# COVID, EU Green Deal and Mediterranean Energy Market Integration

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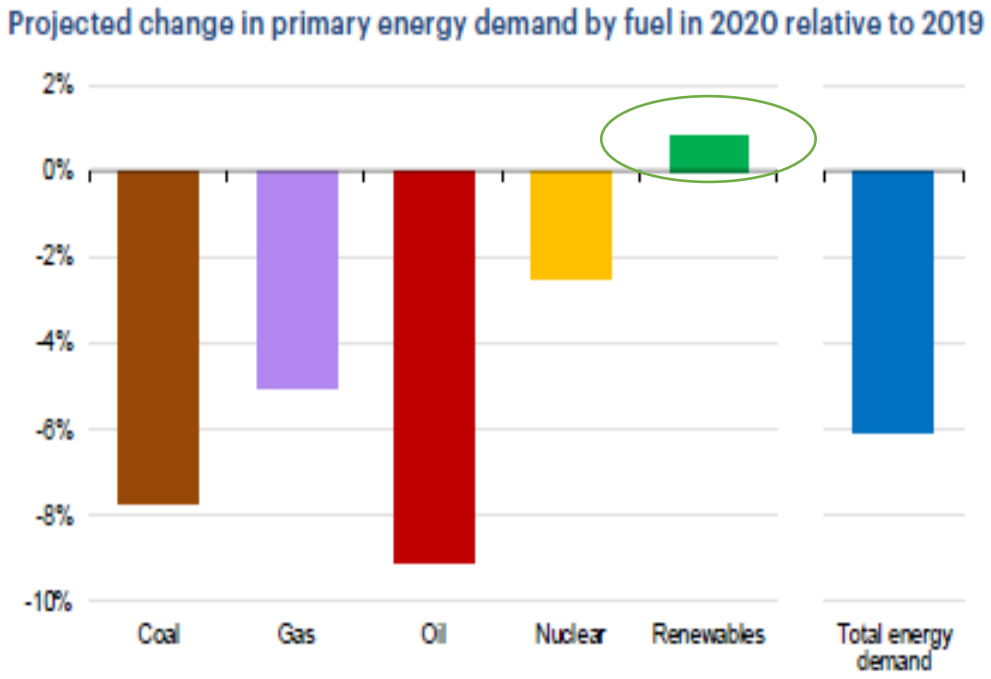
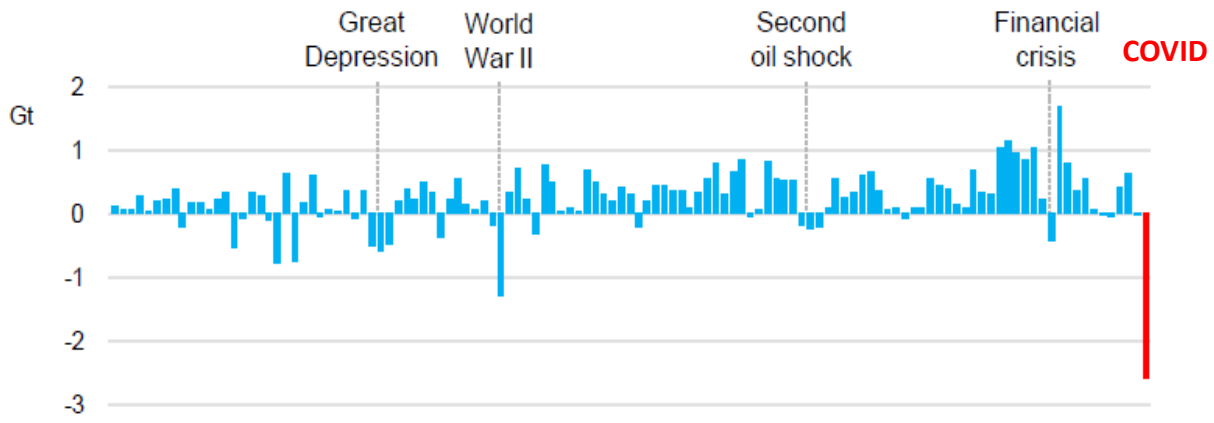
**IAEE Webinar**
**Hydrogen and Renewables: Drivers of Mediterranean Energy Market Integration Post COVID-19**
**25 June 2020**

# COVID-19: a serious crisis with some good effects




How to avoid CO2 emission rebound?

**Annual Change in energy-related CO2 emissions, 1900-2020**




Source IEA Global Energy Review 2020

# The Green Deal, the engine of the EU Recovery Plan, aims for carbon neutrality in 2050

**Interim target for 2030**:
-50/55%
More possible

The most important endeavor since the creation of the Single Market: articulating **climate, innovation and social justice**


Source: EC

**Beyond energy**:

An industrial strategy to innovate and to develop new technologies while creating new markets.

Making Europe a leader in low carbon technologies.
Hydrogen Alliance

Ensuring Europe's competitiveness:
Border Carbon Adjustments

**Beyond Europe**:

"greater emphasis on cooperation with Southern Neighborhood and work on a green agenda for the Western Balkans "

"imports of low carbon electricity and decarbonized hydrogen/ammonia from North Africa"

# The €1 850 billion EU Recovery Plan

**Next Generation EU**

a new recovery instrument of €750 billion which will boost the EU budget with new financing raised on the financial markets for 2021-2024

**A reinforced long-term budget of the EU**

for 2021-2027 (€ 1 100 billion)

**Next Generation EU** includes a new Recovery and Resilience Facility building on the European Semester and **National Energy and Climate Plans** as a basis for funded reforms.

