The European Commission's science and knowledge service

Joint Research Centre

The Joint Research Centre Supporting the EU Energy Union and Climate Policy

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European Commission

JRC sites

Headquarters in Brussels and research facilities located in **5 Member States:**

- Belgium (Geel)
- Germany (Karlsruhe)
- Italy (Ispra)
- The Netherlands (Petten)
- Spain (Seville)

JRC Role: facts & figures

€ 386 million Budget annually,
plus **€ 62** million earned income

6 locations in 5 Member States: Italy, Belgium, Germany, The Netherlands, Spain

Independent of private, commercial or national interests

Policy neutral:
has no policy agenda of its own

42 large scale research facilities, more than 110 online databases

JRC

30% of activities in policy preparation, **70%** in implementation

More than **3000** people

83% of core research staff with PhD's

125 instances of support to the EU policy-maker annually

More than **100** economic, bio-physical and nuclear models

Over 1,400
scientific publications per year

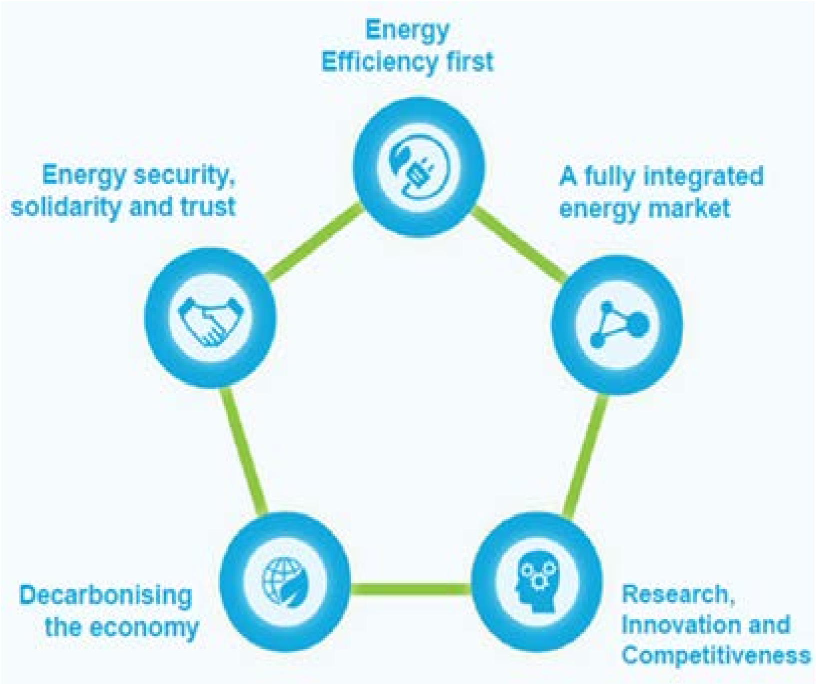
JRC in Energy, Transport and Climate

The mission of the JRC's Directorate for Energy, Transport and Climate is to provide support to Community policies and technology innovation related to:

energy – to support the deployment of sustainable, safe, secure and efficient energy production, distribution and use

transport – to foster sustainable and efficient mobility in Europe

climate – to provide scientific and technical analyses in support of integrated air quality, climate and related policies

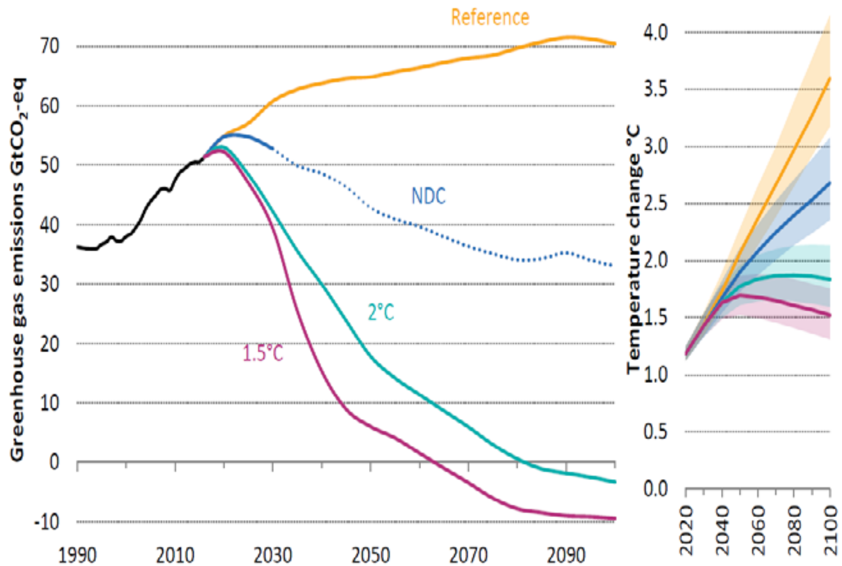


Policy support with and for key partners

Within the Commission	• SG, ENER, CLIMA, ENV, GROW, MOVE, REGIO, RTD, DEVCO, NEAR, MARE, JUST, COMP, EPSC,...
Other EU Institutions and Member States	• EU Parliament • MS authorities: national (Cyprus, Greece), regional and local authorities..
External partners	• VECC China, NCSC China, AIST Japan, US DoE, Fraunhoefer Society, Universities, standardisation & regulation bodies (UNECE, ISO, CEN-CENELEC)...

