Energy Union and the Integrated SET Plan

European Commission

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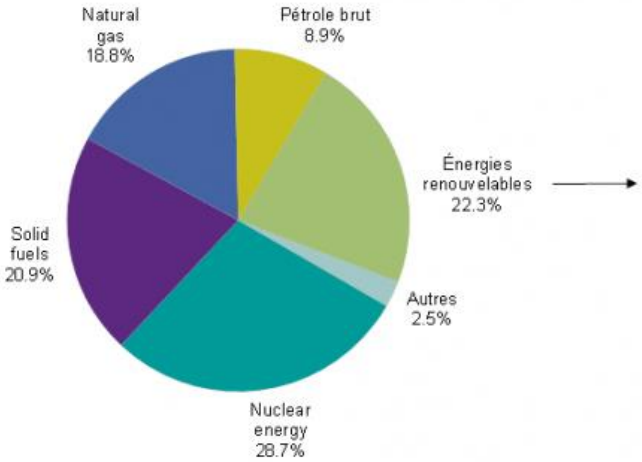
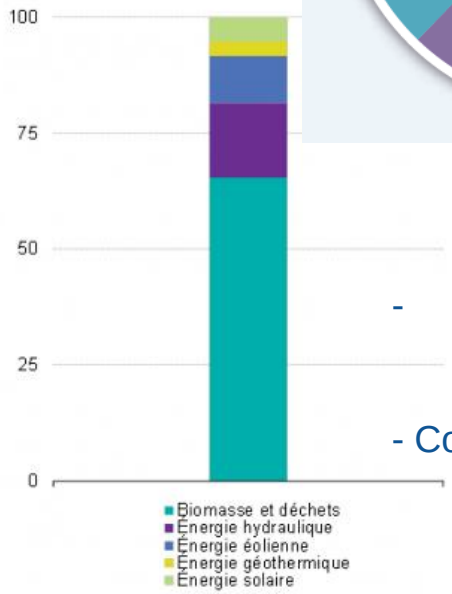
The European Union Energy System

Key figures

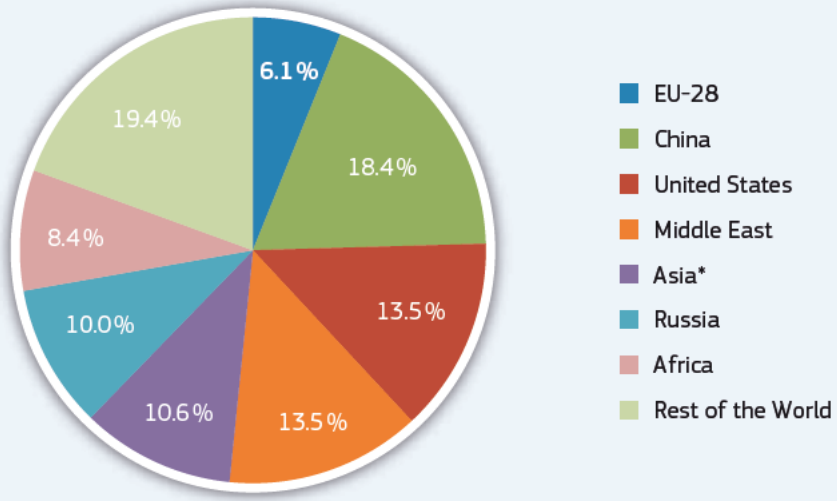
Production and imports (2014)





World Energy Production by Region (%)

Total 2011 = 13 202 Mtoe



- Still a strong reliance on hydrocarbon

- Continuously increasing share of RES

The European Union Energy System (ii)

Diverse and fragmented

+ 2015: 28 Member States

+ EU legal framework but national regulations

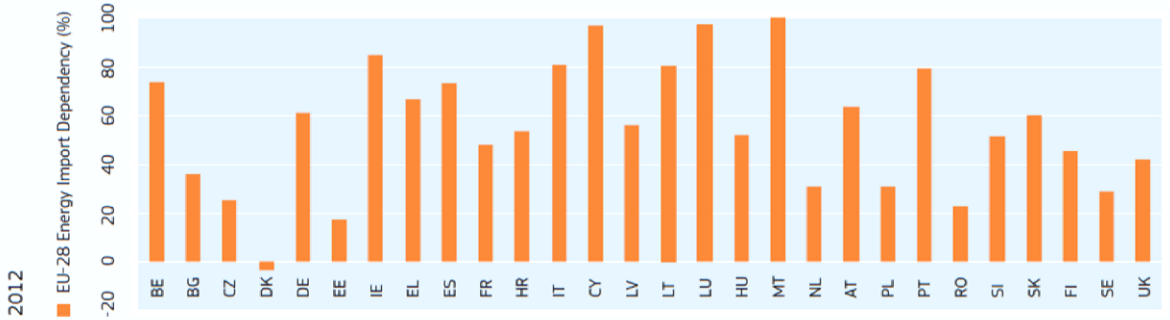
+ Different energy production sources

+ Different histories, INCO relationship, sources of imports and dependencies

+ Different political priorities (green, shale gas, etc.)