Source: European Commission

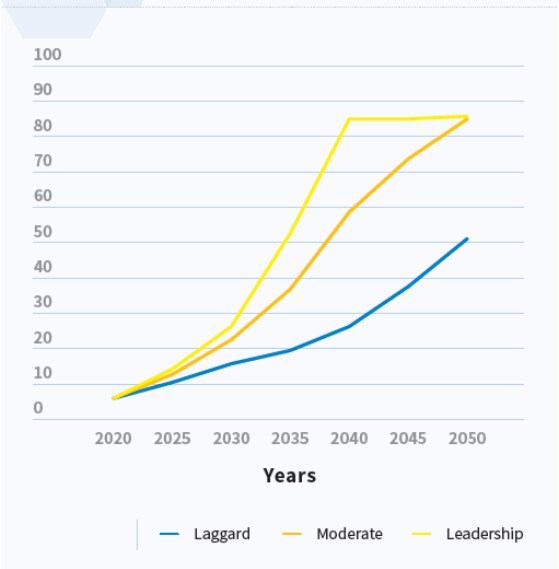
A total of €87 billion for the **Neighbourhood, Development and International Cooperation Instrument**, via a new External Action Guarantee, and the **European Fund for Sustainable Development** to support partners – in particular in the Western Balkans, the Neighbourhood and the rest of Africa – in their efforts to fight and recover from the impact of the pandemic;

# Electrification, renewable energy scale-up and hydrogen needed to reach carbon neutrality

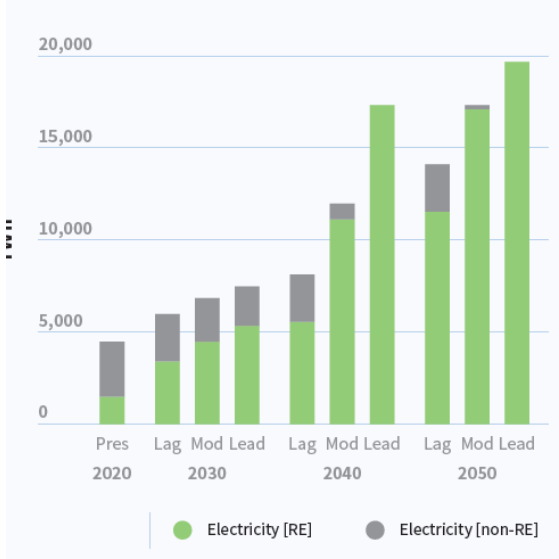
COVID19 accelerates digitalization and electrification, pinpoints the criticality of security of electricity supply

SolarPowerEurope Scenarios

| | LAGGARD | MODERATE | LEADERSHIP |
|---|---|---|---|
| RE energy share | 62% by 2050 | 100% by 2050 | 100% by 2040 |
| Paris Agreement | ⊗ | Achieved 2.0°c | Achieved 1.5°c |
| GHG emissions in the energy system | -90% in 2050 | -100% in 2050 | -100% in 2040 |
| Fossil fuels phaseout | ⊗ | Achieved in 2050 | Achieved in 2040 |
| Nuclear phaseout | ⊗ | ⊗ | Achieved in 2040 |




Electricity Share




RES in power generation

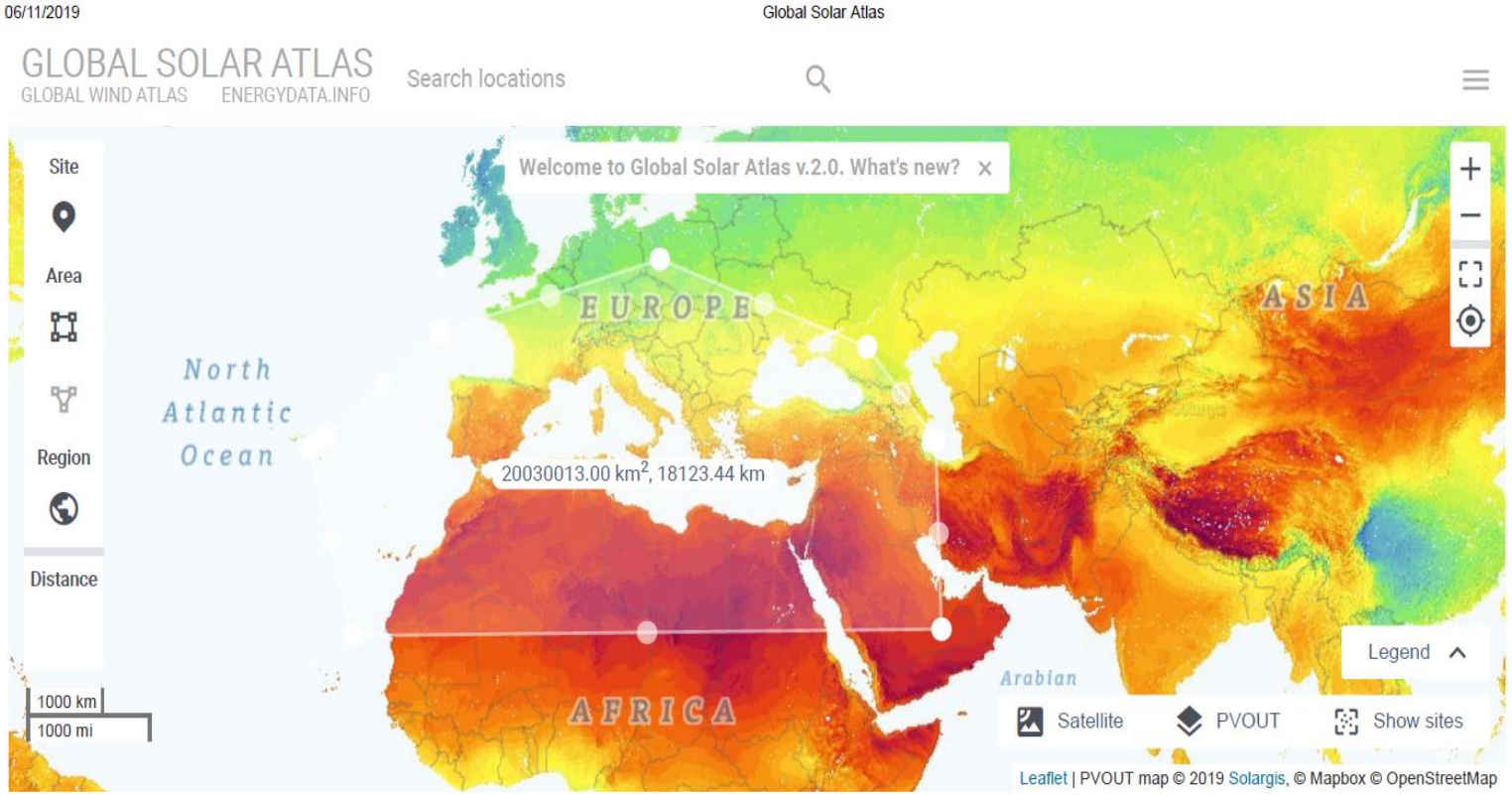
Source: SolarPowerEurope and LUT University-- See Annex for other data/sources

# Europe cannot do it alone and the Mediterranean has a role to play

Countries of the southern and eastern Mediterranean shores are rich in carbon-free energy resources and creating an integrated Euro-Mediterranean market would increase power system flexibility, thus supporting renewable energy scale-up

Key highlights of EU Green Deal are the need to increase cross-border and regional cooperation, to better share clean energy sources and to interconnect energy systems.

