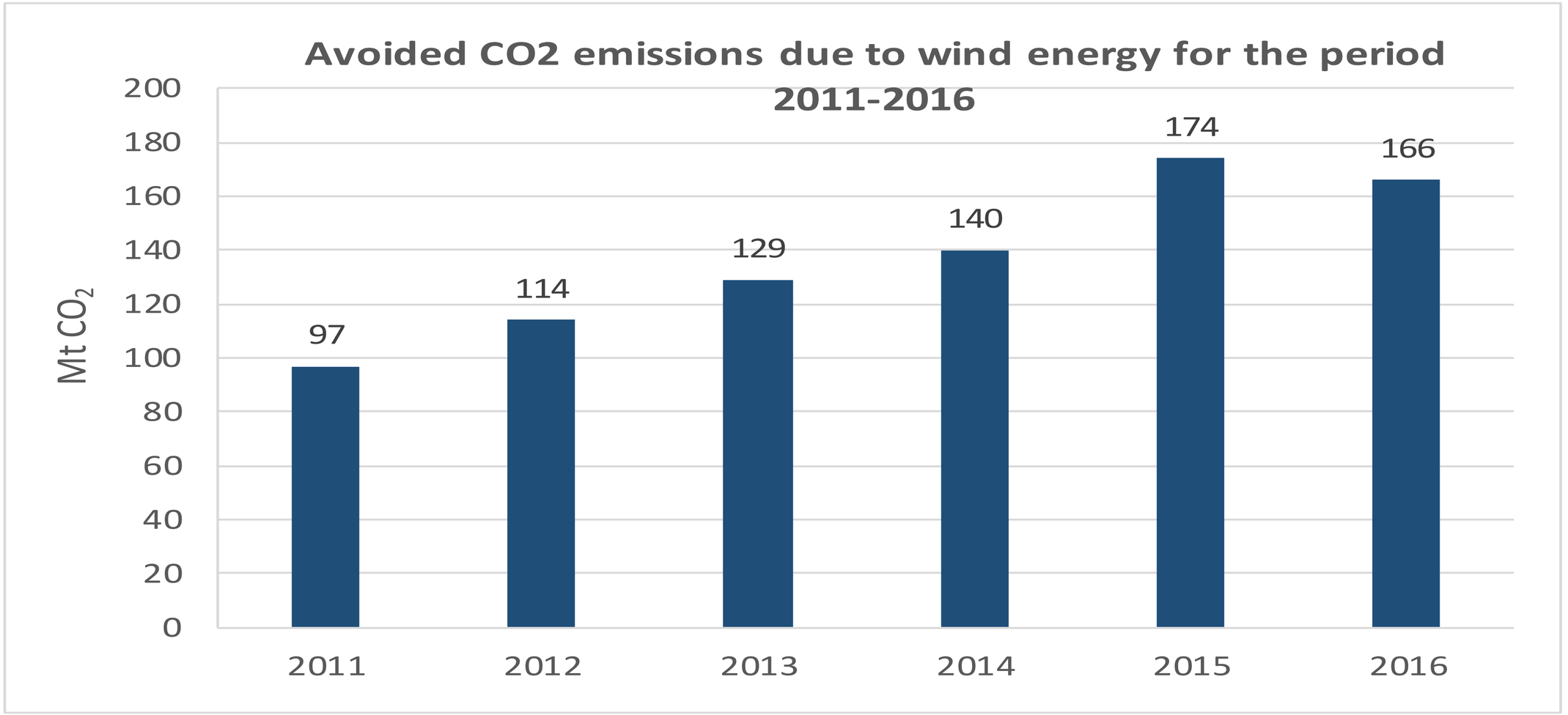
Socio-economics: indirect value added

Indirect value added to the economy by the wind industry in 2016: impact of €1,000 on the rest of the economy



