Development of Low Carbon Society
JRC related activities and contributions

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Oslo, 18 June 2010

http://www.jrc.ec.europa.eu

The driving Policy Context 2008 - 2010

Four years ago: no comprehensive EU energy policy

March 2007 EU climate and energy package 20-20-20

Energy action plan

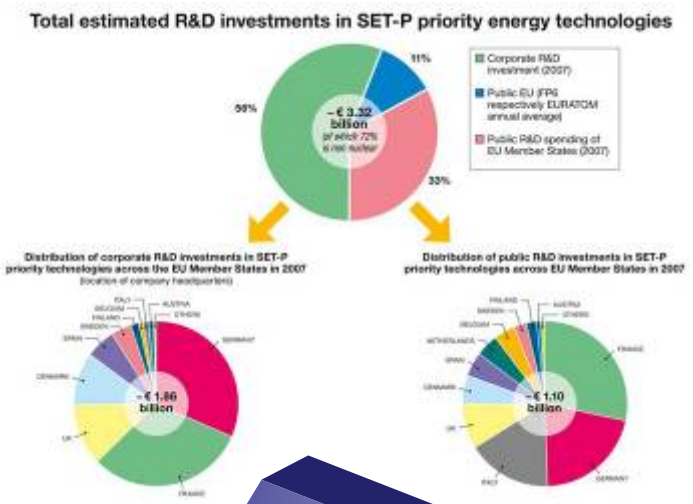
Energy action plan: concrete results:

- Third internal energy market package;
- Renewables directive;
- Nuclear safety directive;
- CO2 Emissions trading directives;
- Strategic Energy Technology Plan;
- Energy efficiency legislation, regional infrastructural projects…

2nd Strategic European Energy Review

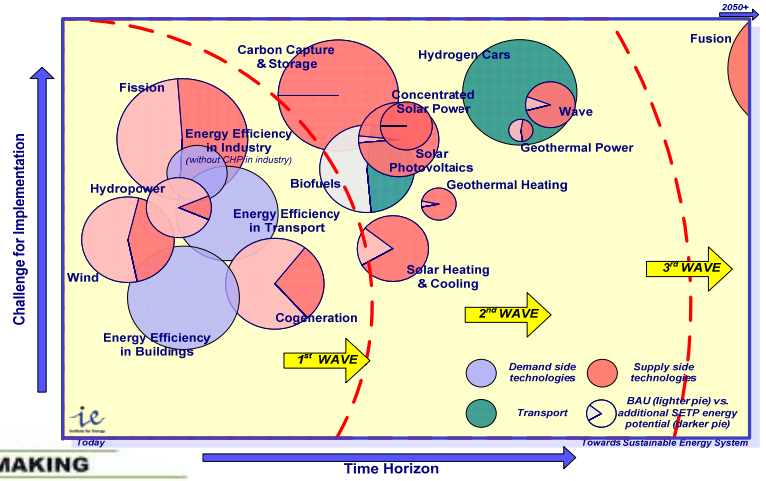
- Decarbonising the EU electricity supply by 2050
- Ending oil dependence in transport
- Low energy and positive power buildings & energy-efficient industry
- A smart interconnected electricity network
- Promoting a high-efficiency, low-carbon energy system throughout the world