CE4ALL, the legislative package to implement the EU energy and climate policy over 2021-2030, includes many cooperation mechanisms, also with third countries*

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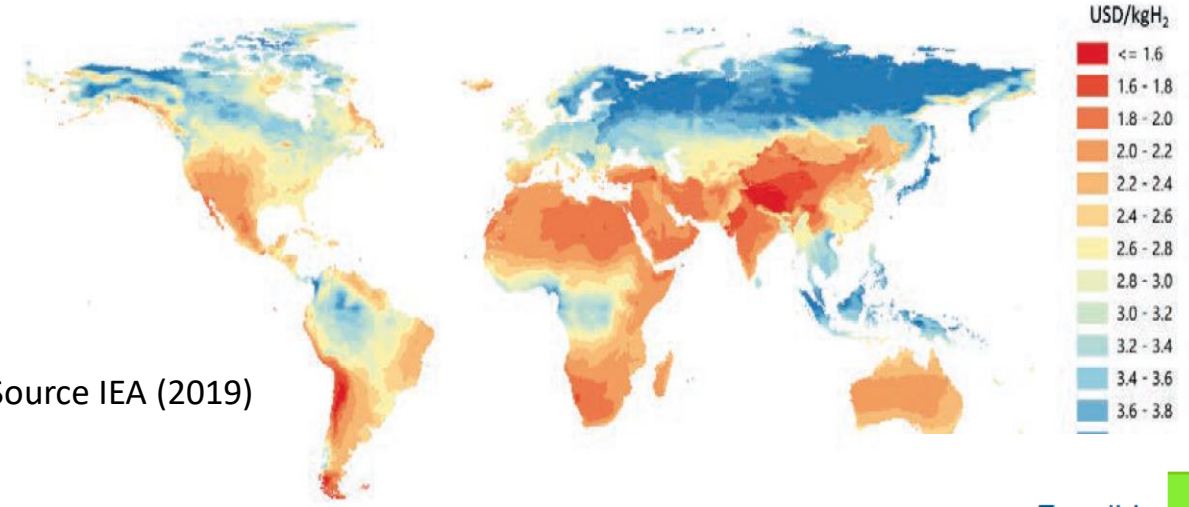
* More information in report « Clean Energy for All Europeans » Package: Implications and Opportunities for the Mediterranean.
Available on www.cmimarseille.org

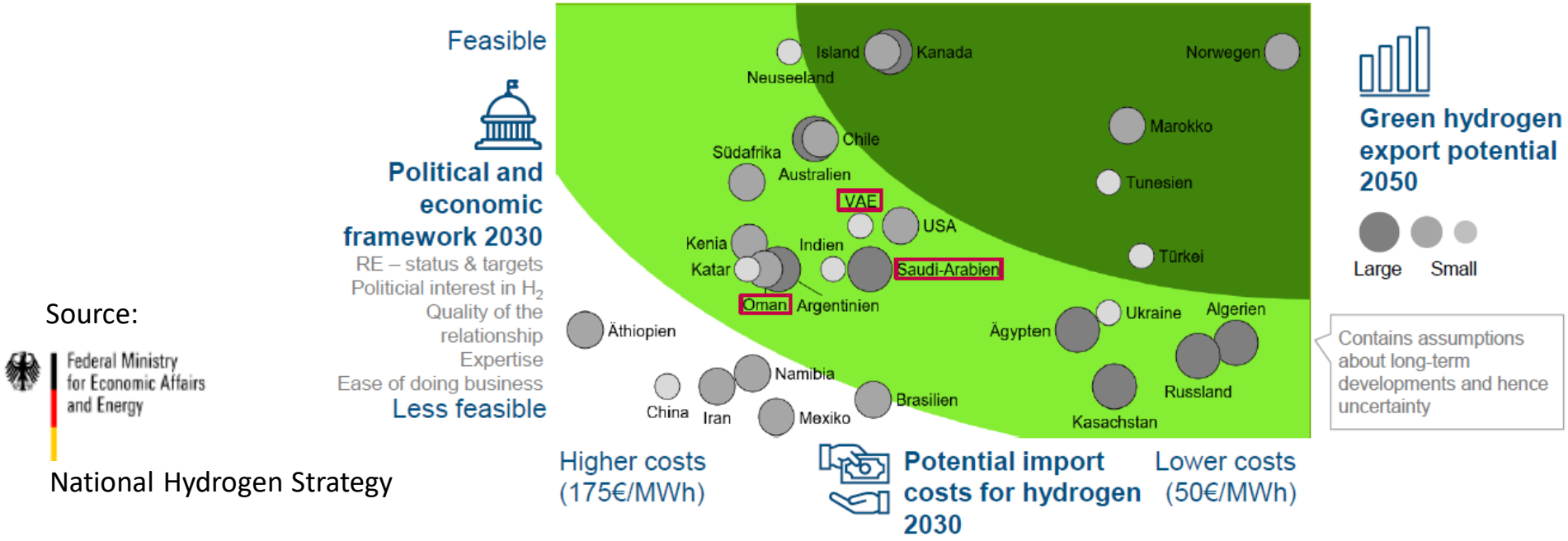
# The Mediterranean also has a role to play in hydrogen for Europe

## Green hydrogen costs




Source IEA (2019)

## Potential suppliers of hydrogen to Germany




Source:

Federal Ministry for Economic Affairs and Energy

National Hydrogen Strategy

# Mediterranean energy market integration requires infrastructure (hardware)… … and more (software)

- Electricity interconnectors
  - Morocco-Spain already connected
  - Turkey connected to Greece and Bulgaria
  - Several projects, but slow moving:
    Tunisia-Italy (ELMED PIC, TuNur)
    Algeria-Spain and Algeria-Italy
    Israel-Cyprus-Crete (PIC)
    Egypt-Cyprus-Crete

- Gas transport infrastructure underutilised, could be used for hydrogen (or blend)
  - MEG low utilisation rate
  - Medgaz empty
  - Trans-Med declining use trend to persist
  - Average utilisation of LNG terminals< 25%


- More
  - Sector Coupling, optimize across energy forms
  - Some harmonization of market design and convergence in market operations
  - Cooperation between national TSOs (and between gas and electricity SO) and National Regulatory Authorities

  **… in summary, think whole energy system and regionally/globally**

# In conclusion, think globally, think whole-system, think big, think smart….

- COVID crisis is definitely a threat to our well-being and our economies, but it may trigger some behavioral changes and policy responses that are beneficial for the climate. Solidarity and cooperation are needed to succeed.