+ Liberalisation makes good but unequal progress

+ Missing corridors between countries



Major energy challenges in Europe

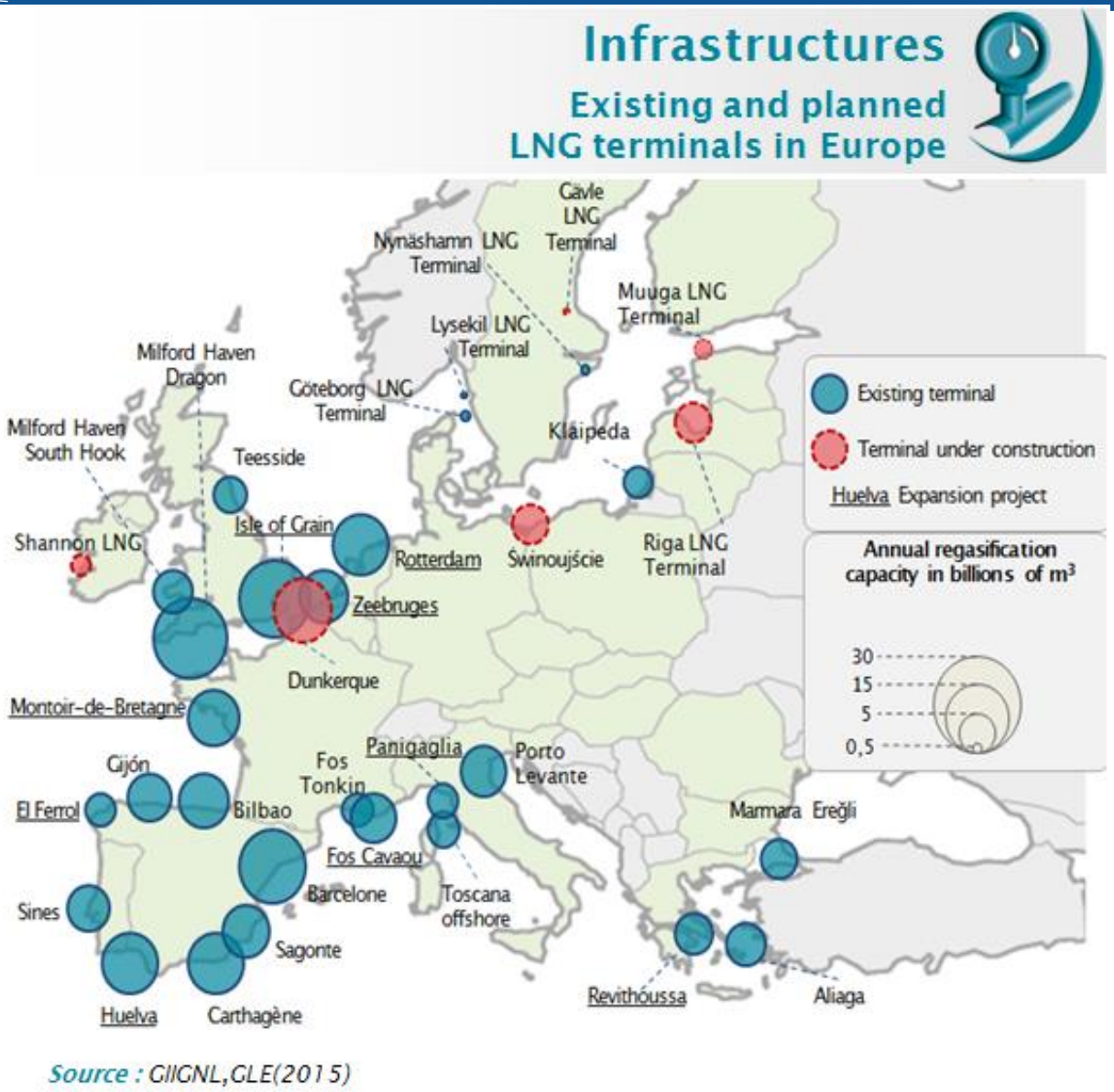
European Commission

Import dependency

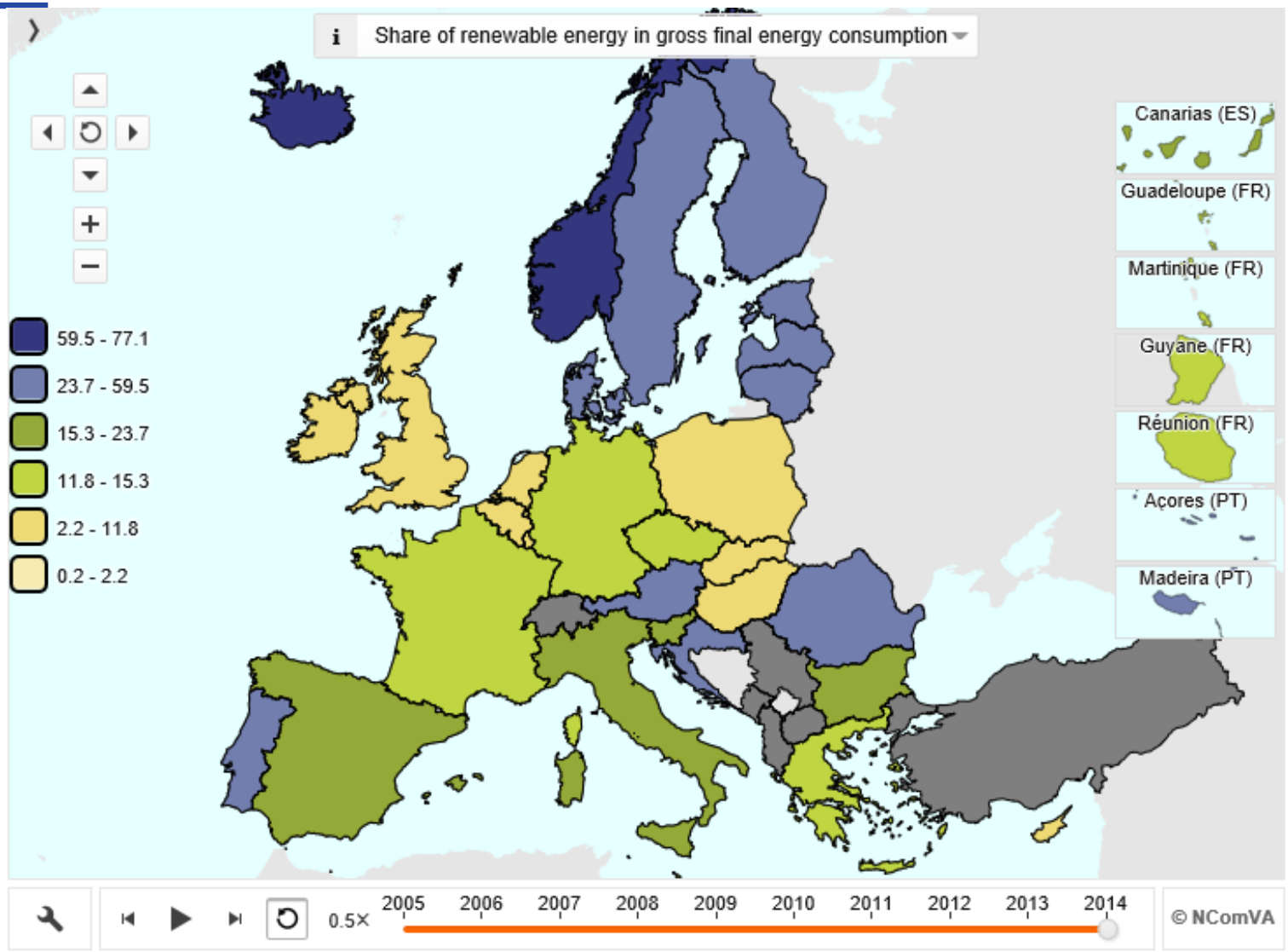
(*) Net imports divided by the sum of gross inland energy consumption plus bunkers, expressed as a percentage. EU-28: 2002 and 2013. Non-EU G20 members: 2002 and 2012.
Source: Eurostat (online data code: tsdcc310) and the International Energy Agency (Balances)