Market Information, resources: Inputs



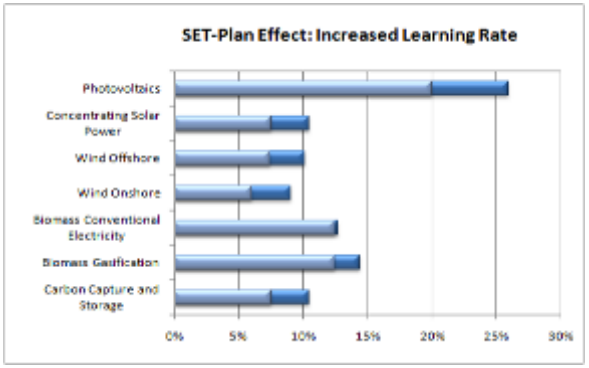
Capacity maps

Assessment Framework: Priorities



SETIS
PROVIDING INFORMATION FOR **DECISION-MAKING**

Implementation & Monitoring



Knowledge for Decision Making

ENERGY → SETIS –SET-Plan

SMARTS - Cities

manag€nergy

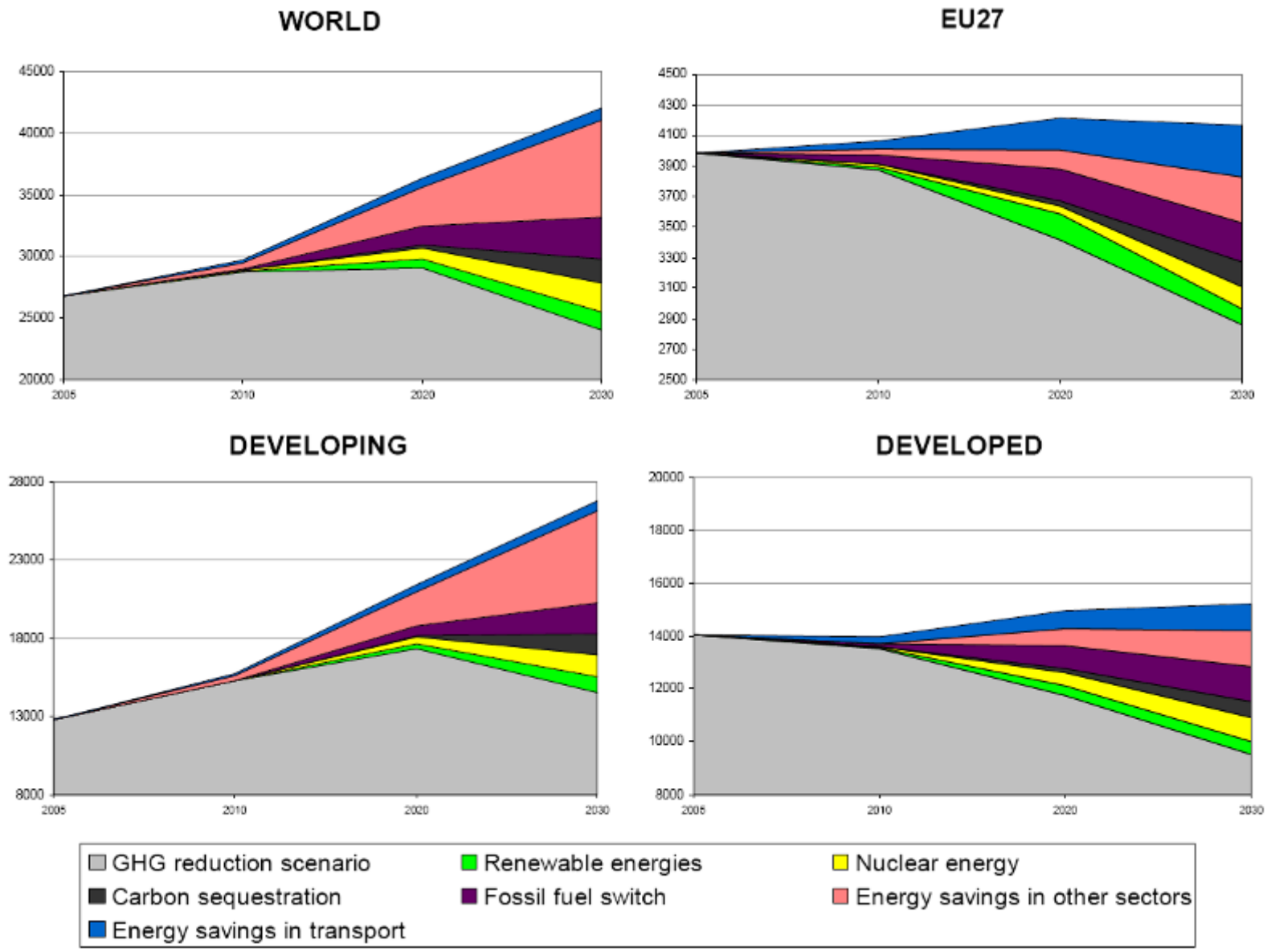
2007-8 PRIORITIES 2009 PLANNING 2010- IMPLEMENTATION

- Technology Map
- Capacities Map
- Setup of SETIS

- Roadmaps
- Investment Gap
- Website

- Monitoring and Review
- Impact Analysis

EC Communication "Towards a comprehensive climate change agreement in Copenhagen" (2009)

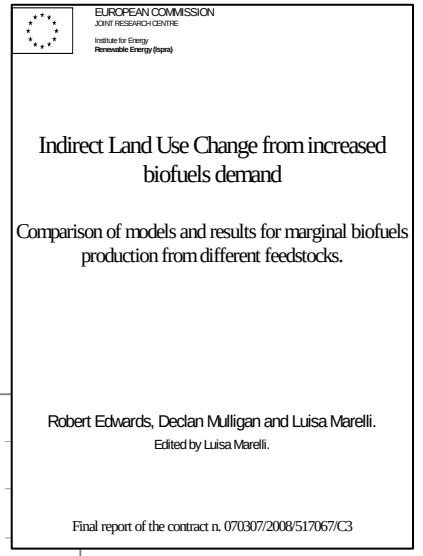


The JRC input was used to analyse the impact of the emission reduction scenario with respect to the baseline

[MtCO2eq]

Source: JRC, POLES

The JRC final report on the assessment of Indirect Land-Use Change (ILUC) was required by EP and Council for the Implementation of the Renewable Energy Directive (December 2010).