- The EU Recovery Plan can have a transformational effect on energy systems in Europe, and beyond. The EU is supporting SEMC to recover from the COVID crisis, SEMC can help EU reach its carbon neutrality objective.

- The hydrogen revolution is under way and the Mediterranean will be center stage. The region has the resources and the infrastructure to be one of the key players.

- Complexity increases, as decentralized generation coexists with large facilities serving multiple national markets, and firm generation decreases. Coordination is required for planning and operations management at different levels

  => management of massive amount of information in real time (AI, blockchain, etc.)

# Thank you for your attention

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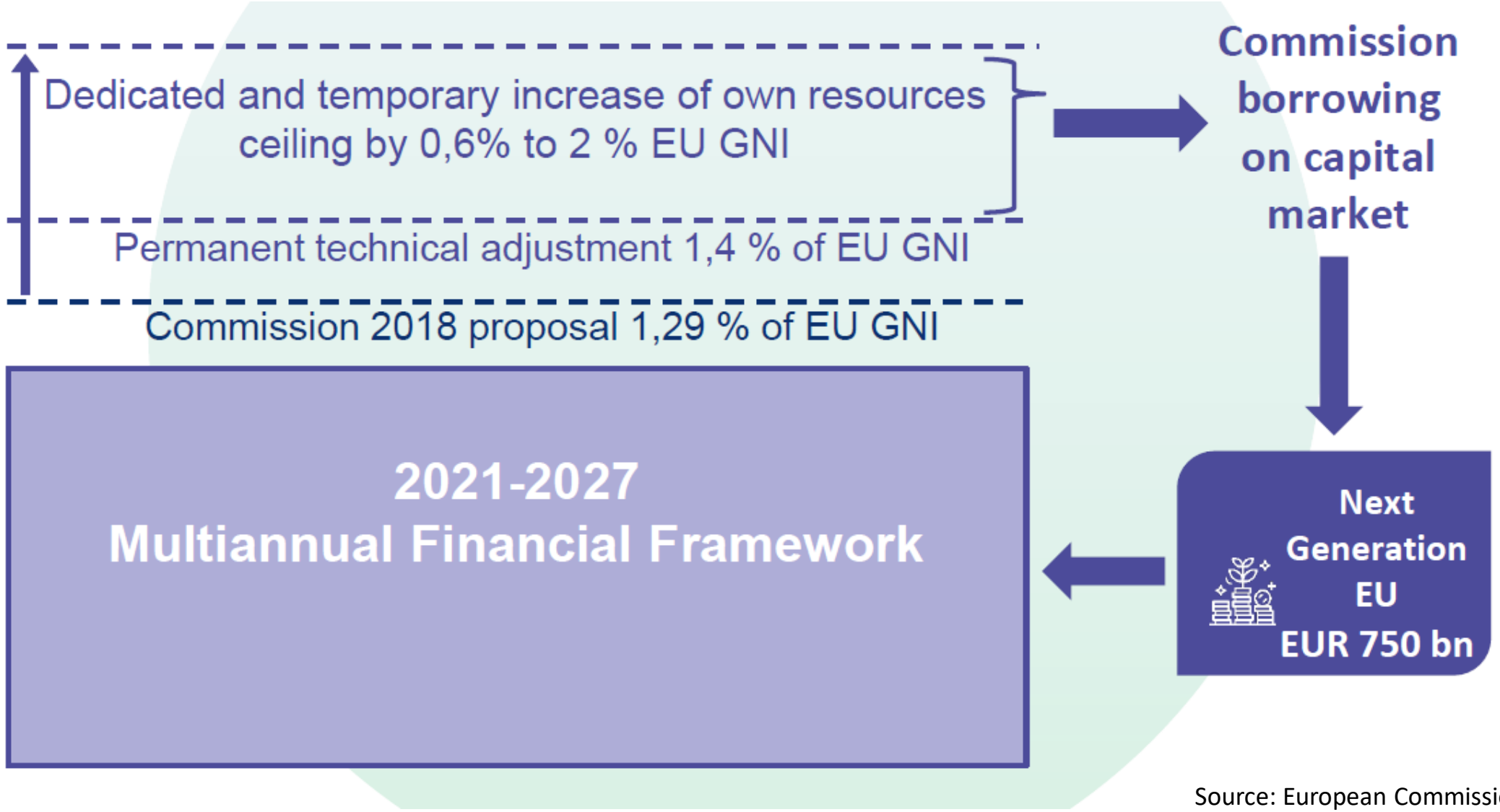
# Back-up Slides

# EU Recovery Plan: How does it work?




Source: European Commission

# The EU Recovery Plan- Timeline

**May 2020**

Commission proposal for the Revised Multiannual Financial Framework 2014-2020 and 2021-2027 and Own Resources Decision, and sectoral legislation

**by July 2020**

European Council: Political agreement on Multiannual Financial Framework 2014-2020 and 2021-2027 and Own Resources Decision

**by summer 2020**

European Parliament's consultation on Own Resources Decision

**early autumn 2020**

Adoption of the revised Multiannual Financial Framework 2014-2020 and corresponding sectoral legislation

**October 2020**

European Council

**December 2020**

Adoption of the revised Multiannual Financial Framework 2021-2027 (European Parliament's consent); Adoption of the Own Resources Decision (Ratification by all Member States in line with their constitutional requirements)