Major energy challenges in Europe (ii) Import dependency

European Commission

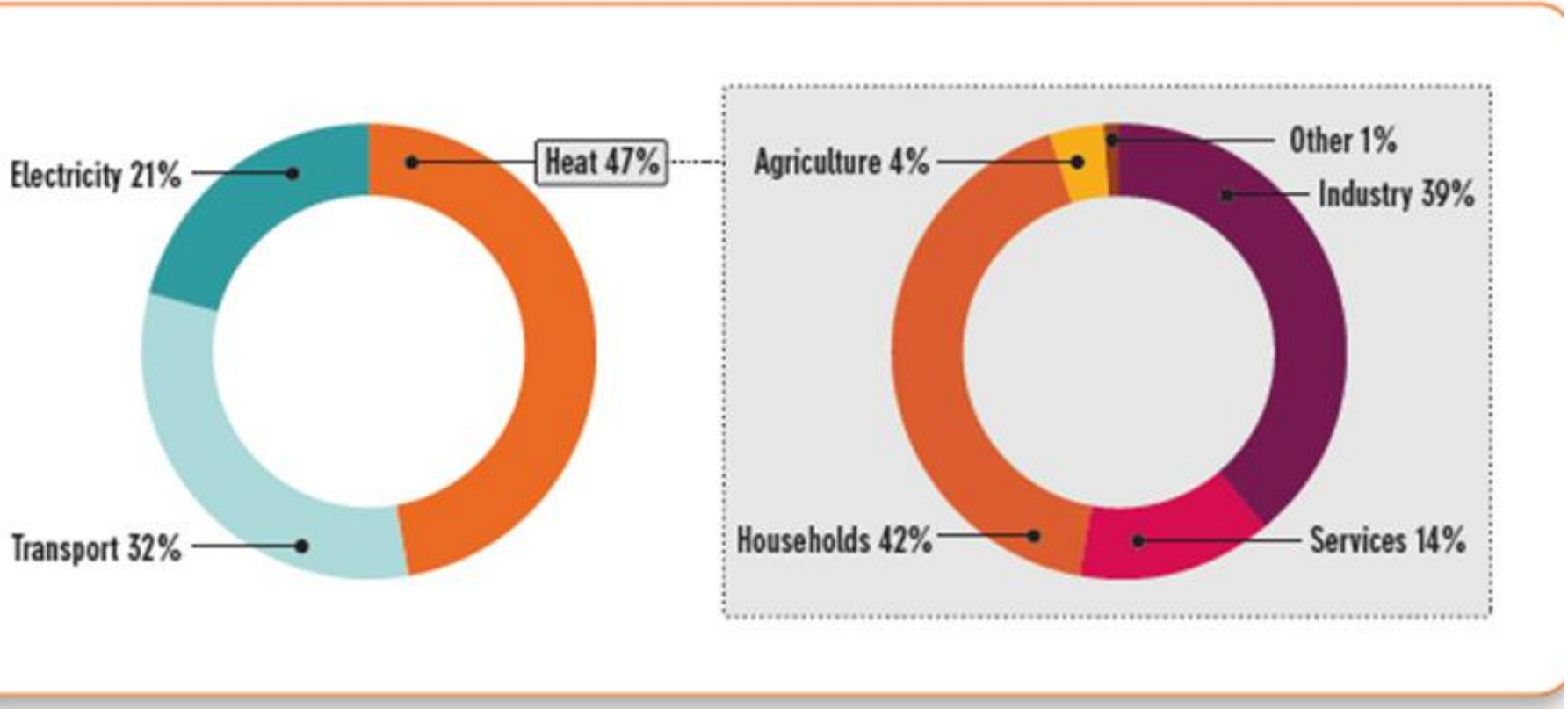


Major energy challenges in Europe (iii)
Decarbonisation

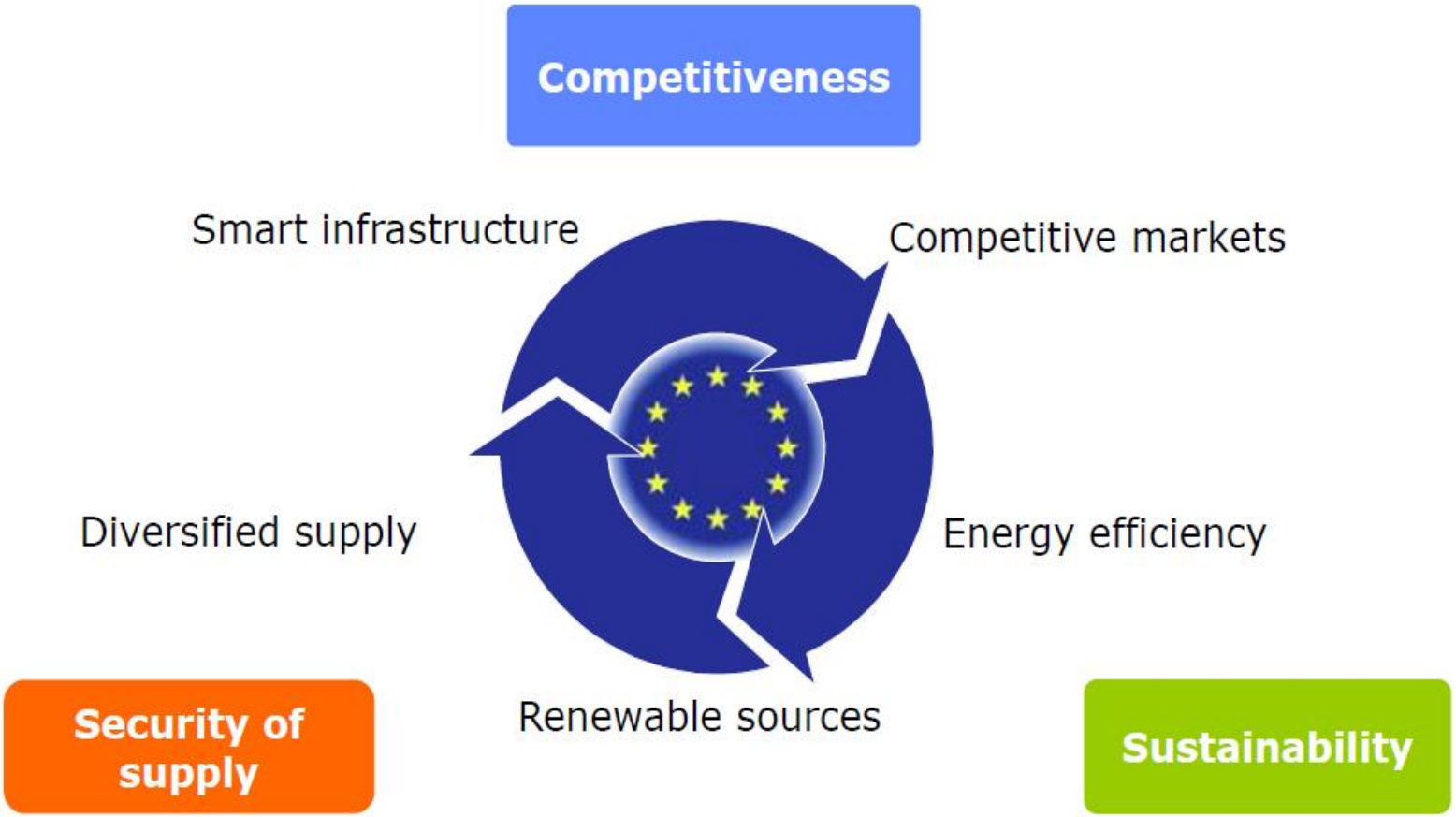


Major energy challenges in Europe (iv)

Final use of energy by type of energy



A "no regrets" scenario for Europe



European Union energy policy objectives

2020

- **20%** less greenhouse gases
- **20%** renewable Energy
- **20%** Energy savings

2030

- **40%** less greenhouse gases
- **27%** renewable Energy
- **27%** Energy savings

2015

Energy Union

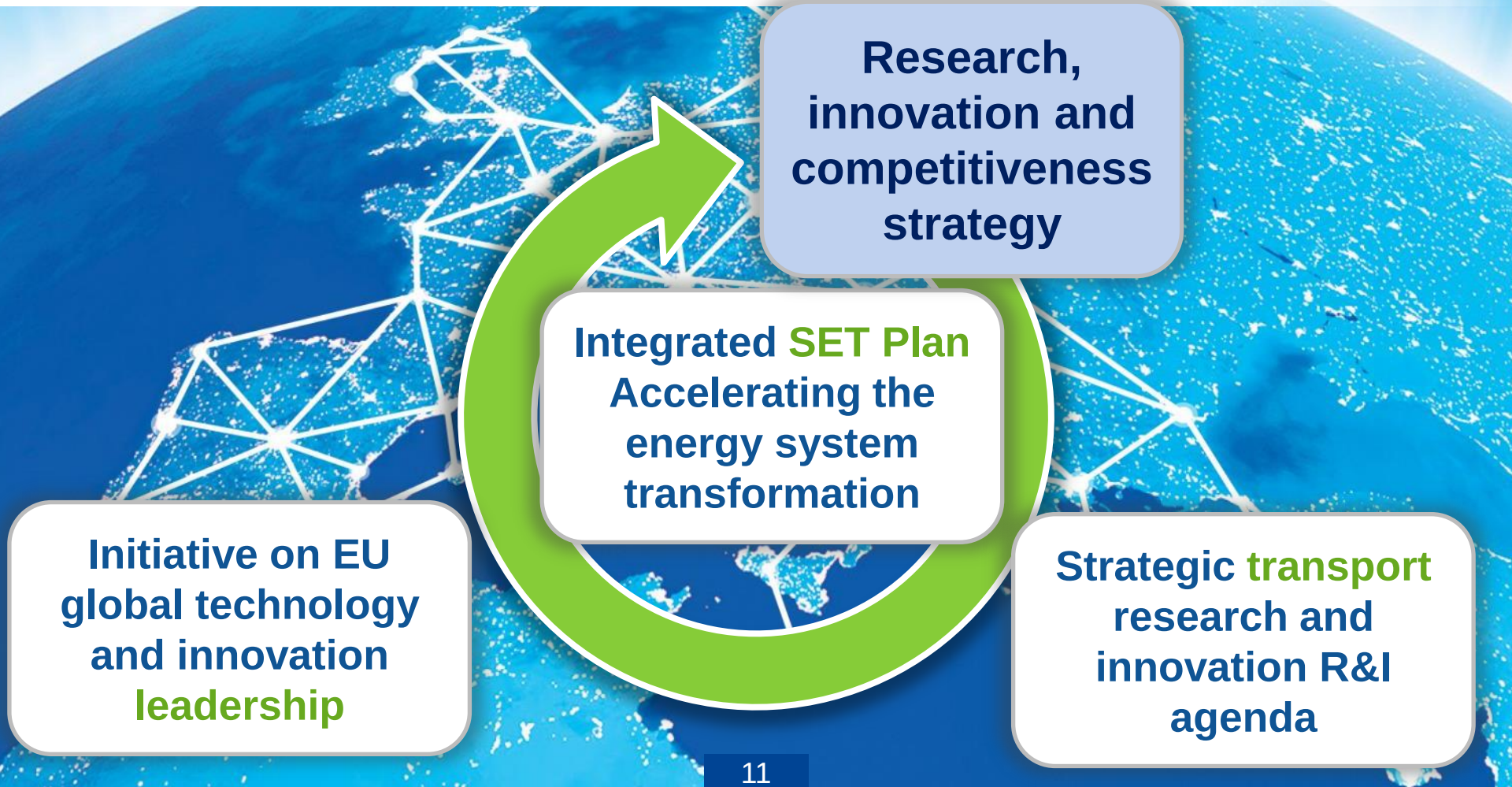
5 GUIDING DIMENSIONS

The Energy Union's 5 dimensions

5 GUIDING DIMENSIONS

1. Energy security, solidarity and trust,
2. A fully integrated internal energy market,
3. Energy Efficiency first,
4. Transition to a long-lasting low-carbon society,
5. An Energy Union for Research, Innovation and Competiveness.

The Energy Union's 5th dimension in practise



European Commission

EU Energy

Technologies and innovation

Strategy

SET PLAN

2008: The SET Plan

Focus on technologies with market impact up to 2020 (set up of EIIs)