Source: Deloitte for WindEurope

Socio-economics: emissions avoided



Source: Deloitte for WindEurope

European R&I policies and instruments

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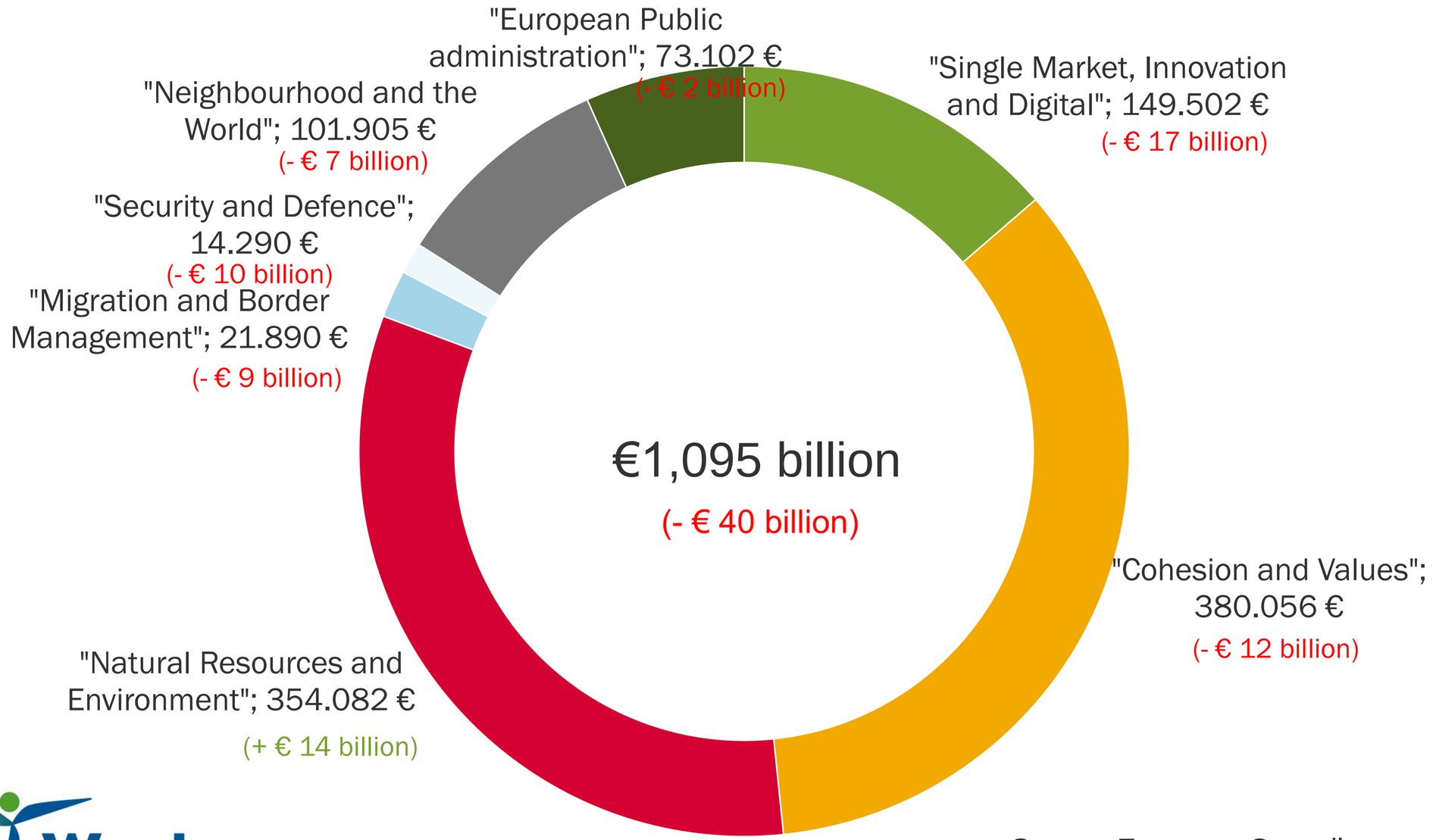
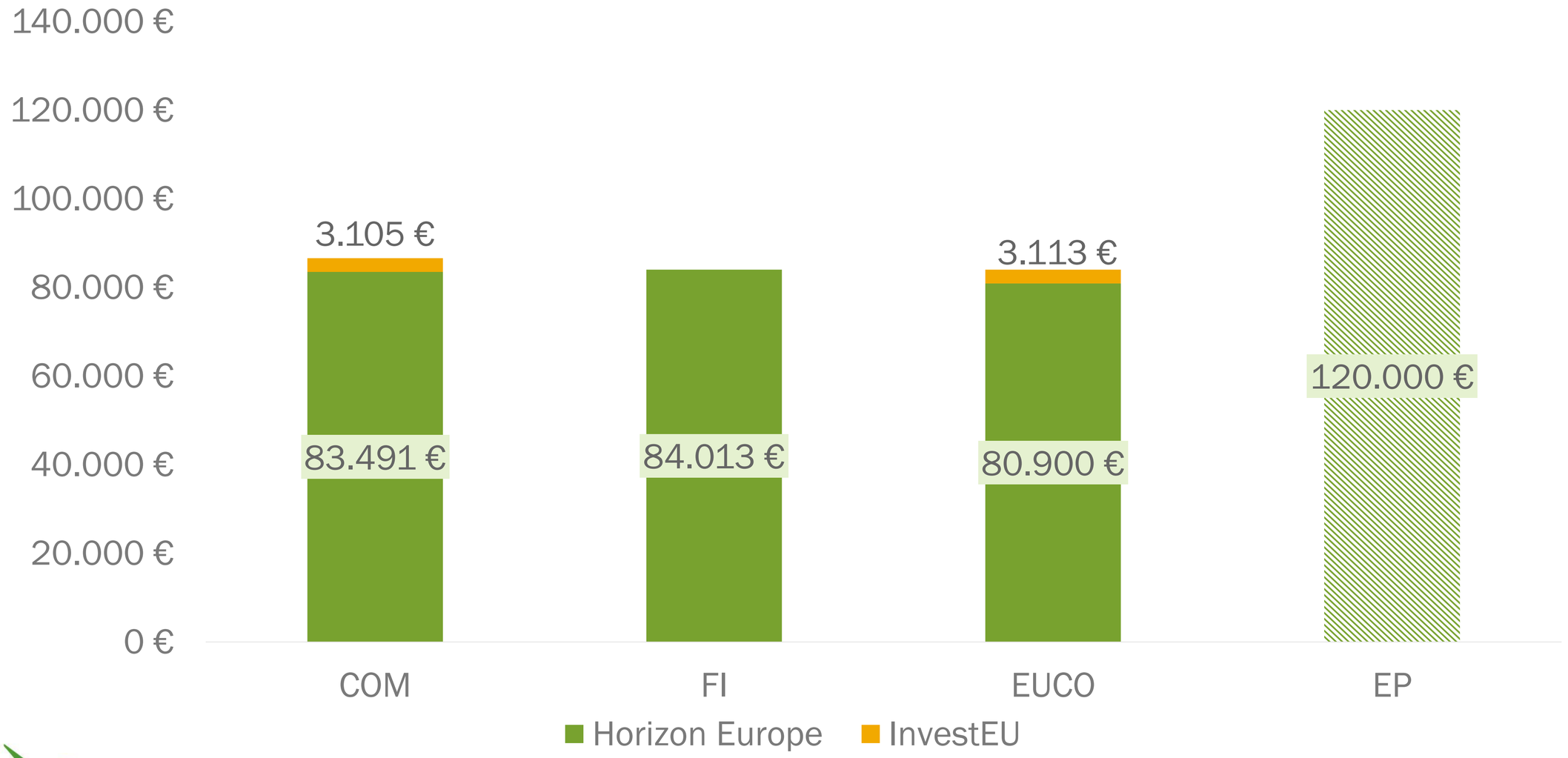
Latest proposal for EU Budget (in millions)