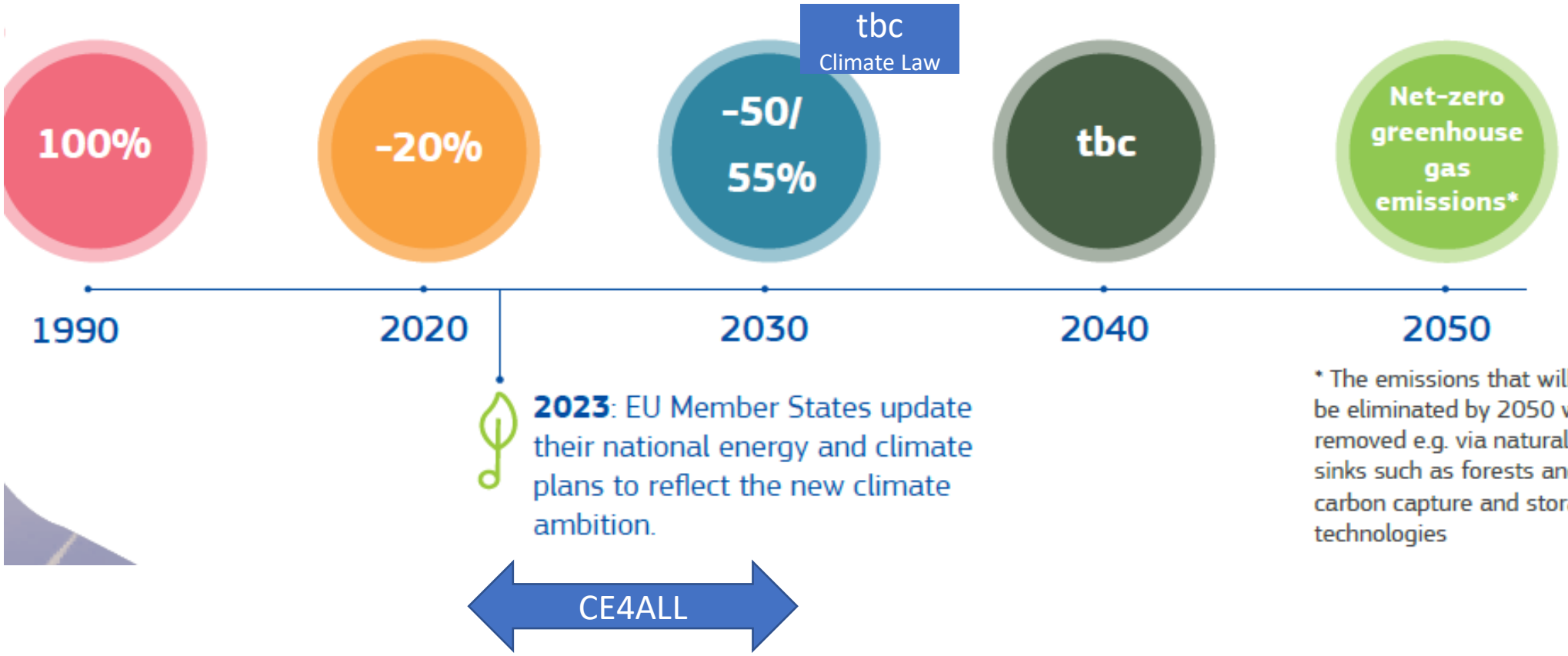
**January 2021**

Multiannual Financial Framework 2021-2027 implementation starts

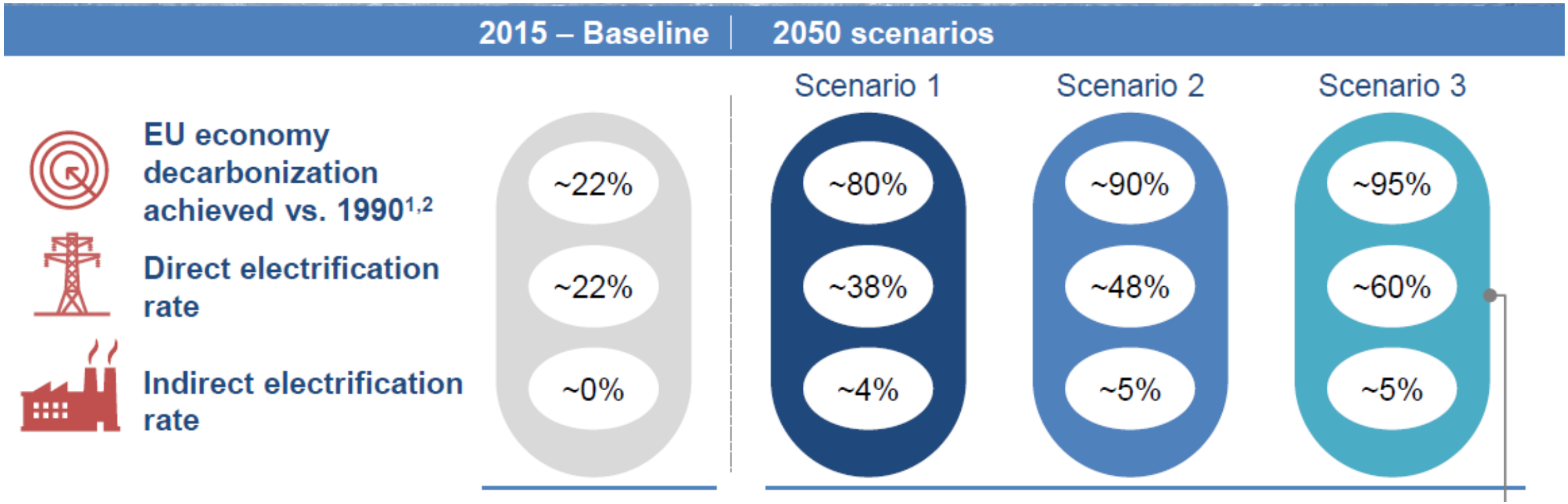
Source: European Commission

# The European Commission will make proposals to increase the EU's climate ambition for 2030.

Relevant energy legislation will be reviewed and where necessary revised by June 2021. EU Member States will then update their national energy and climate plans in 2023, to reflect the new climate ambition.