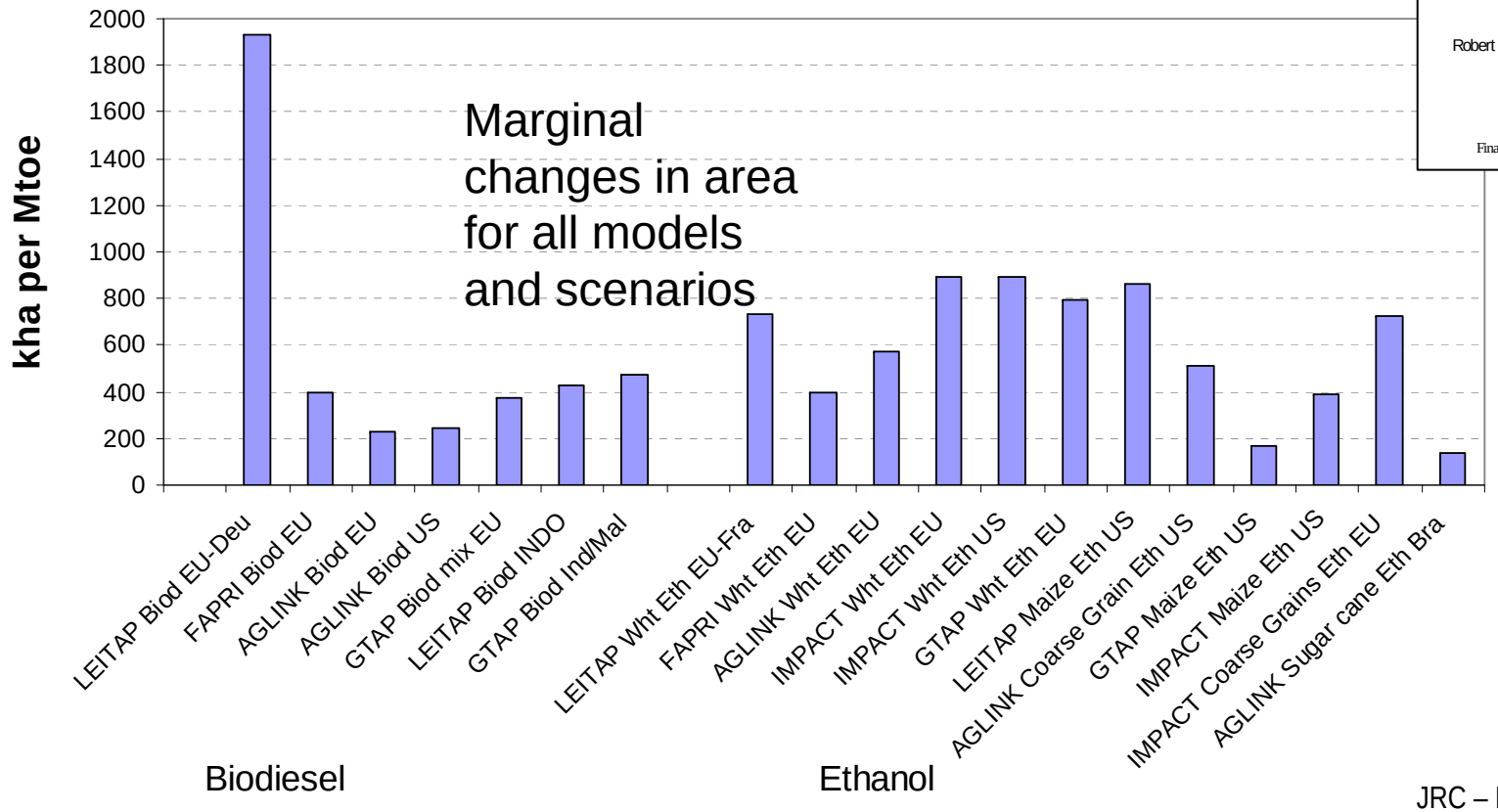

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE
Institute for Energy
Renewable Energy (Ispra)

Indirect Land Use Change from increased biofuels demand

Comparison of models and results for marginal biofuels production from different feedstocks.

Robert Edwards, Declan Mulligan and Luisa Marelli.
Edited by Luisa Marelli.

Final report of the contract n. 070307/2008/517067/C3

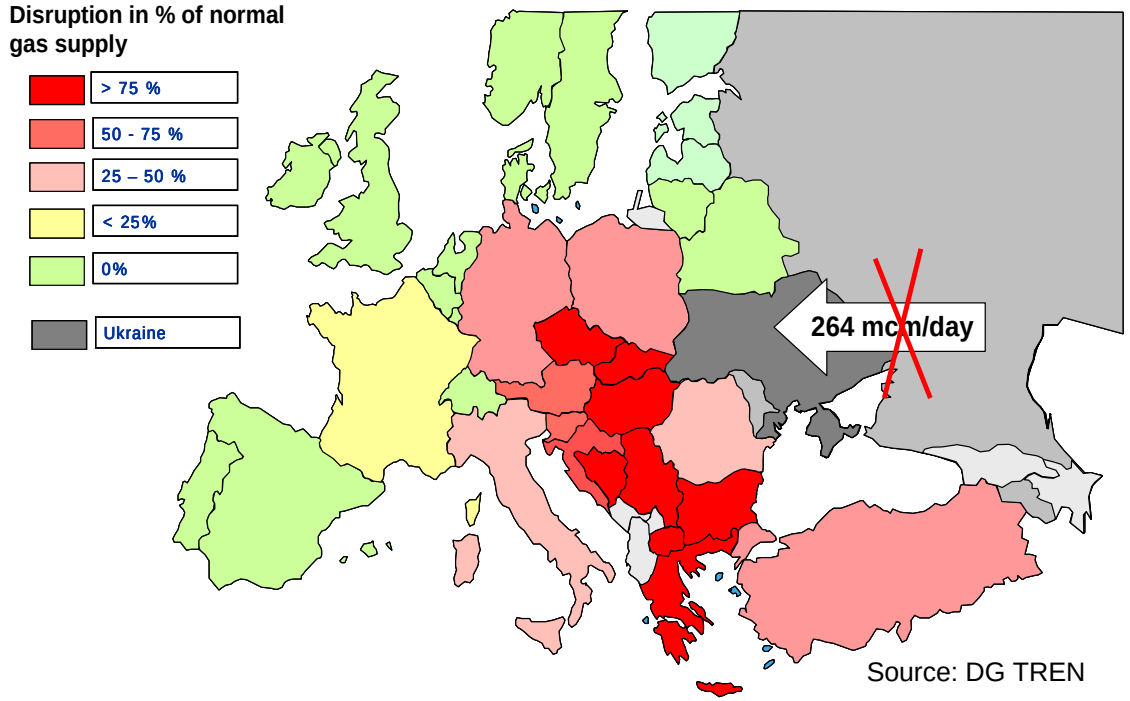


Directive 2004/67 on security of gas supply

After the January 2009 gas dispute between Russia and Ukraine, which resulted in gas disruptions throughout the EU, the EC started the revision of the **Directive 2004/67** on measures concerning the security of gas supply and an impact assessment was also launched

JRC staff worked closely with DG ENER to run a gas model (MC-Genercis). The effort resulted in the inclusion of the model and its results in the Annex 3 of the **Impact Assessment of the revision of Directive**.