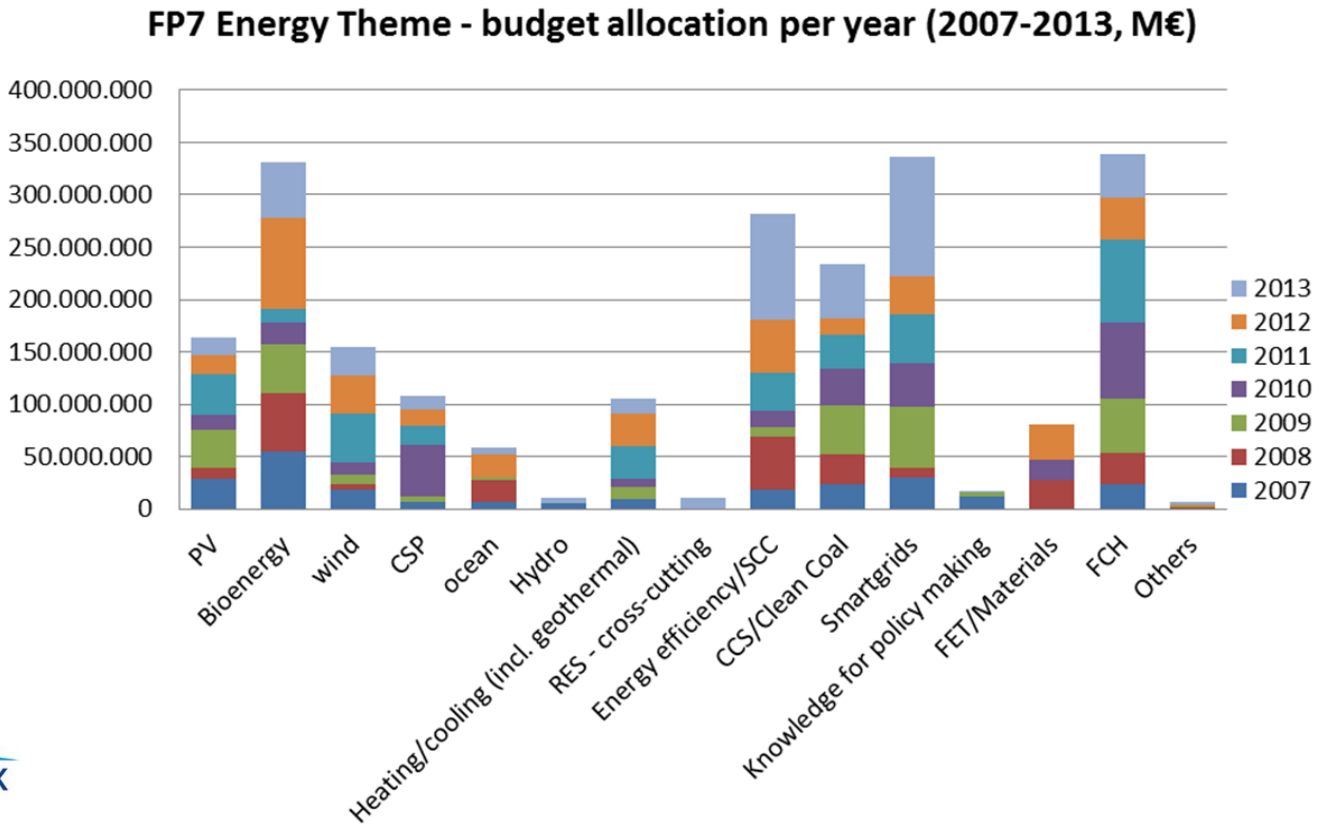
- Wind
- Solar
- Electricity grids
- CCS
- Bioenergy
- Nuclear
- Smart Cities and Communities
- Fuel cells and hydrogen

Focus on longer-term research actions beyond 2020 (set up of EERA)

Objective for 2020

- 20% reduction of CO2 emissions (base1990)
- 20% share of Renewable Energy
- 20% improvement in Energy Efficiency

Implementation: FP7 2007-2013



FP7: 50.5 bEur total funding (7 years)

Energy: 2.5 bEur (5%)

Investments R&I accross EU

EUR 2.8bn (2007)

EUR 7.1bn (2011)

Implementation: FP7 – demo projects

GRID 4 EU

6 DSOs (cover more than 50% of the metered electricity customers in Europe)

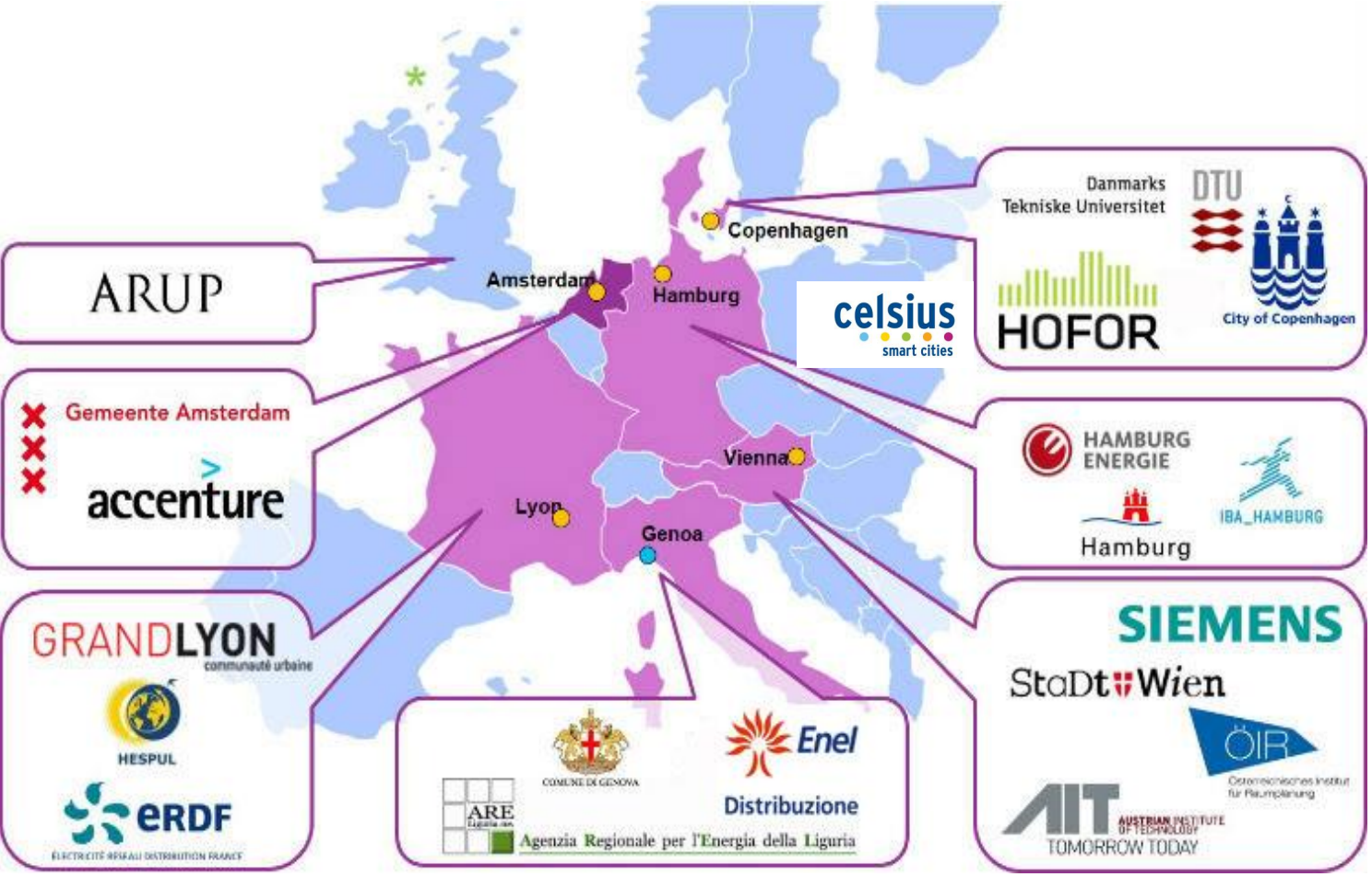
27 partners (Utilities, Energy Suppliers, Manufacturers, Research Institutes)

Duration: 51 months (November 2011 - January 2016

EU contribution:
24 mil. EUR out of 54 mill of the overall cost

Implementation: FP7 – demo projects

TRANSFORM – Smart Cities project



Six cities

Quantitative and qualitative **integration of their current energy strategies**

Implementation of these **strategies in the urban context.**

Implementation: FP7 – demo projects

There is enough waste heat produced in the EU to heat EU's entire building stock

- Demonstrate 10 Innovative Integrations of heat/cool supply in DHC in 5 Cities - Göteborg (SWE), Rotterdam (NL), London (UK), Cologne (D), Genova (IT)
- Monitor 20 existing demos
- Promote the roll out of DHC solutions
  - Toolbox
  - Follower cities: 100 cities to commit to the CELSIUS roadmap by 2017

2015: An Integrated SET Plan

Accelerating the European Energy System Transformation

EUROPEAN COMMISSION

Brussels, 15.9.2015
C(2015) 6317 final

COMMUNICATION FROM THE COMMISSION

Towards an Integrated Strategic Energy Technology (SET) Plan: Accelerating the European Energy System Transformation

https://ec.europa.eu/energy/en/news/integrated-set-plan-fit-new-challenges

The Integrated SET Plan – main actions

Number one in RES

Technology leadership by developing **highly performant renewables** technologies and their **integration** in the system

Cost efficient key technologies

The Integrated SET Plan – main actions (II)

Consumer at the centre of the future energy system

Smart homes, smart cities

Resilience, security and smartness of the energy system

The Integrated SET Plan – main actions (III)