Source: European Council
(Numbers compared to Commission proposal)

Evolution of the Horizon Europe budget (in millions)

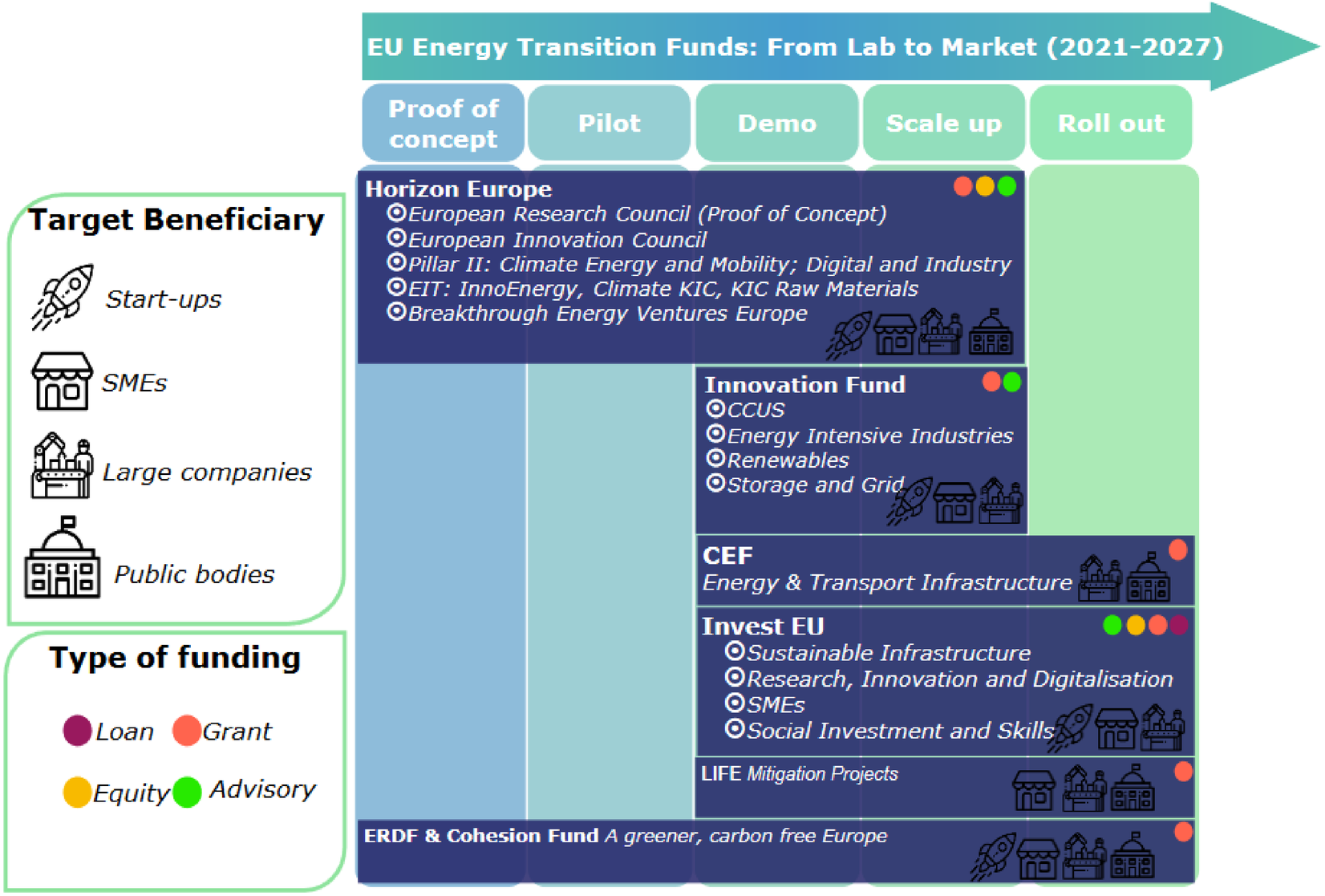


Sources: European Commission, Council of the European Union, European Parliament