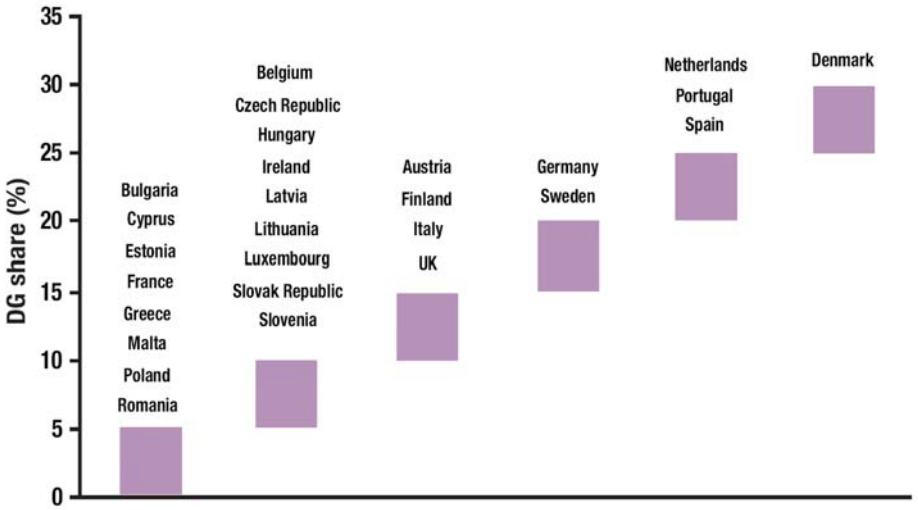
The model will be further developed upon request of DG ENER

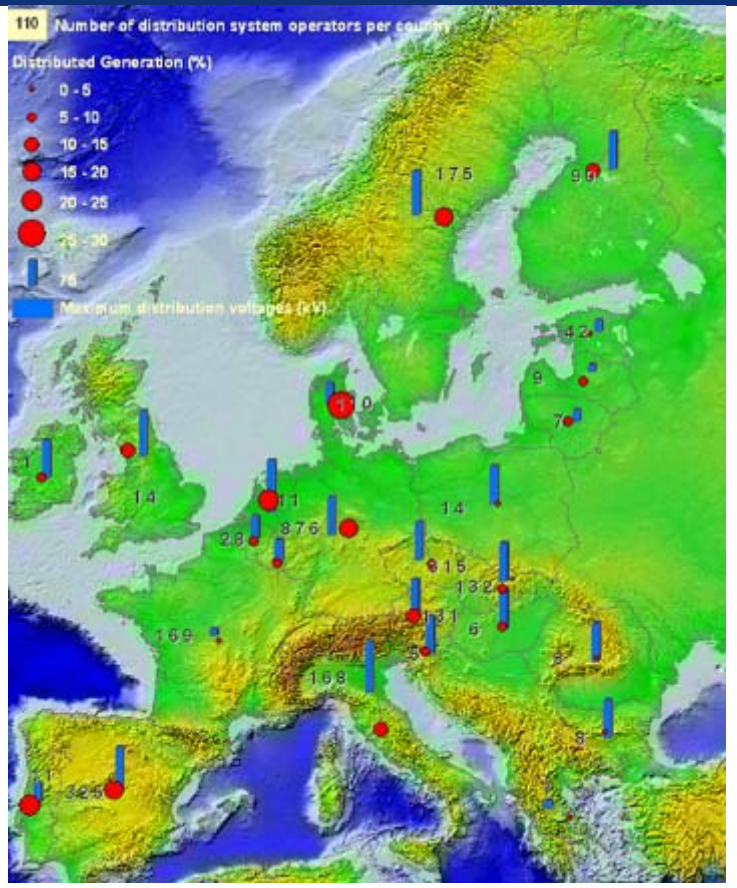


Source: DG TREN

Towards smart grids

JRC contributed to a DG INFSO Report on Information and Communication Technology and Smart Grids with original data and analyses on the impact of distributed generation. This fed into the **Communication COM(2009) 111 on ICT** for an energy-efficient, low-carbon economy.





EU-US Energy council :

the JRC session on smart grids at AAAS has been acknowledged as the first achievement of the Smart Grids SubGroup

JRC Report - 2009

The evolution of the Policy Context (Lisbon Treaty, December 2009)

Europe 2020 Strategy (March 2010) → Smart/Sustainable/Inclusive Growth

Flagship Initiative "Resource-efficient Europe" → To decouple growth/energy & resource use

Towards an energy strategy for Europe 2011-2020 (DG ENER)

→ Towards a new Action Plan (spring Council 2011)

Roadmap for low carbon energy system by 2050 (DG ENER)

→ 80-95% CO_2 reduction (2050)

Transport Whitepaper (2010-2020) (DG MOVE)

→ Decarbonisation of Transport as one main priority

Beyond 20% CO_2 reduction by 2020 (DG CLIMA)

The new JRC strategy: Development of a Low Carbon Society (LCS)

DG ENERGY (MoU)
DG MOVE (MoU)
DG CLIMA (MoU)
DG AIDCO (MoU)

EU Services
Parliament, Council

DG ENV
DG DEV
DG ENTR
DG JLS
DG RTD

Thematic Area LCS

The strategic goal is to work with the policy DG's in designing and implementing the EU's transition towards a secure and Low-Carbon Society, by being the in-house EC provider of technological, economic & environmental performance outlooks at EU/Global level and of quantitative impact assessments of EC policy initiatives

Institute for Energy

Institute for Prospective Technological Studies

Institute for Environment and Sustainability

The new JRC Strategy: Thematic Area Development of a Low Carbon Society

Key orientations in this Thematic Area:

Energy
- growth/innovation,
- environmental stewardship
- security of supply.