Policy support reinforced by scientific excellence

Long Term Vision - global context
A Clean Planet for All



- **Global/EU Macroeconomic Framework: JRC-GEM-E3**
- **Global Energy Scenarios: POLES-JRC**
- **Global Energy and Climate Outlook (GECO) Report Series**

In-depth analysis supporting the Communication, Long Term Strategy, 393 pages

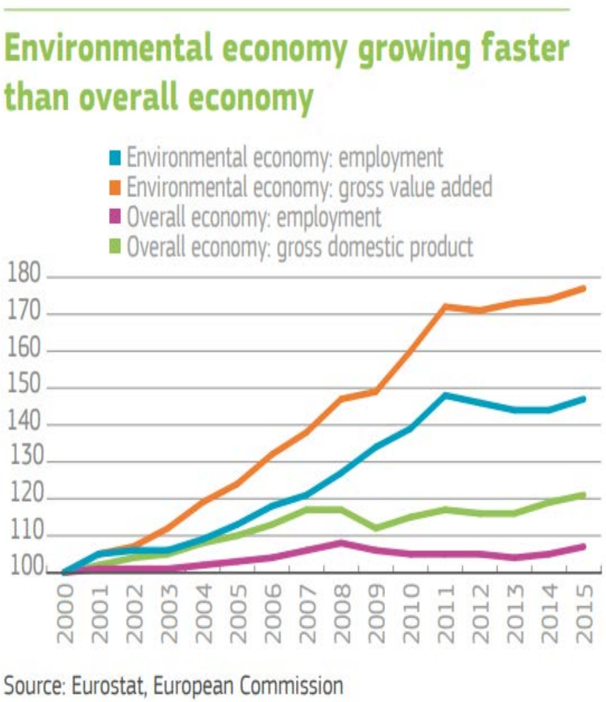
The transition offers opportunities for growth & jobs

Sector	Share of total jobs in 2015	Range of change in jobs by 2050 compared to baseline
Construction		↗
Power generation		↗
Agriculture		↗
Services		→
Manufacturing (energy-int)		→
Other manufacturing		→
Mining & extraction		↓

Faster growth of EU **clean economy** than the overall economy

Struggling traditional, fossil fuel based industries

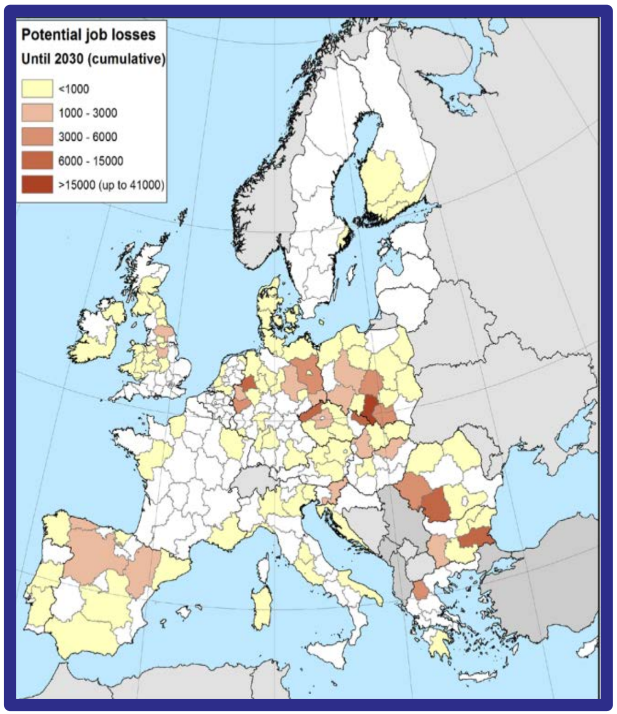
Sector analysis helps to identify growth opportunities and vulnerable groups to protect