Horizon Europe proposed structure

Source: European Commission

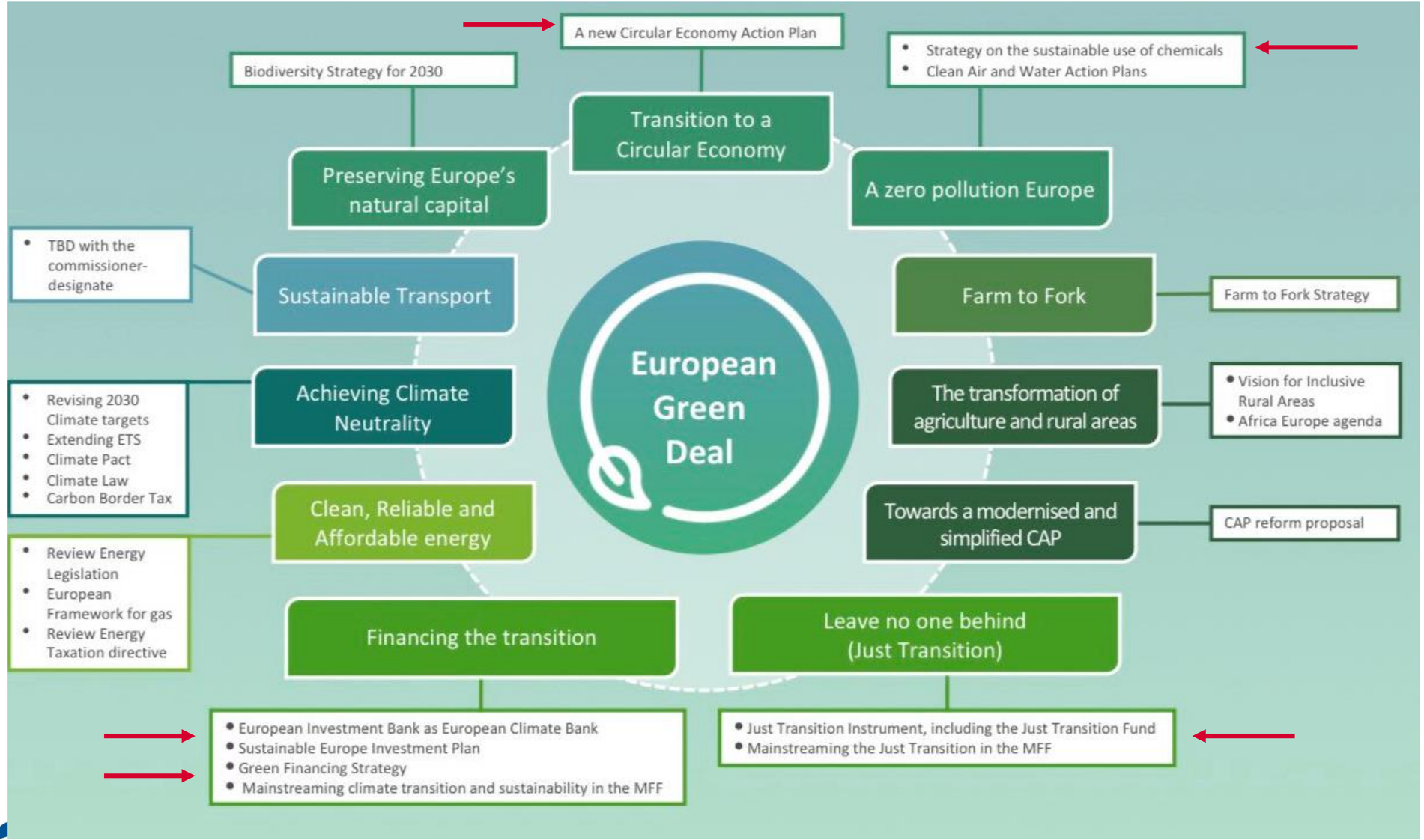
European policy outlook – EU funding landscape



Source: DG CLIMA & InnoEnergy. Information on the slide is indicative and not legally binding