SETIS
SET - Plan

Transport
- Sustainable, safe and secure mobility of persons and goods
- Monitor and assess innovations
- Intelligent transport systems

Transport Competence Centre (STTP)

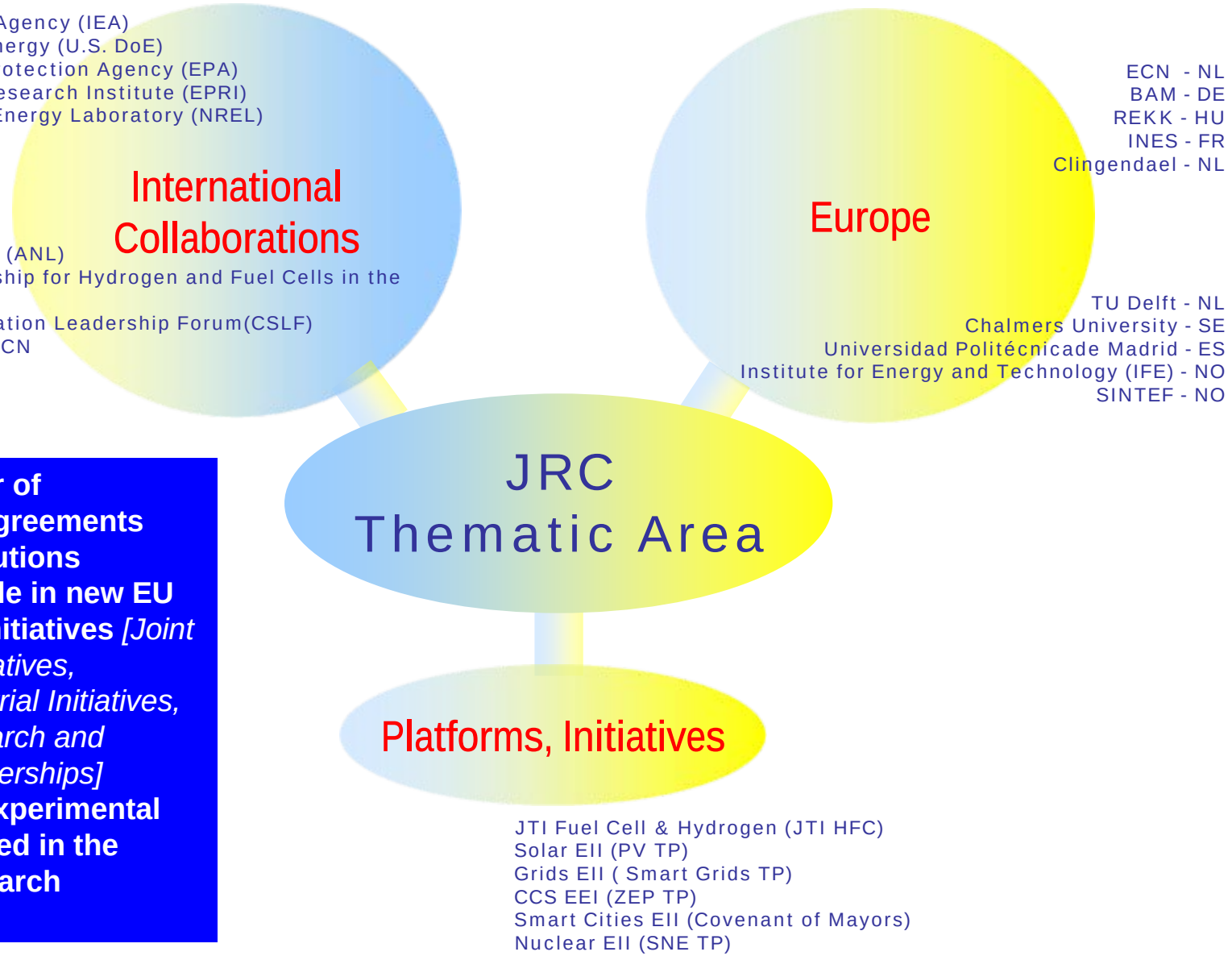
Sustainable Production & Consumption
- Efficient manufacturing technologies & production systems

New Bureaus

Climate Change Mitigation

Climate Change Modelling Platform

Strategic collaborations



- **Limited number of collaboration agreements with peer institutions**
- **Position and role in new EU instruments / initiatives** *[Joint Technology Initiatives, European Industrial Initiatives, European Research and Innovation Partnerships]*
- **Link to ERA - experimental facilities included in the European Research Infrastructure**

Conclusions (2): Modelling

Diverse modelling landscape feeds into Commission's decision making

⇒ **consistency, 'black box' effects**

Commission's ambition to internalise necessary modelling capacities and to develop new capacities in the context of the policies and services related:

- **ENER: 2050 Energy Decarbonisation Roadmapping, Renewable Policies**
- **MOVE: Transport White Paper**
- **CLIMA: UNFCCC negotiations, implementation of EU Effort Sharing Decision, ETS development**