Based on JRC GEM-E3 model results

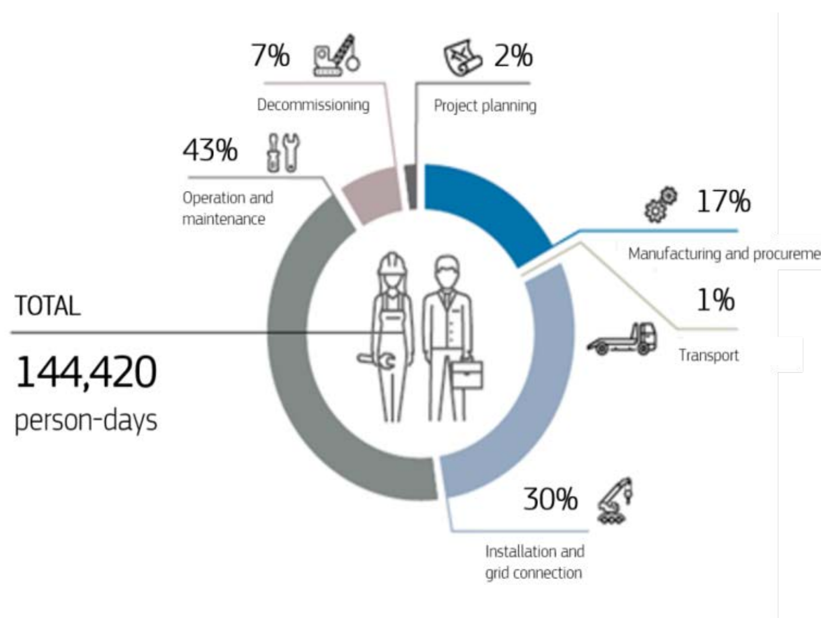
A *fair* transition to a climate-neutral economy

The European coal sector



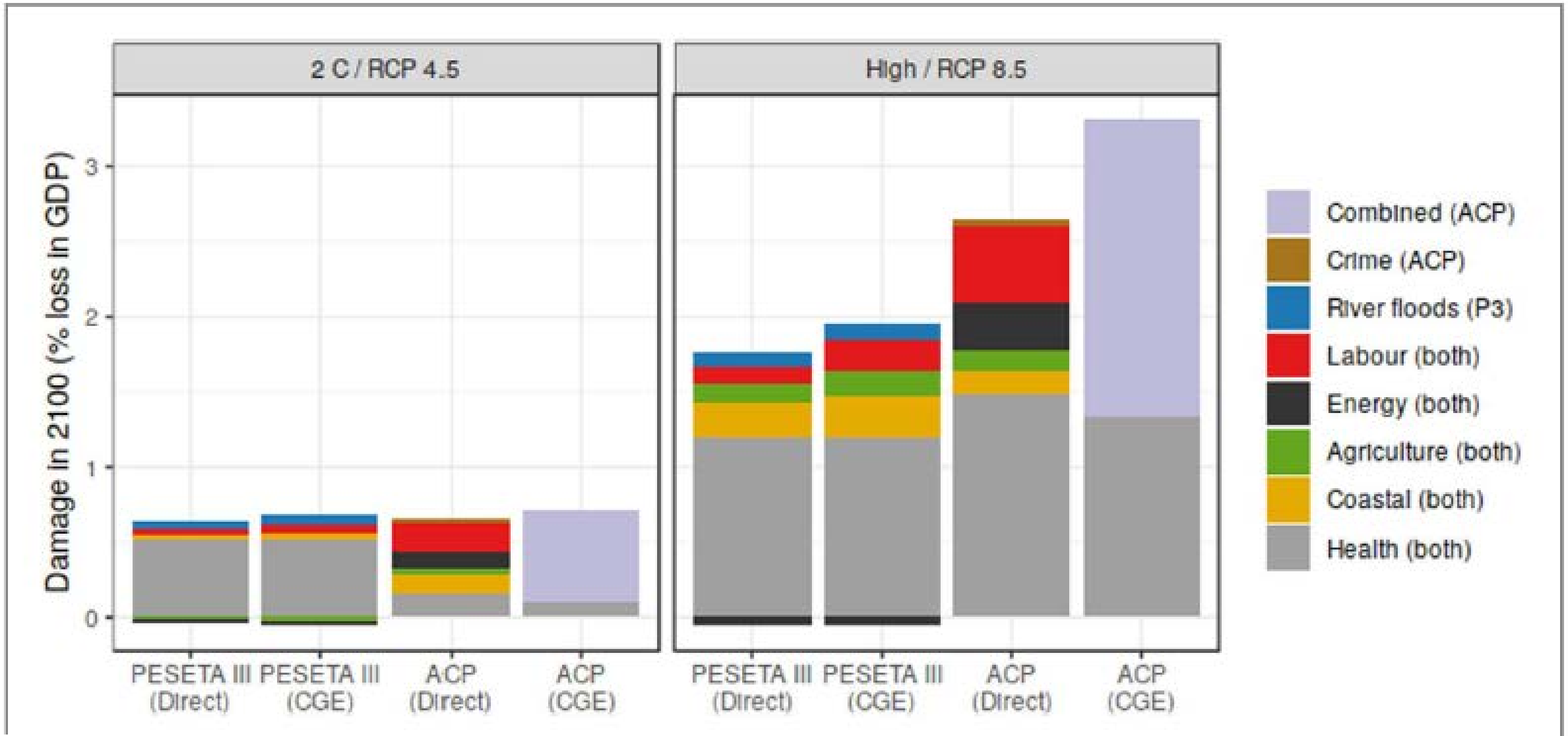
- **240 000 direct jobs**
  - 55 000 in power stations
  - 185 000 in mining
- **215 000 indirect jobs**