Efficient energy systems

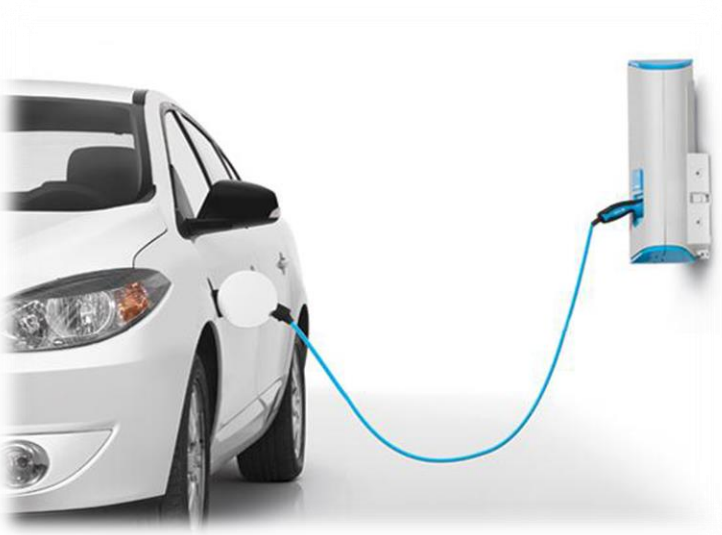
New materials and technologies for energy efficiency solutions for buildings

Continue efforts to make EU industry less energy intensive and more competitive

The Integrated SET Plan – main actions (IV)

Sustainable transport

Become competitive in the global battery sector



Renewable fuels needed for sustainable transport solutions

The Integrated SET Plan – additional actions (V)

European Commission

A forward-looking approach to carbon capture and storage (CCS) and carbon capture and use (CCU)

Increase safety in the use of nuclear energy

Integrated Roadmap, Energy Union and SET Plan

SET Plan Integrated Roadmap (13 themes)	ENERGY UNION R&I & Competitiveness priorities	SET Plan (10 key actions)
T10: Development of renewables T8: System flexibility	N°1 in Renewables	1. Performant renewable technologies integrated in the system 2. Reduce costs of technologies
T1: Engaging consumers T2: Smart technologies for consumers	Smart EU Energy System with consumers at the centre	3. New technologies & services for consumers
T6: Modernising the electricity grid T7: Energy storage T8: System flexibility T9: Smart cities & communities		4. Resilience & security of energy system
T3: Energy efficiency in buildings T4: Energy efficiency in heating & cooling T5: Energy efficiency in industry & services	Efficient Energy Systems	5. New materials & technologies for buildings 6. Energy efficiency for industry
T7: Energy storage T13: Biofuels, fuel cells & hydrogen, alternative fuels	Sustainable Transport	7. Competitive in global battery sector (e-mobility) 8. Renewable fuels
T11: Carbon capture storage/use		9. CCS/U
T12: Nuclear energy		10. Nuclear Safety

SET Plan fit for the new challenges

New impulse to the partnership

Principles: Targeted focus, integrated approach, new governance

Changes:

SET Plan in the Energy Union

Widening to new actors

More joint actions

Transparency, indicators and reporting

Monitoring and knowledge sharing

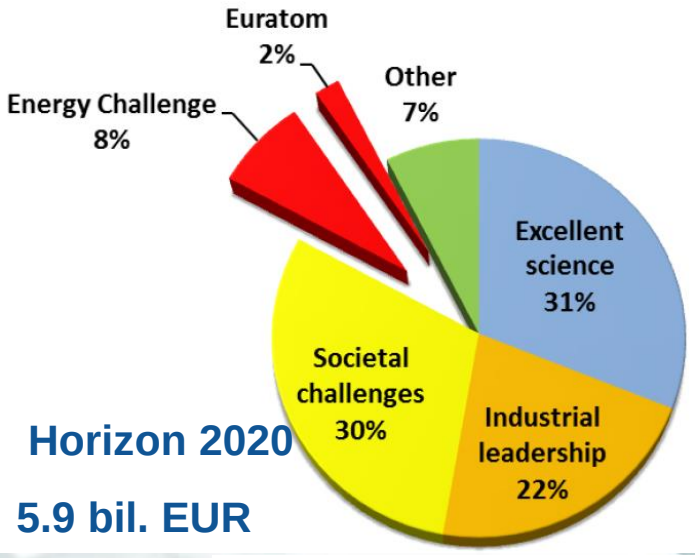
Financing

Develop and bring innovations to the market

Overcome 'valley of death'

Better articulation of funding sources: H2020, EFSI, ESFI…

Create demand for innovative products and services: adding market pull to technology push



Horizon 2020

5.9 bil. EUR

European Investment Bank

InnoFin

Cohesion policy

38 bil. EUR – low carbon economy

40 bil. EUR – R&I

33 bil. EUR - SMEs

Financing – H2020

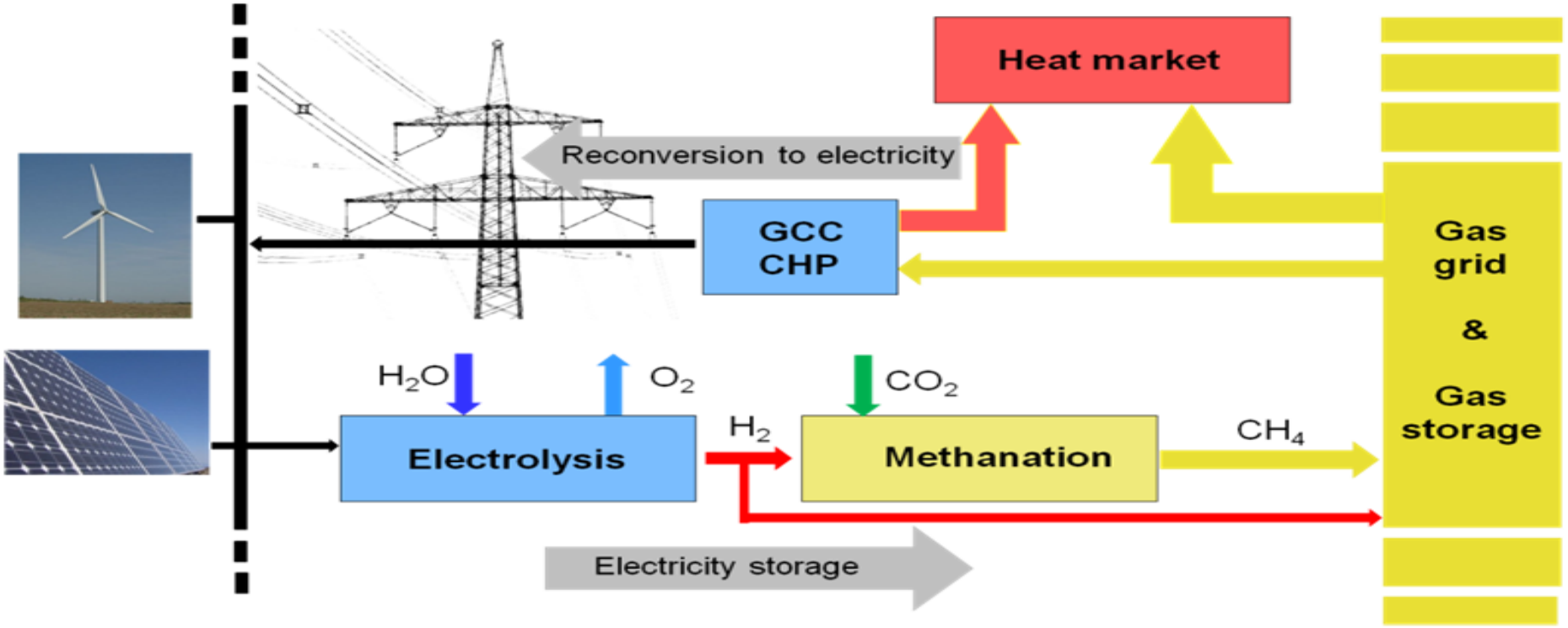
THE EU FRAMEWORK PROGRAMME
FOR RESEARCH AND INNOVATION

HORIZON 2020

H2020 Energy Storage projects

STOREandGO

AIM: to bring the Power-to-Gas technology as Power-to-Methane solution by demonstrating it in three different demonstration environments.