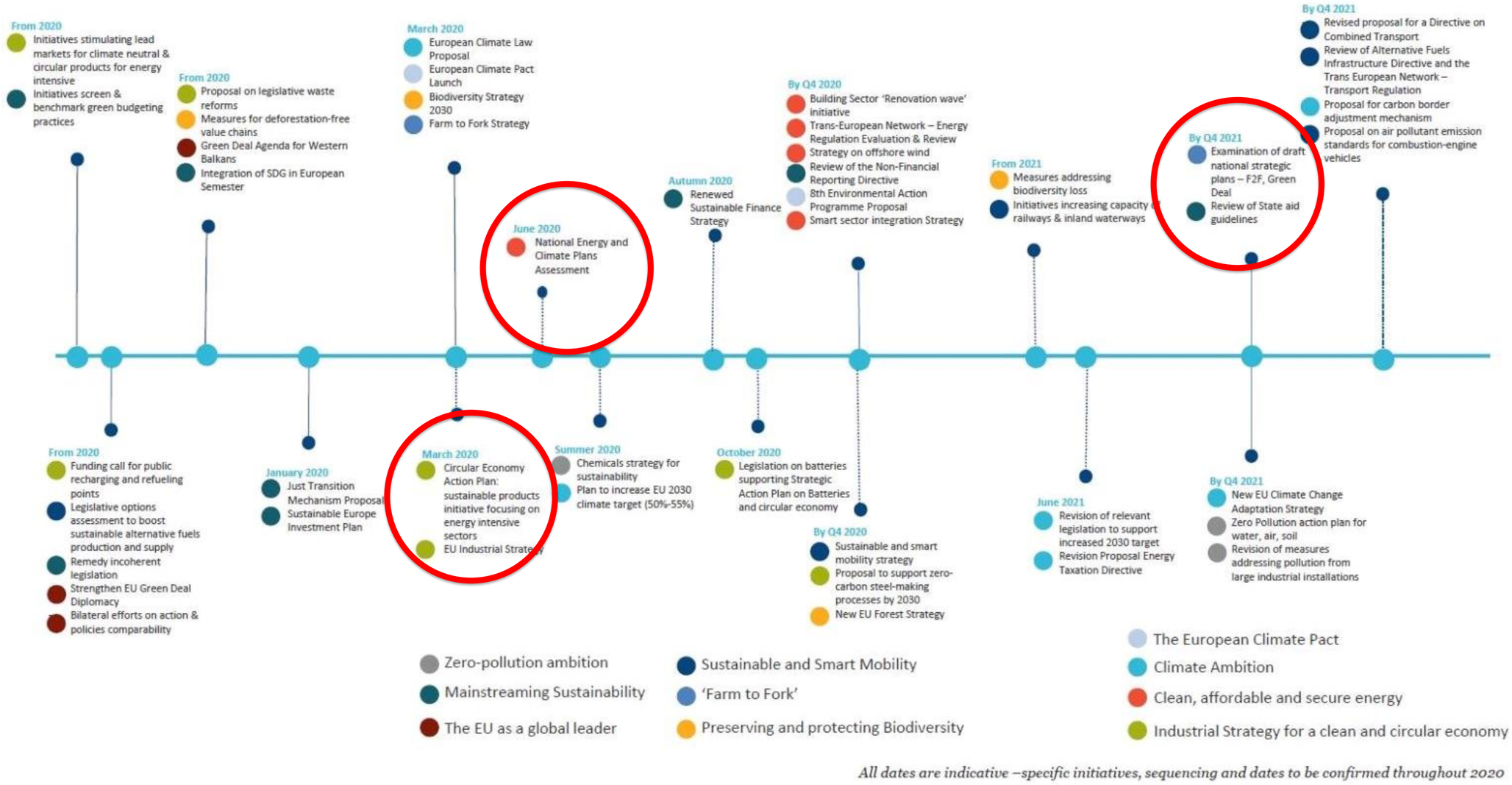
Green Deal

Towards a European Green Deal



Source: European Commission

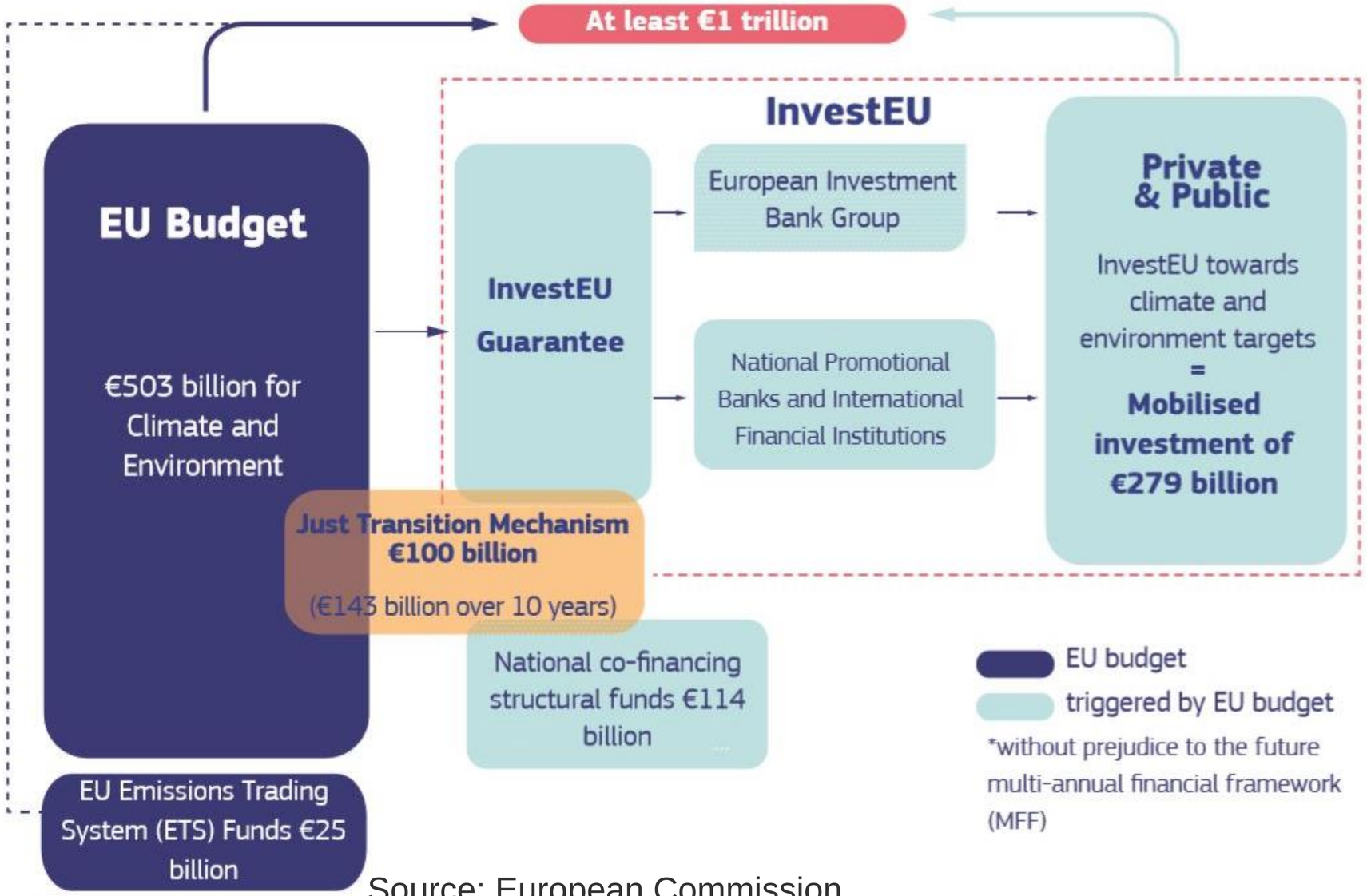
Green Deal timeline



All dates are indicative –specific initiatives, sequencing and dates to be confirmed throughout 2020

Source: FleishmanHillard

European policy outlook - Sustainable Europe Investment Plan



Source: European Commission

Fact-sheet
Floating Offshore Wind