Distribution of jobs in the production of a 50 MW wind farm



Source: JRC (2018). EU coal regions: opportunities and challenges ahead. Science for Policy report. (left map) and IRENA (right figure)

Evaluating Climate Change Impacts and Adaptation



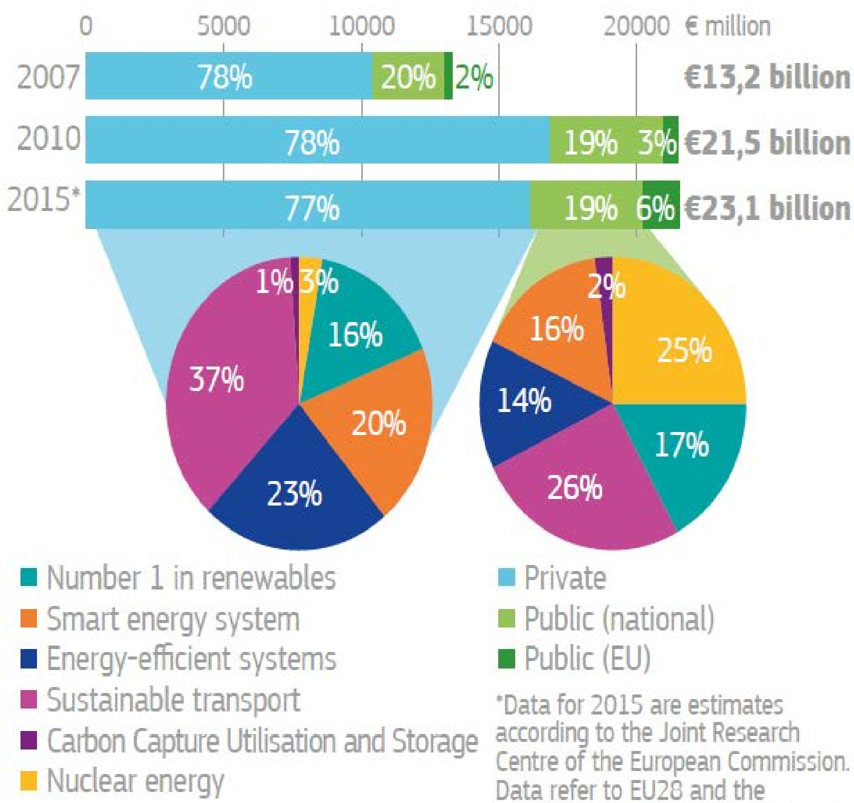
Impact Decomposition on EU and US Economies under 2 emission pathways

Source: Juan-Carlos Ciscar *et al* 2019 *Environ. Res. Lett.* **14** 084010, JRC PESETA III and American Climate Prospectus

The key role of innovation

Monitoring energy R&I

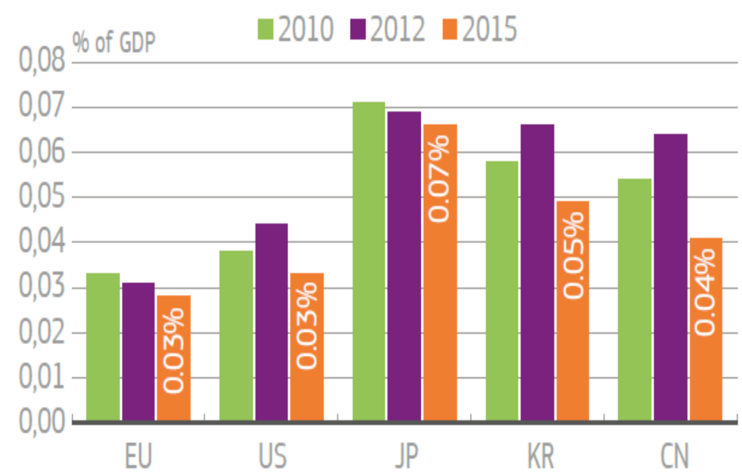
Private research spending on the up in Europe



*Data for 2015 are estimates according to the Joint Research Centre of the European Commission. Data refer to EU28 and the associated countries participating in the SET-Plan (CH, TK, NO, IS).