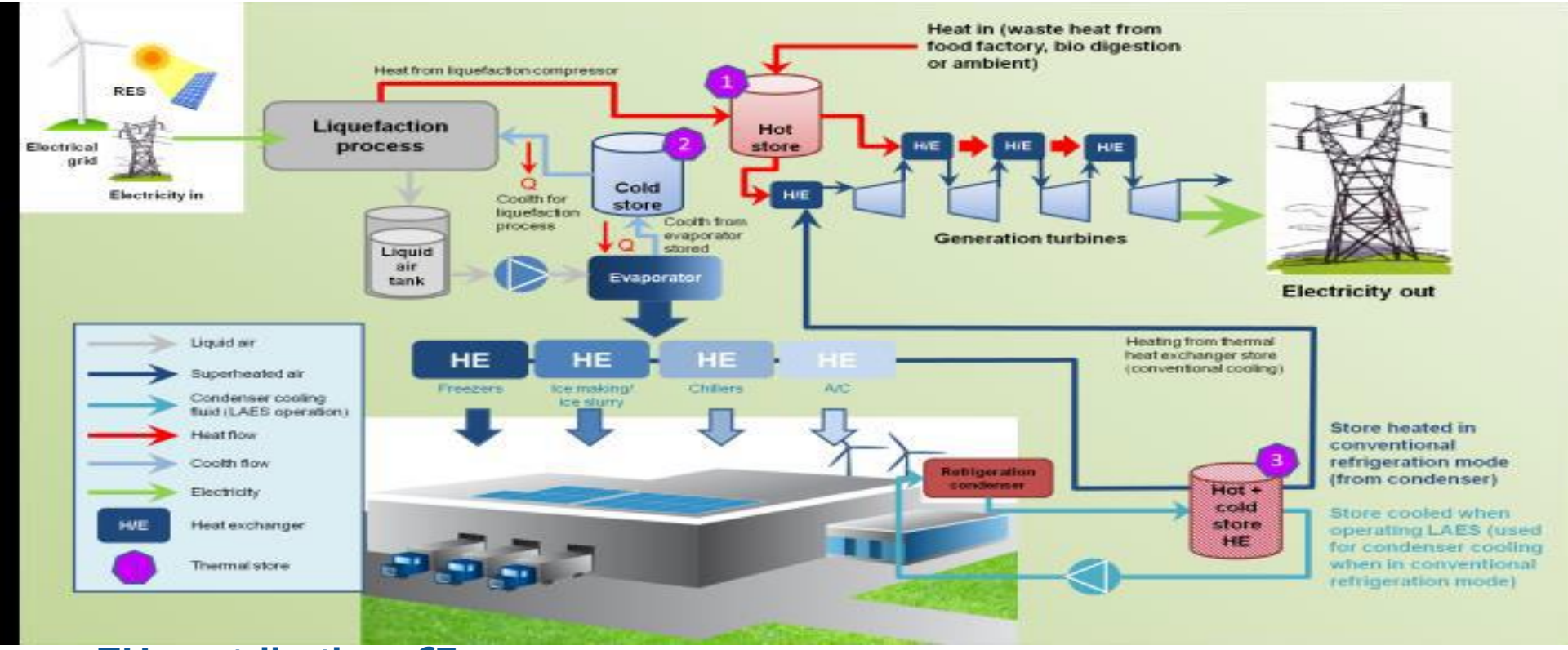
EU contribution: € 17,9m

27 partners, Coordinator: German Technical and Scientific Association for Gas and Water (DVGW)

Duration 48 months, start 2016 – end 2019

CryoHub

AIM: to demonstrate Liquid Air Energy Storage and show that it is an economic low carbon option for refrigerated warehouses and food factories.



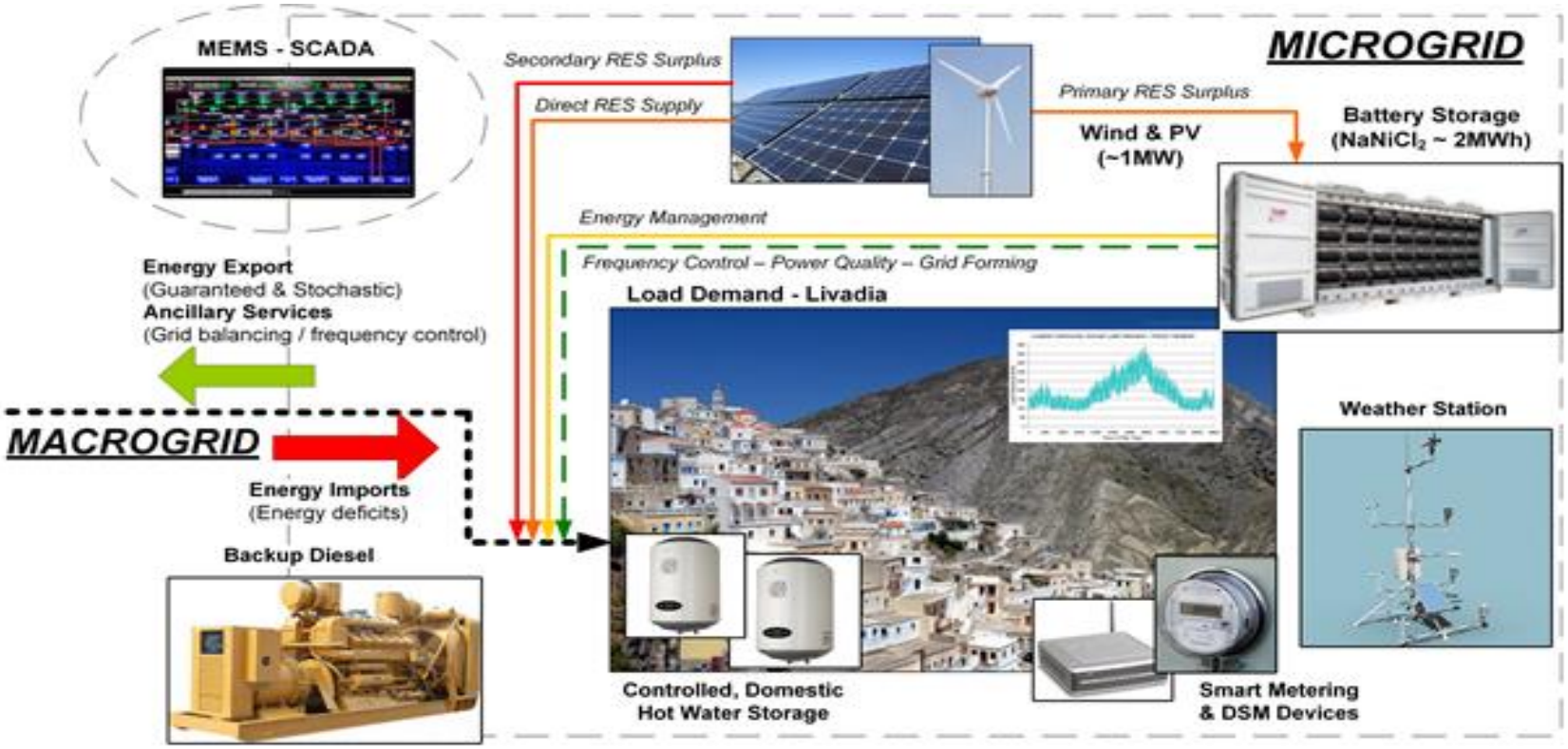
EU contribution: €7m

14 partners, Coordinator: London South Bank University

Duration 42 months, start 2016 – mid 2019

TILOS

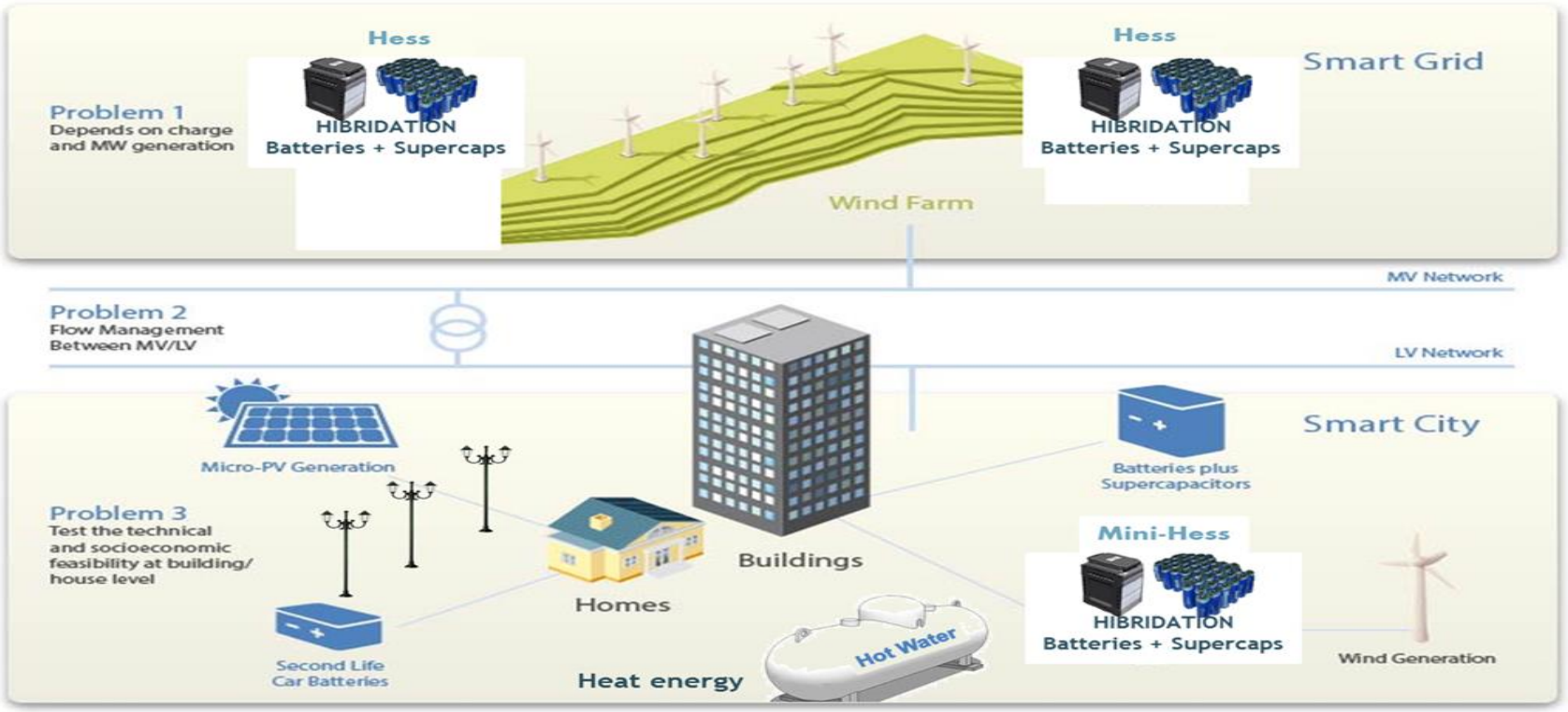
AIM: to test the integration of an innovative local-scale molten-salt, battery-storage system on the island of Tilos (Greece)