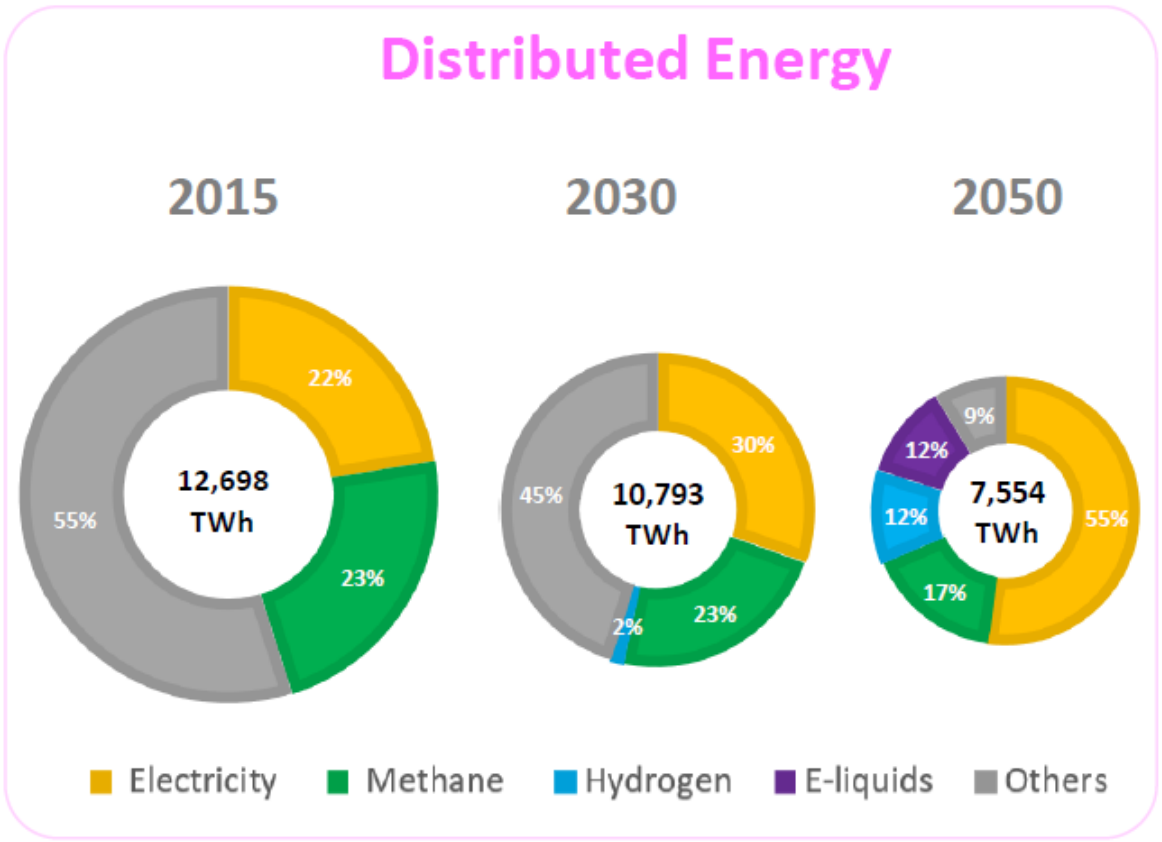


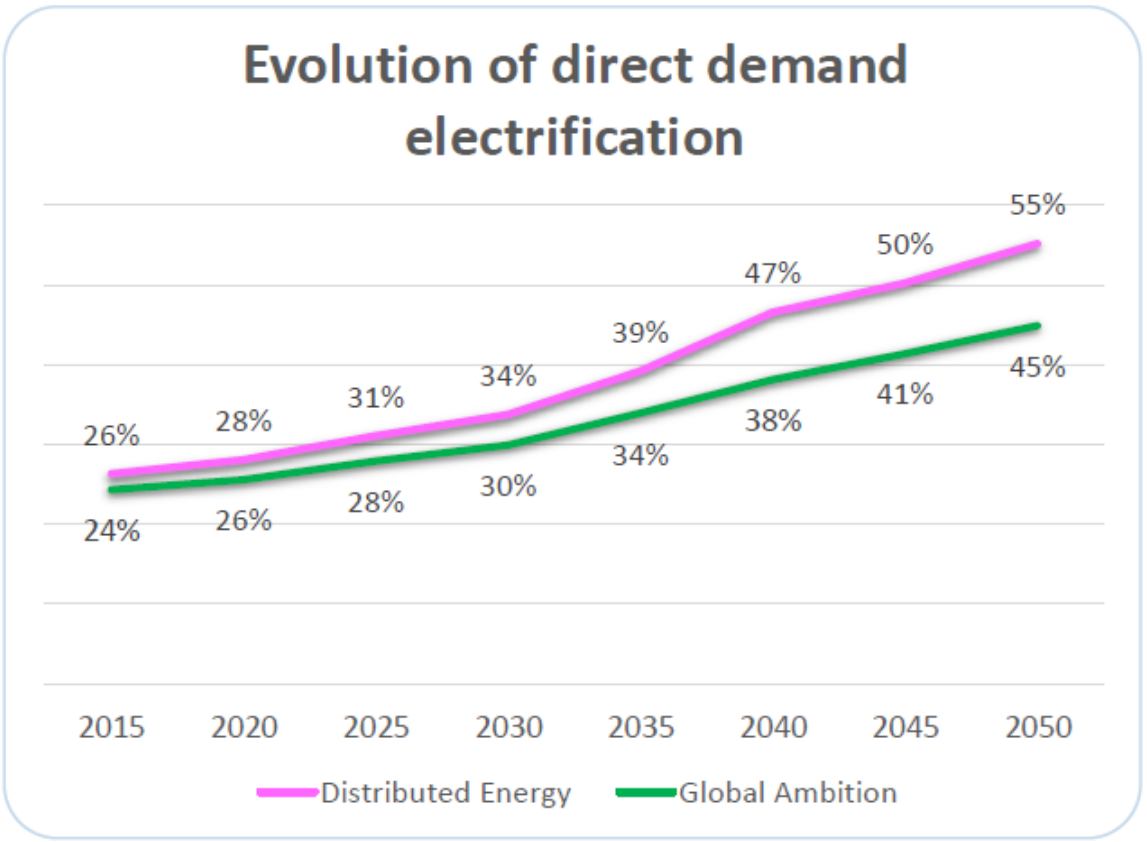

Source: EC




Source: Eurelectric

# The role of electrification




Source:ENTSO-E

# POWER SYSTEM FLEXIBILITY

Numerous definitions but flexibility can generally be defined as the ability of the power system to cope with sudden and unexpected changes in demand/supply