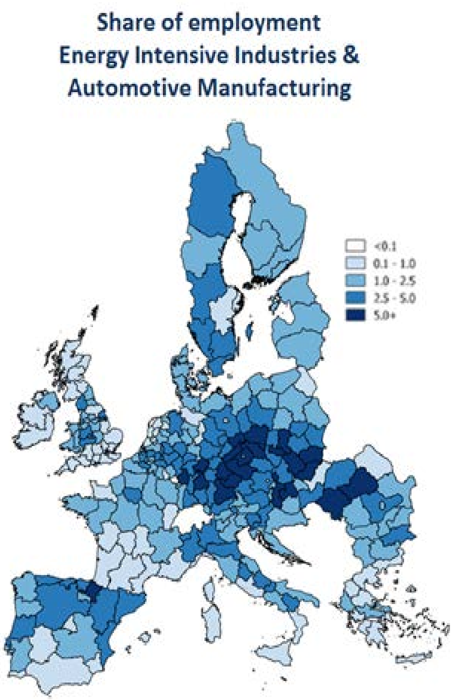
Source: Joint Research Centre

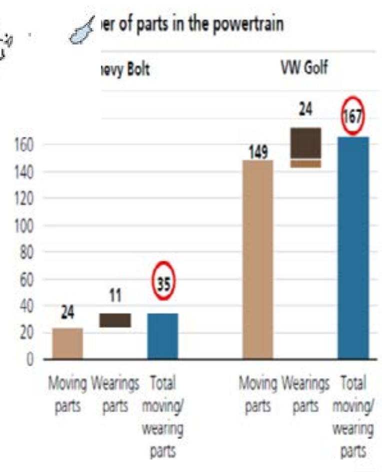
But the EU ranks last among major economies in terms of R&I investments as a share of GDP



Source: Joint Research Centre

Societal Implications of Mobility Transition





Source: UBS 2017

Future mobility scenarios

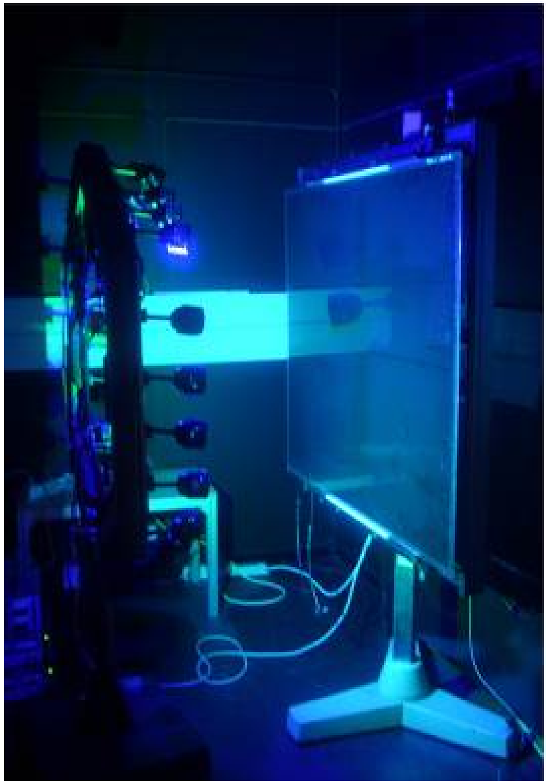
- **Technology uptake, transport demand**
- **Impact on production, maintenance, infrastructure,…**