EU contribution: €11m
15 partners, Coordinator: Technological Educational Institute of Piraeus
Duration 48 months, start Feb 2015 – Jan 2019

NETFFICIENT

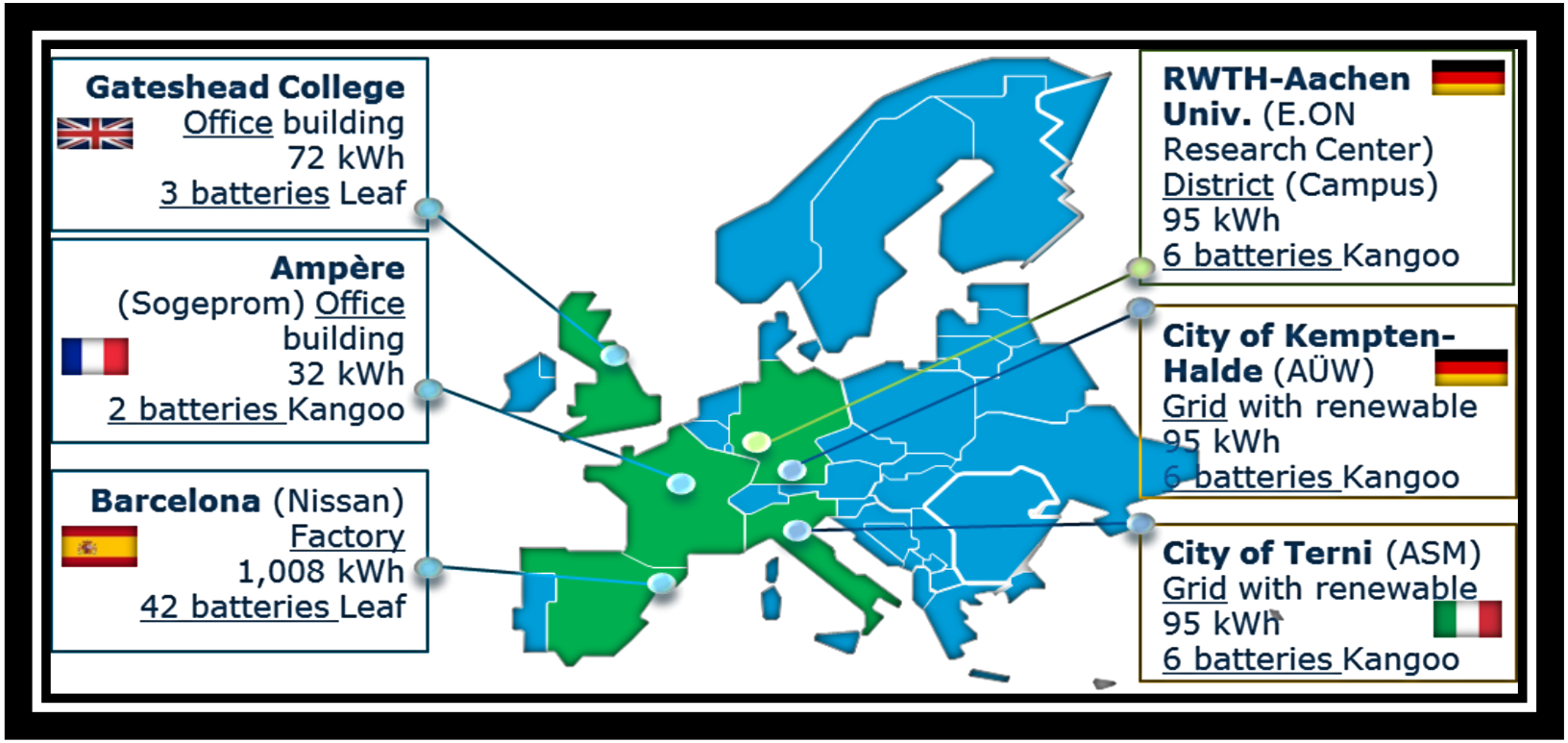
AIM: to test different local energy storage technologies in a real electrical grid on the German Island of Borkum



EU contribution €9m
13 partners, Coordinator: AYESA Advanced technologies SA
Duration 48 months, start Jan 2015 – Dec 2018

ELSA

AIM: Development of local energy storage systems using electrical vehicles batteries for Smart Buildings and Smart Grid applications



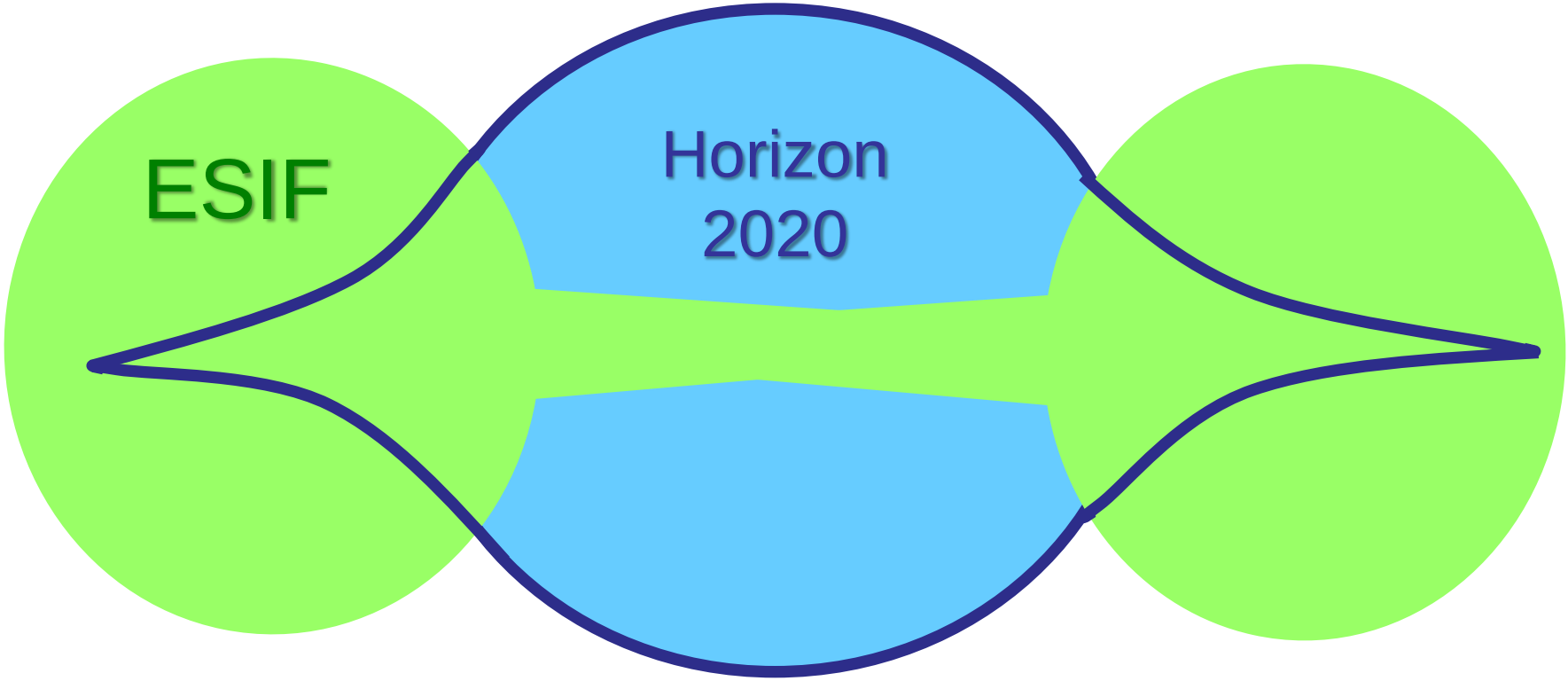
EU contribution 9,8 €m

10 partners, Coordinator: BOUYGUES ENERGIES & SERVICES (FR)