⇒ **JRC is the preferred choice by the Services**

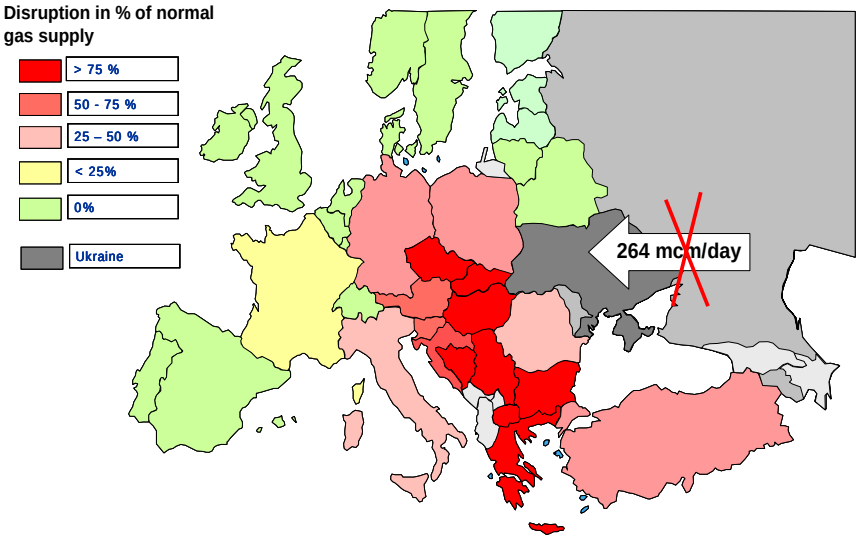
⇒ **The increased resources and integrated efforts through TA-LCS are required to:**

- **Enrich mainstream techno-economic modelling capacities at its disposal:**
  - Energy sector
  - Transport sector
  - Multisectoral analysis
- **Create an integration interface for key models (Platforms)**
- **Develop capacities on:**
  - Grids modelling
  - Future Energy Networks & Infrastructure Planning
  - Energy Technology Innovation modelling

Conclusions: TA-LCS evolution

To support the new Commission's integrated approach towards a Low Carbon Society the JRC needs acquiring/strengthening competences and resources (besides modeling and analysis) also in other areas:

- Energy security (distribution + resources)
- Energy storage
- Energy efficiency
- Electrification of transport
- Intelligent transport system (ITS)
- Operational support (Information System, Bureaus)



Research infrastructures will be maintained for selected LC technologies in order to play the role of:

- Reference function (PV, road transport, H2/FC)
- Pre-normative research (nano-materials, 3rd generation [3G+] biofuels)

Thank you for your attention.