**Dispatchable power plants**

Gas-fired power plant

**Demand side Response**


**Energy storage facilities**

Pumped hydro facility

**Interconnection with adjacent markets**


Scandinavian interconnections

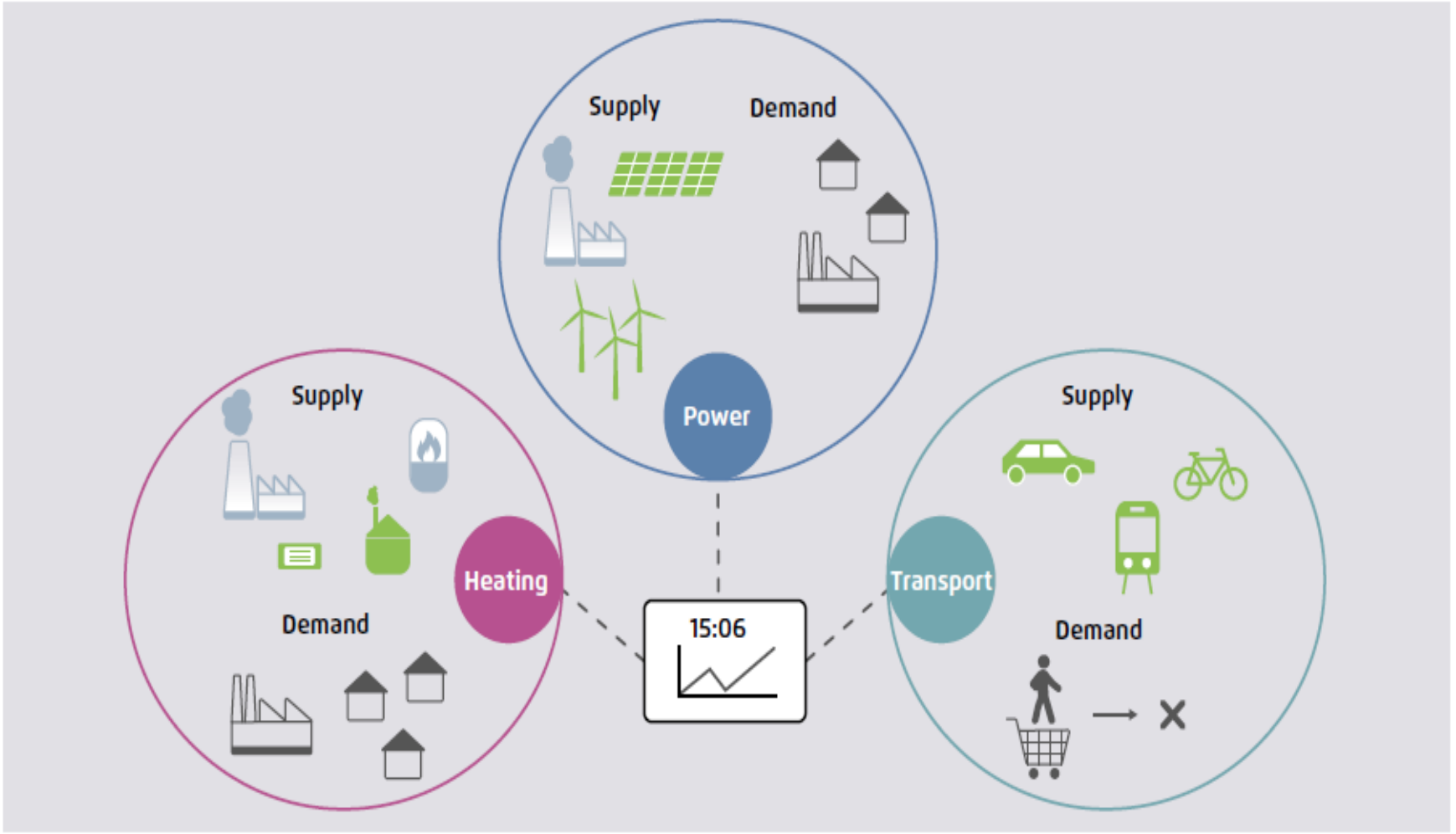
# Sector coupling, also a source of flexibility (DSR, storage)

- Concept initiated with the coupling of the transport sector with the power sector: use electric vehicles (EV) as batteries and let power flow from EV to the grid (V2G)– since cars are parked 95% of the time