Duration 36 months, start Apr 2015 – Mar 2018

Implementation MS: Regional policy (I)

Synergies through sequential or parallel projects



"Staircase to Excellence"

National / Regional R&I systems

"Research Excellence"

Hopefully also excellence, but "Innovation Excellence"

Capacity Building

Research & Development

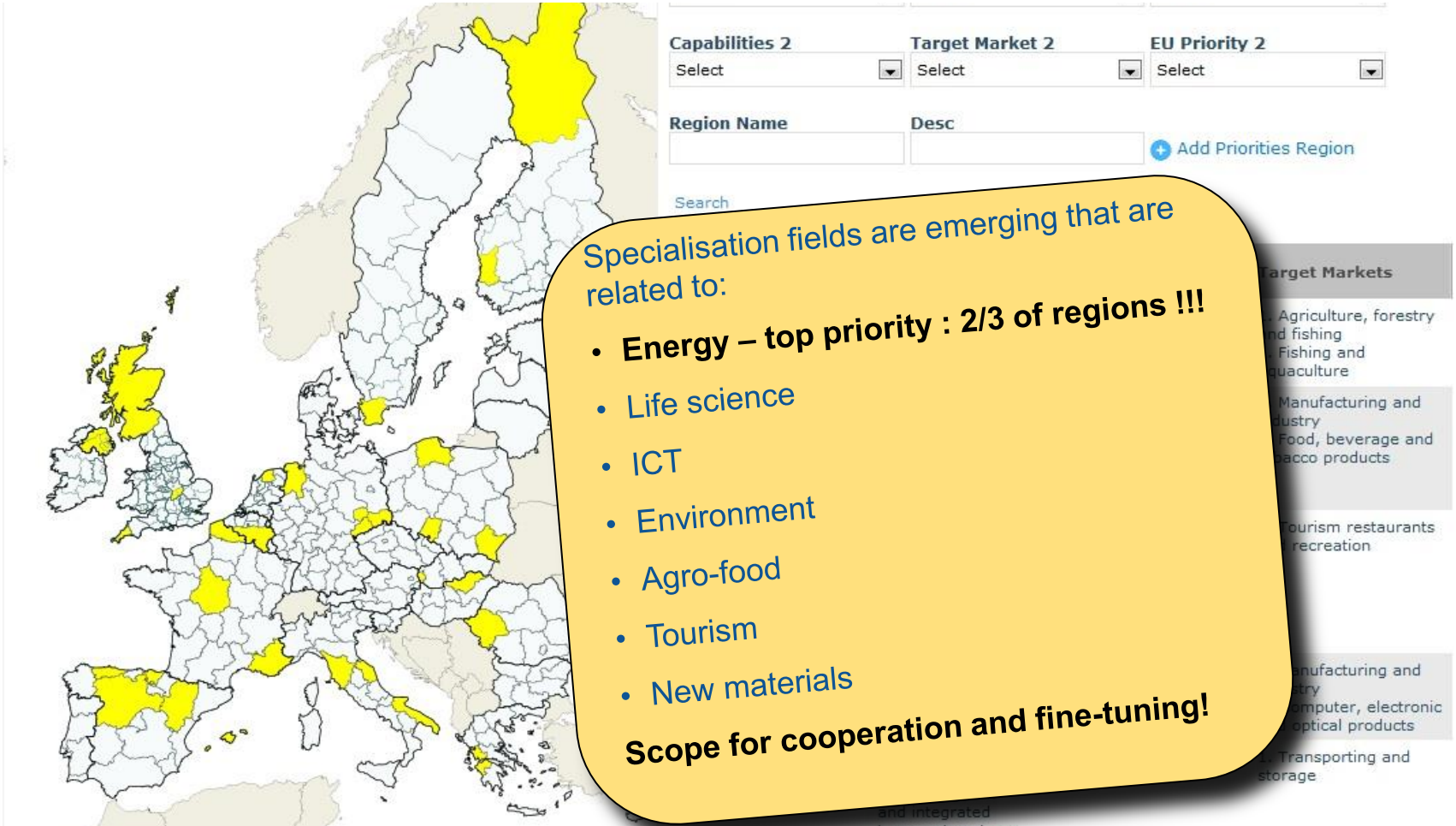
Innovation

Market

Implementation MS: Regional policy (II)

Check out the smart specialisations:

RIS3 mapping of regions' and MS intentions in terms of smart specialisation fields allows to detect possible partners:



Specialisation fields are emerging that are related to:

- **Energy – top priority : 2/3 of regions !!!**
- Life science
- ICT
- Environment
- Agro-food
- Tourism
- New materials

Scope for cooperation and fine-tuning!

See: http://s3platform.jrc.ec.europa.eu/eve-ris3;jsessionid=87skR80JmqXZLIWhxL8ZvyH9XYkGRTg62j2k1YVkctXQR0tRyWgQ!1058177620!1362916436845

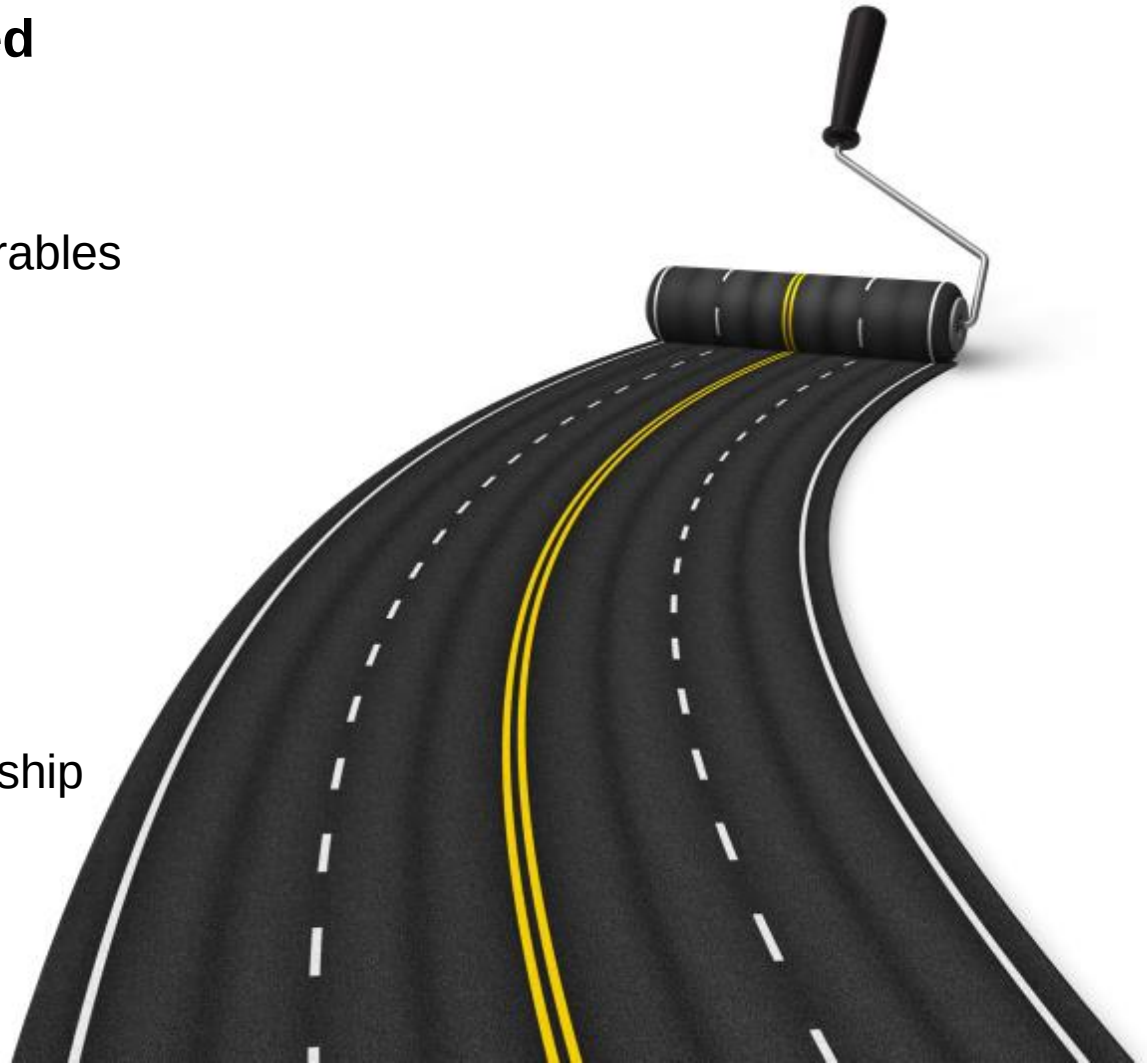
Next steps

- **Delivering on the Integrated SET Plan priority actions**

Define level of ambition, implementation, timing and deliverables

- **An overarching Research, innovation and competitiveness strategy**

(Strategic Transport Research and Innovation Agenda and the Global Technology and Innovation Leadership Initiative)



European Commission

Thank you

for your attention !

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