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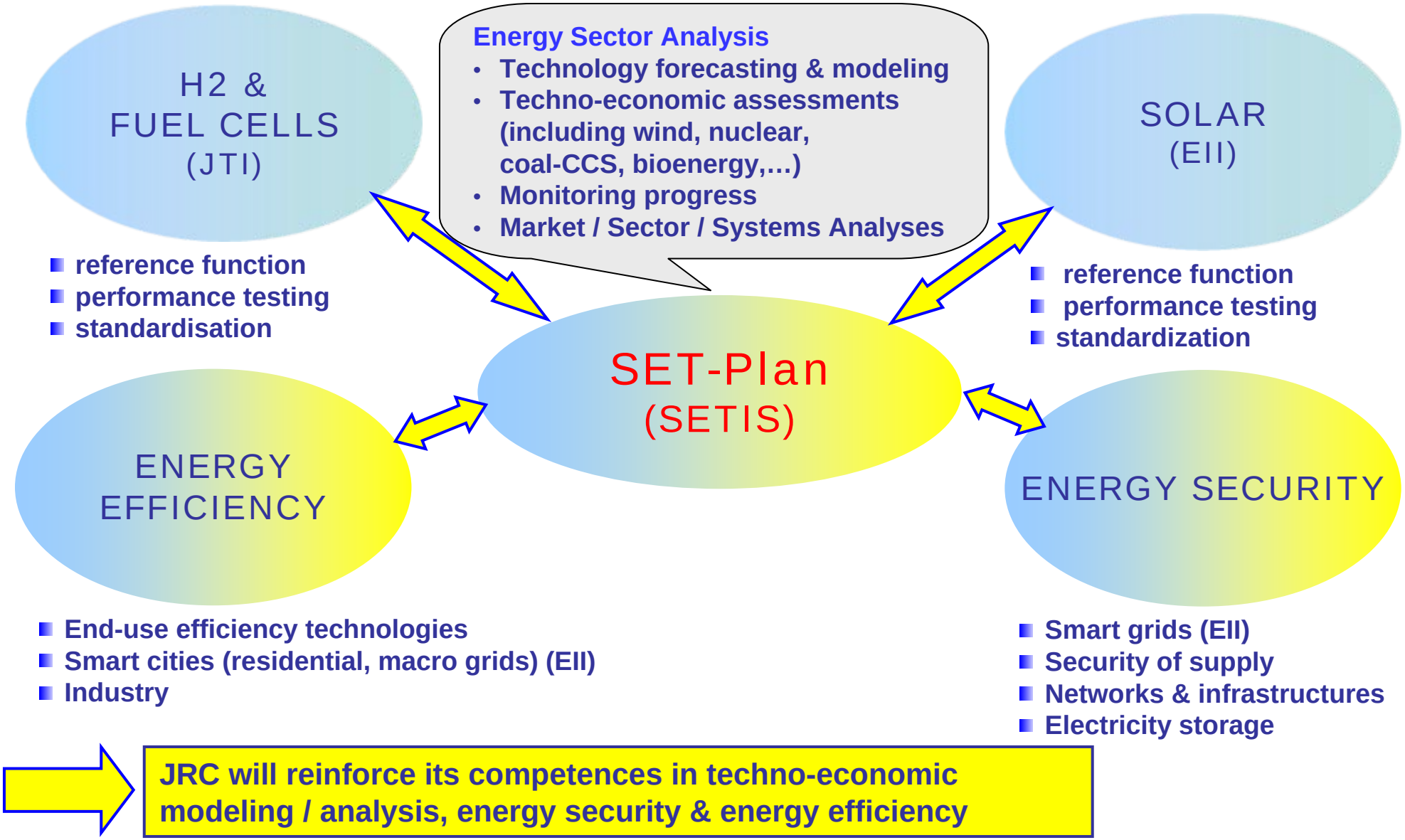
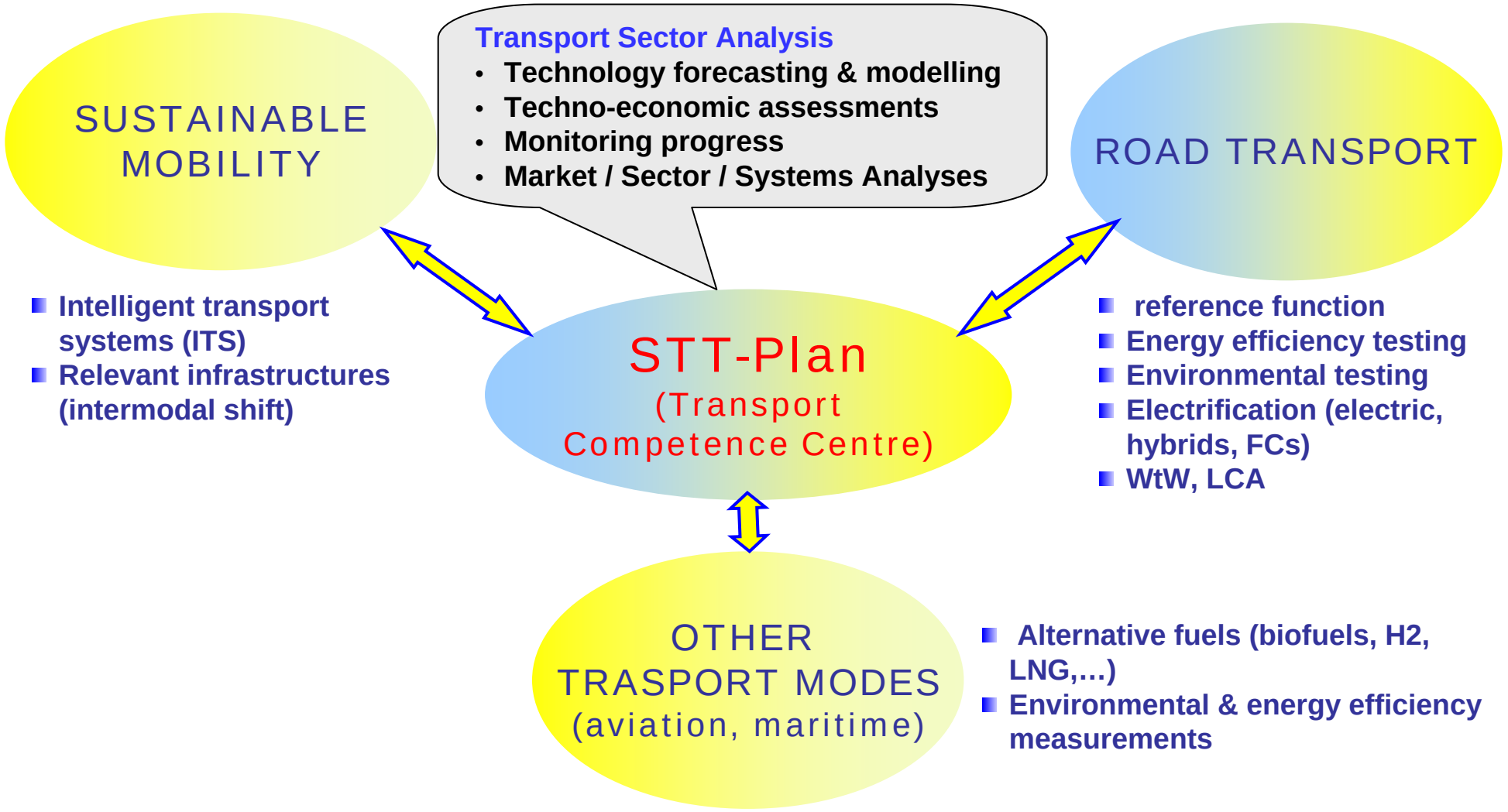
TA-LCS: the way forward - Energy