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Objectives

- Provide overview of the state-of-play
  - Comparison of technology/commercial readiness
  - Geographic distribution

- Give recommendations on R&I funding priorities
  - Cfr. ETIPWind Roadmap

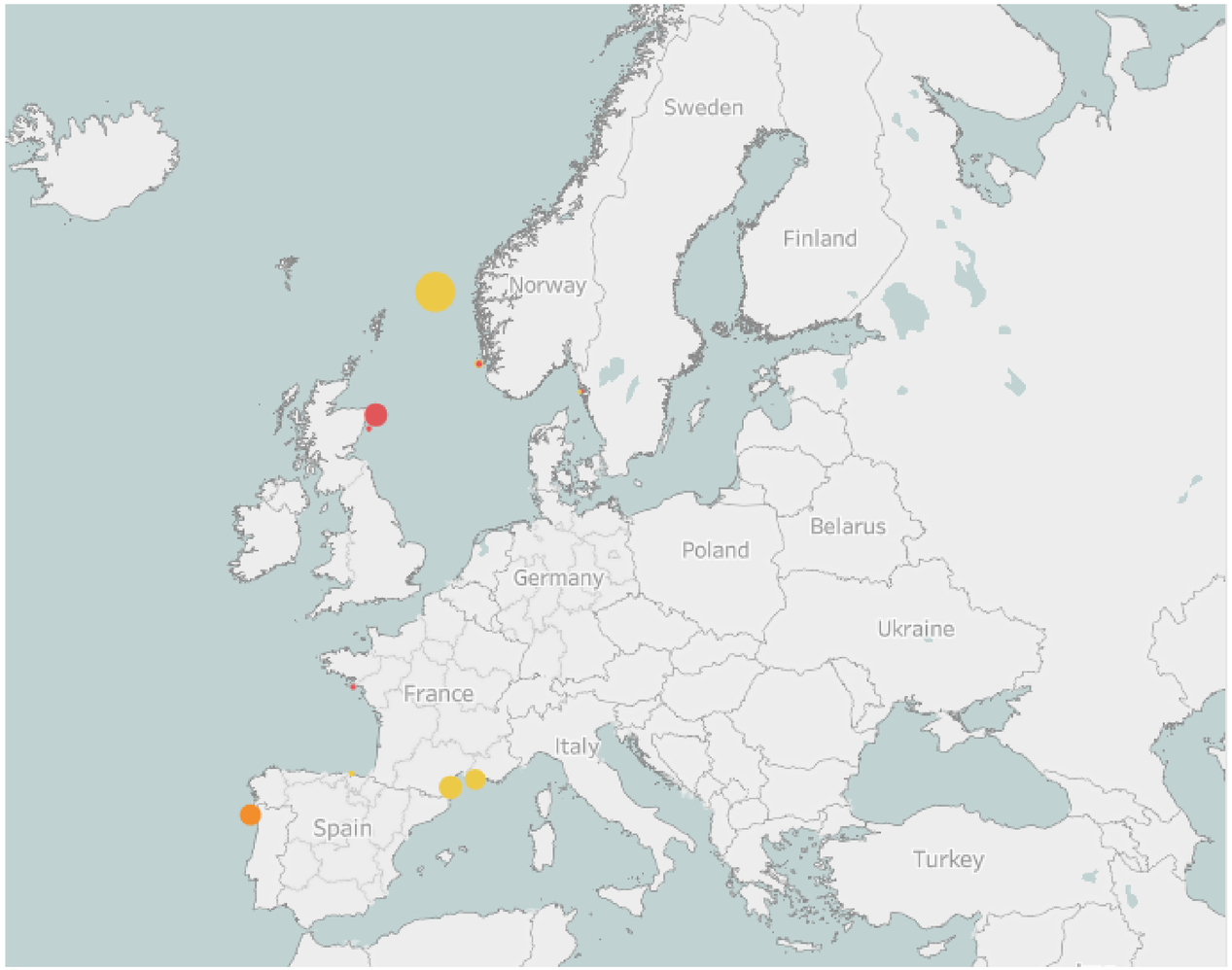
- Highlight the potential of Floating Offshore Wind
  - GW installed in Europe
  - Global export opportunities