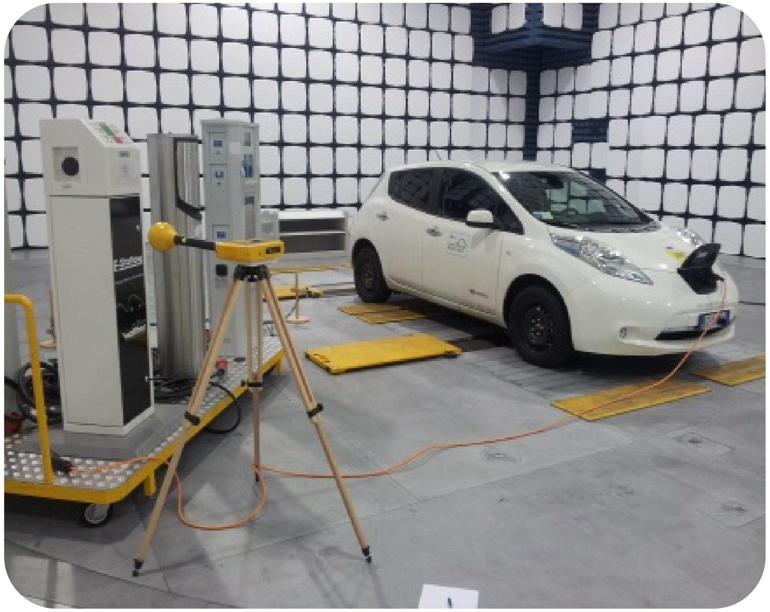
Macro-Economic modelling JRC GEM-E3

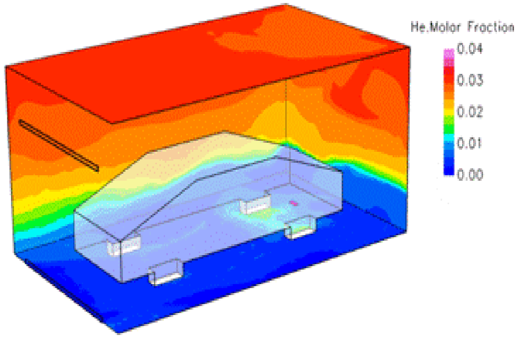
- **Impact on economy, energy, environment, employment**

Impact on skills/jobs/trade/GDP

Contribution to Regulations, Codes & Standards







JRC Living Lab
Future Mobility Solutions

JRC Ispra

167 ha

of fenced-in land

36 km

of internal roads

2200+

intl. staff and visitors

Innovation in Green Batteries

Sustainability and circular economy

EU Battery Initiative

Coordinating R&I efforts on green batteries

BatteRIes Europe European Technology and Innovation Platform

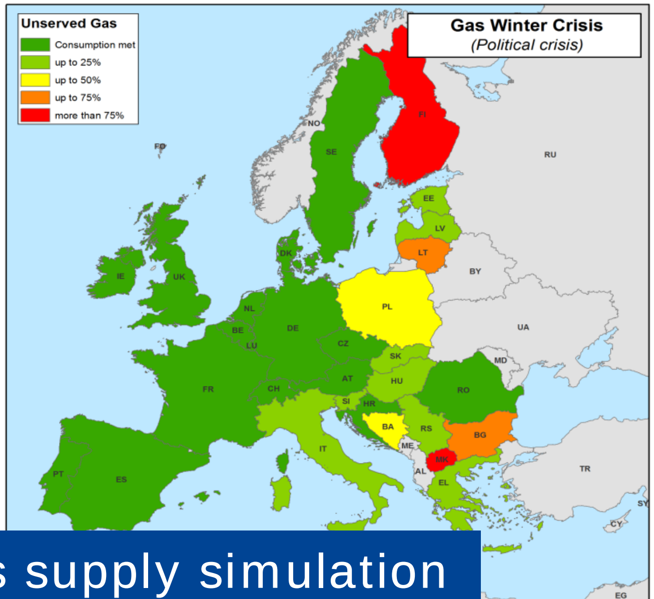
BATTERIES EUROPE

European Technology and Innovation Platform

JRC activities

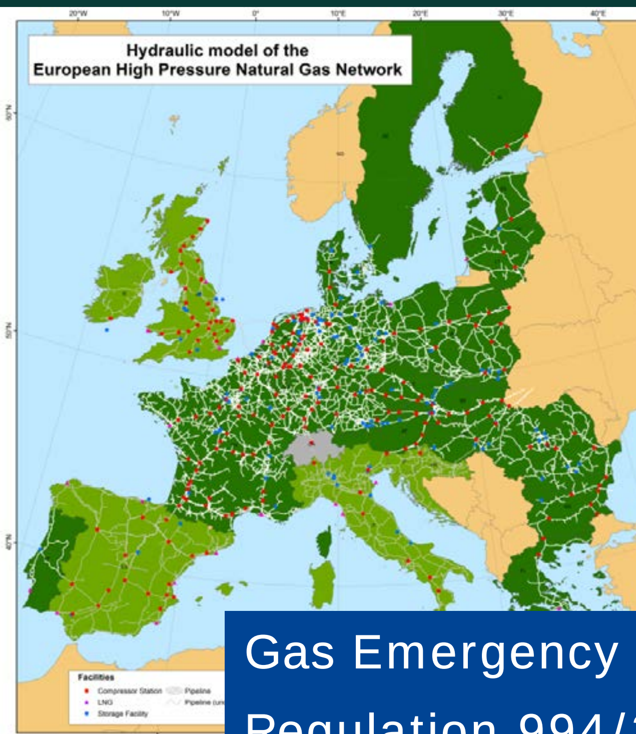
- EC-coordinator in SET-Plan Action 7
- Will be involved throughout ETIP Batteries
- Life Cycle Assessment of **Second Life** of vehicles batteries
- Circular Economy perspectives for the management of Batteries used in Electric Vehicles – **Ecodesign** regulation on batteries
- Waste and recycling: contribution to the new **Batteries Waste Directive**