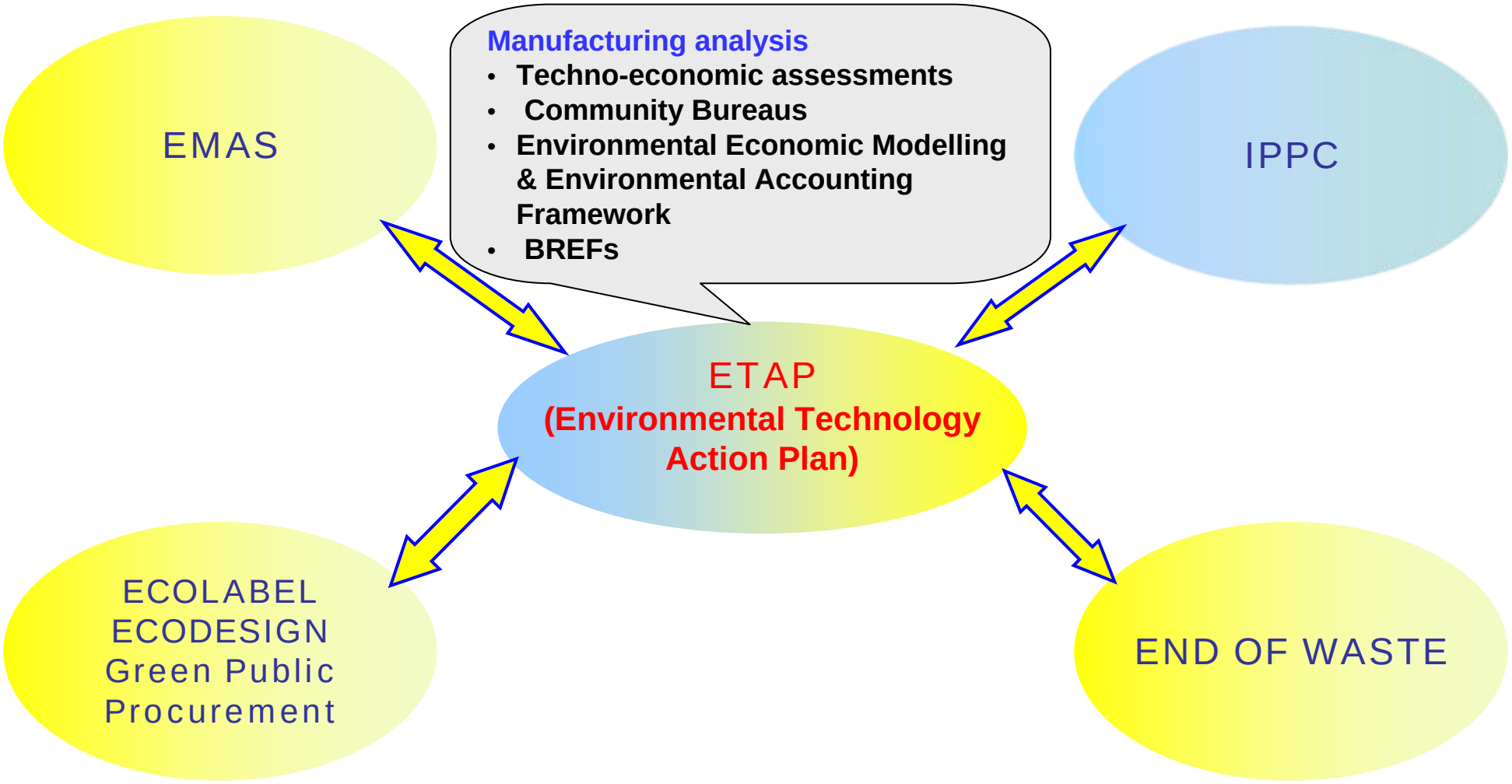


TA-LCS: the way forward - Transport



JRC will reinforce its competences in techno-economic modelling / analysis of electrification of transport, ITS & LCA of alternative fuels

TA-LCS: the way forward -
Sustainable Production & Consumption & Industrial Policy



JRC will manage new bureaus

TA-LCS: the way forward -
Climate Change Mitigation

DG ENER, ENV, MOVE, CLIMA, ENTR

Integrated Modeling Platform

Technology/Infrastructure/Subsector Modelling

Energy | Transport | Industry | Building | Agriculture | Spatial planning

Sector activity Modelling

POLES TIMES | TREMOVE TRANSTOOL | SENSIM, ALUSIM, etc | | e.g. CAPRI | e.g. MOLAND

Emissions projections

POLES/EDGAR

e.g. MOLAND, Soil and Forest Data Centre, Global Land Cover 2000

Global and Regional Climate Models

ECHAM5/CLM

Inputs Policies Resources Macro-Socio economics Link to TA 1 and TA 3

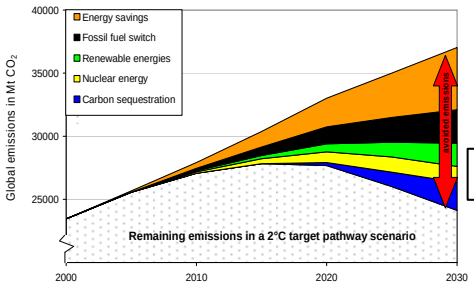
Output: Sector Activity projections

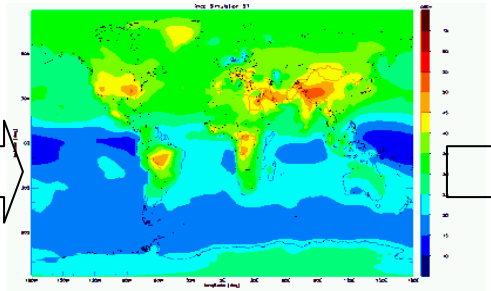
Output: Geographic Emission & Land Use Scenarios, Sectoral Mitigation Costs

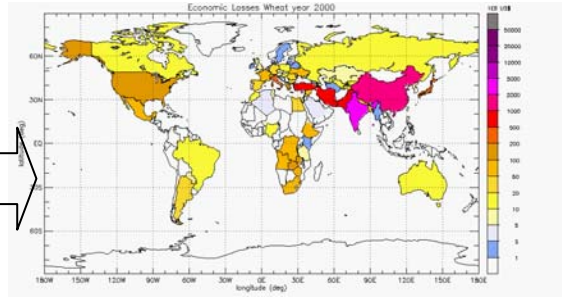
Output: 2˚C target

Inputs to TA 1 and TA 3 for Macro-economic analysis, Damage Assessment Adaptation Assessment etc.

Climate Change Modeling Platform







scenarios of energy market
+
CC policies

CO_2 emissions

(POLES)
(EDGAR)

AP control technologies
+
AP policies

AP emissions

(GAINS)
(EDGAR)

present and future air pollution
&
climate

(TM5)
(ECHAM5)

impacts
&
economic costs

TA 2 **TA2+TA 3** **TA1+TA3**