State of technology - overview

	Manufacturer/developer	Concept Name	Country	Material	Part-scale demonstration	Full-scale demonstration	Pre-commercial deployment	Commercial deployment	Units installed and cumulative capacity (MW)	Units in pipeline and cumulative capacity (MW)
Semi-submersible	Principle Power	WindFloat	US	Steel		2011	2019	2025	2 (10.4 MW)	
	Naval Energies	Semi-submersible	France	Hybrid			2022	2025		
	Mitsubishi Heavy Industries	MHI 3 column V-shape	Japan	Steel		2016				
	Mitsui Eng. & Shipbuilding	Compact semi-sub	Japan	Steel		2013				
	GustoMSC	Tri-Floater	Netherlands	Steel		TBD				
	Aqua Ventus Maine	VolturnUS	US	Concrete		2022				
	SAIPEM	HexaFloat	Italy	Steel	2020	2022		2030		
	Nautilus	Nautilus	Spain	Hybrid		2021				
	Dolfines	TrussFloat	France	Steel			2022	2025		
	EOLINK	EOLINK	France	Hybrid		2022			1 (0.2 MW)	
	UoU, Mastek, Unison & SEHO	UOU 12-MW FOWT	South Korea	Steel	2020	2021		2025		
Barge	IDEOL	Damping Pool	France	Concrete		2018	2022	2025	2 (5 MW)	
	SAITEC	SATH	Spain	Concrete	2020	2021		2025		
Spar-Buoy	Equinor & Navantia	Hywind	Norway	Hybrid	2001	2009	2017	2024	6 (32.3 MW)	
	TODA Corporation	TODA Hybrid spar	Japan	Hybrid		2016	2021			
	JMU	Advanced Spar	Japan	Steel		2016				
	Stiesdal	TetraSpar	Denmark	Steel		2020				
	SeaTwirl Engineering	SeaTwirl	Sweden	Hybrid		2020			1 (0.3 MW)	
	ESTEYCO	TELWIND	Spain	Concrete		TBD				
TLP	SBM & IFP Energies Nouvelles	Inclined-leg TLP	France	Steel			2022			
	FloatMast	FloatMast	Greece	Steel		TBD			1 (NA)	
	GICON GmbH	GICON-SOF	Germany	Steel		TBD				
	Iberdrola	TLPWIND	Spain	Steel		TBD				
	X1WIND	X1WIND	Spain	Hybrid	2020	TBD				
Multi-platform	Pelagic & EnerOcean	W2Power	Spain	Steel				TBD		
	Hexicon	Hexicon	Sweden	Steel		2021		2025		
	FLOW Ocean	FLOW	Sweden	Steel		2021				

Source: WindEurope

State of technology - geographic distribution



Status of Floa..

- Online
- Partially online
- With permits

Total Project Capacity

- 0.30
- 20.00
- 40.00
- 60.00
- 88.00

	Projects	Capacity (MW)
FRANCE	5	113
NORWAY	3	94
UK	2	32
PORTUGAL	1	25
JAPAN	4	12
SPAIN	1	2
SWEDEN	2	1
SOUTH KOREA	1	1

Source: WindEurope

Next steps

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EUROPEAN TECHNOLOGY & INNOVATION
PLATFORM ON **WIND ENERGY**

Join the conversation
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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 826042

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