Security of Supply



Gas supply simulation

Stress tests

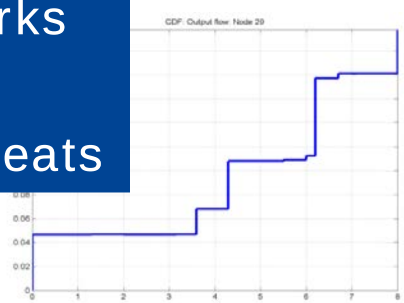


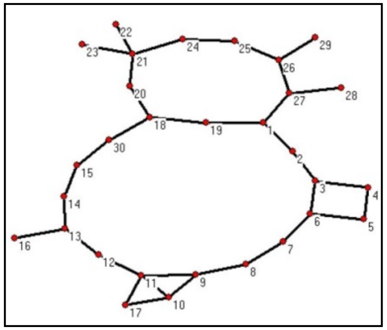
Gas Emergency Plans

Regulation 994/2010

Reliability of gas networks

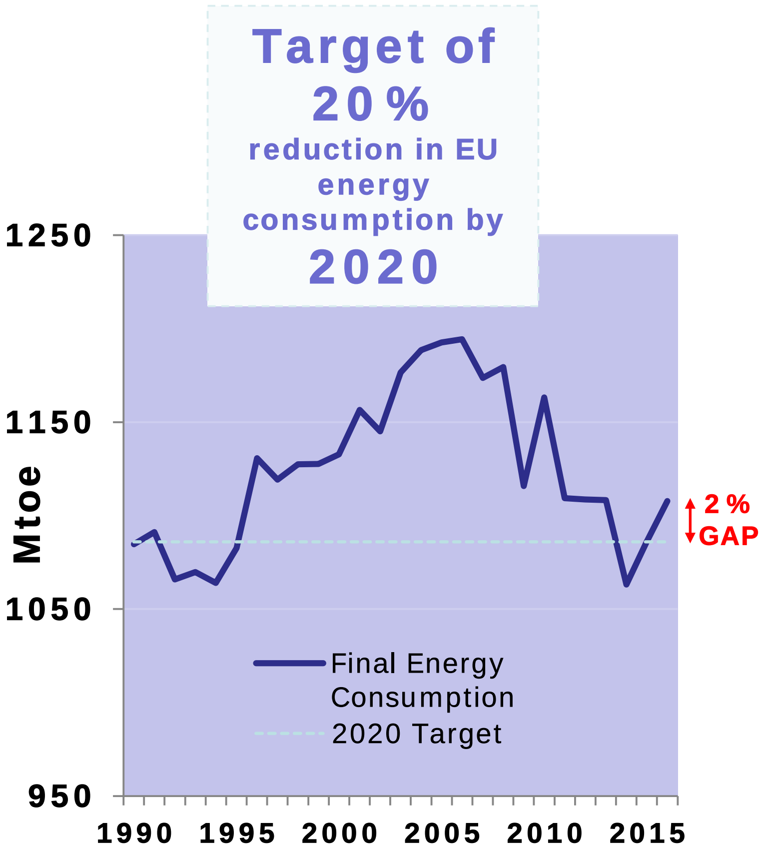
Disruptions from intentional/accidental threats





Energy Efficiency

Progress towards 2020 EU energy efficiency targets



Is it all due to efficiency?

- Examination of drivers behind EU energy consumption trends
- Assessment of National Energy Efficiency Action Plans
- Assessment of Annual Progress Reports

JRC analysis feeds into:

- State of Energy Union Report
- Energy Efficiency Progress Report by DG ENER
- Guidelines on National Energy Efficiency Action Plans

Our contribution continues under new **Energy Union Governance** Regulation

Global Covenant of Mayors: *Impact assessment*

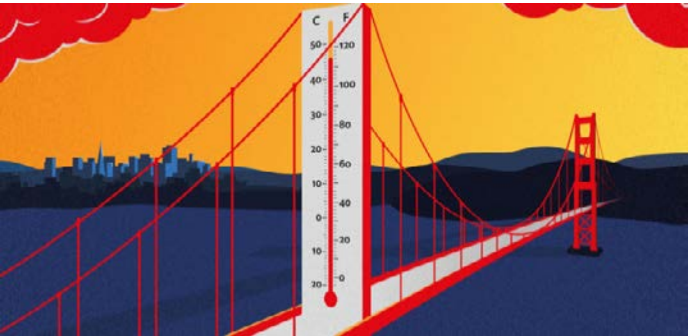
- Common data reporting framework for city and local governments' greenhouse gas emission inventories, climate risks and vulnerabilities is being developed

- Aggregated **collective potential** of Global CoM 2018:

9149 cities (85% EU), from 120 countries (covering 780+ million inhabitants, 10.5% of the global population),

if fully implemented, could achieve annual reductions of

- ✓ **1.4 GtCO_2-eq in 2030**
- ✓ **2.8 GtCO_2-eq in 2050** from BAU.