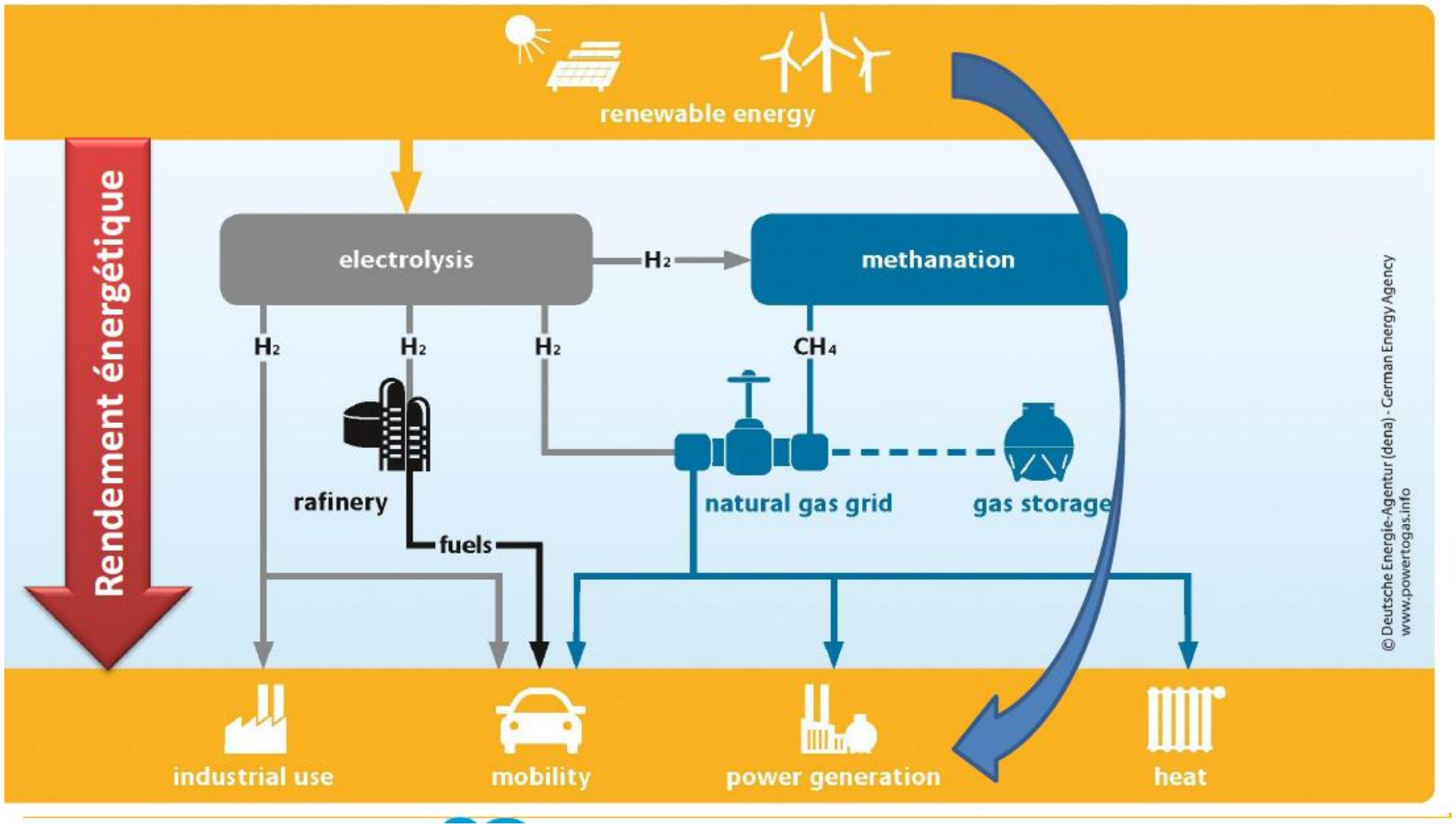
- Massive electrification of end-use sectors create new loads high in capacity but low in energy, if not properly managed. But if end-use sectors are coupled with each other and with power sector, DSR potential and storage solutions are increased

- Integration of electricity and gas (incl green gas and hydrogen) sectors is also a source of flexibility

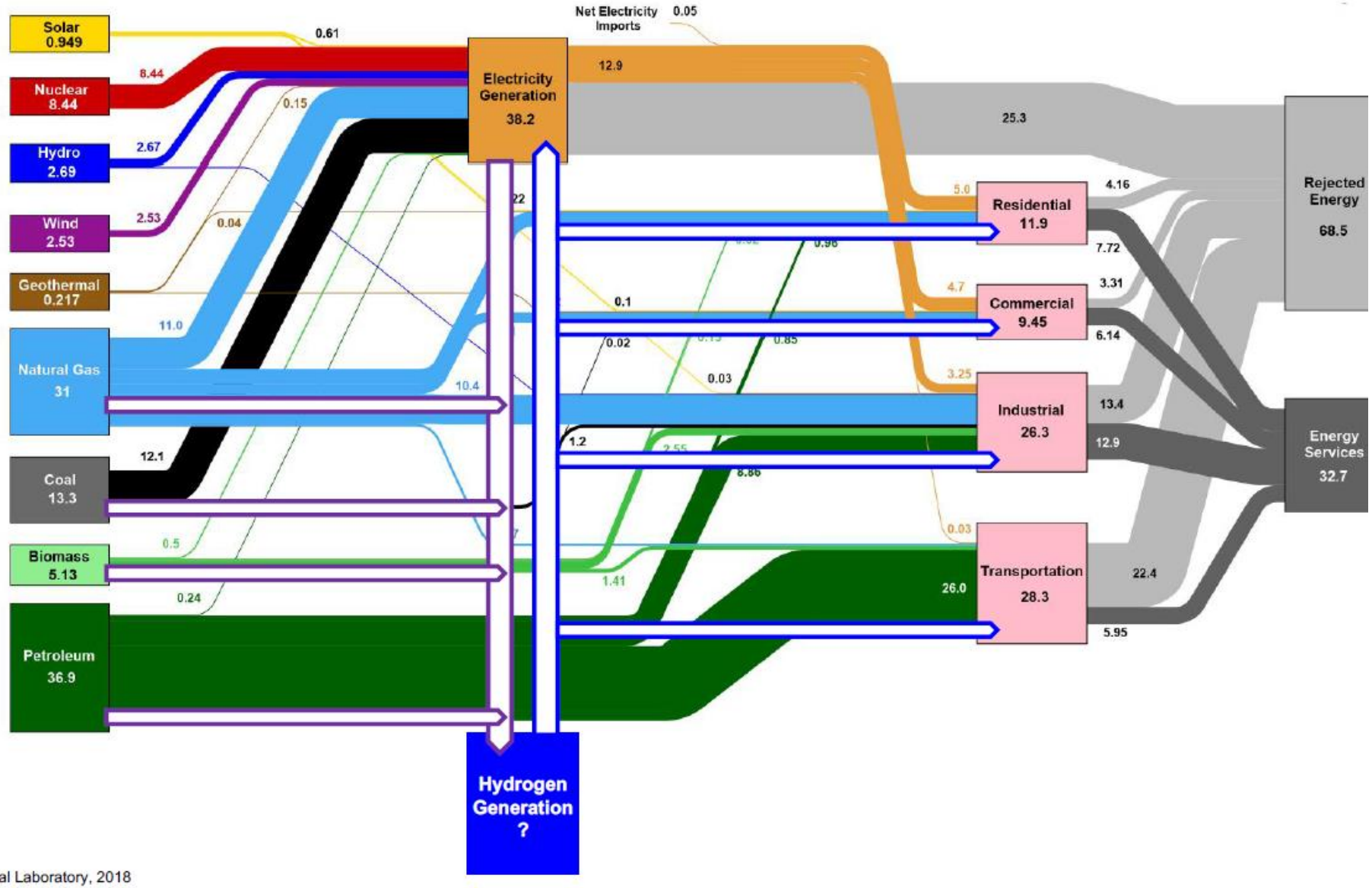
# Sector coupling



# Power-to-Gas – Gas-to-Power



# Hydrogen is not a primary energy source




Sources: Lawrence Livermore National Laboratory, 2018