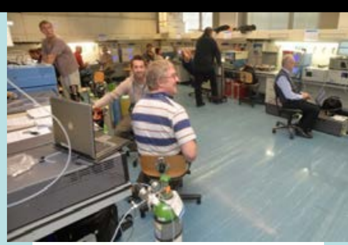


Air Quality

JRC chairs

Harmonising monitoring

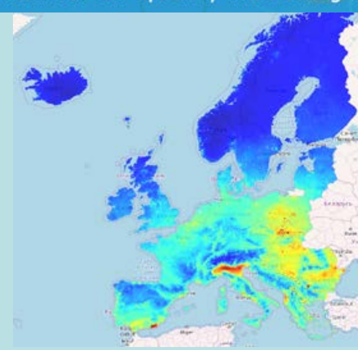
JRC European Reference Laboratory for Air Pollution



AQUILA Air Quality Reference Laboratories

Harmonising models

FAIRMODE
Forum for air quality modelling in Europe



SHERPA
Screening for High Emission Reduction Potential on Air

Designing action plans

SHERPA city

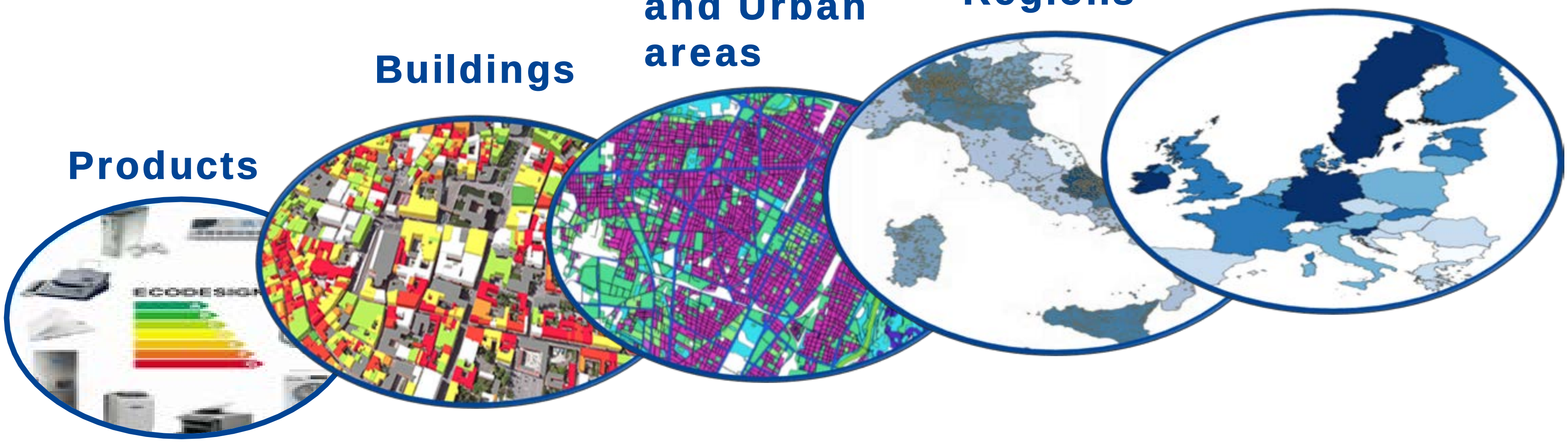
cen European Committee for Standardization

JRC DIR C in a nutshell

Supporting energy, transport and climate policies at different scales

- **Coherent and integrated assessment**
- Geographical Information Systems
- **Regional gap**

Products | **Buildings** | **Cities and Urban areas** | **Regions** | **Member States / EU 28**



Products	Buildings	Cities and Urban areas	Regions	Member States / EU 28
Energy label Ecolabel Directives	Energy Performance of **Buildings** Directive	Covenant of Mayors **(Cities)**	Smart Specialisation **(Regions)**	Global Scenarios, EU Energy Projections, Energy Efficiency – Renewable Energy Directives

Thank you for your attention

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European Commission