

# JRC Support to the Development of an Energy Policy for Europe



*Institute for Energy*



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



- ✓ Challenges & Issues
- ✓ Energy Policy Developments
- ✓ Interlinks (e.g. climate change)
- ✓ Research & Innovation
- ✓ R&D - JRC - Institute for Energy
- ✓ Examples of activities, follow-up

## Energy for Europe



# Challenges ...

**Competitiveness**  
**“LISBON”**  
knowledge for growth



**BALANCED,**  
**REINFORCING**



**Sustainable Development**  
**“KYOTO”**



**Security of Supply**  
**“MOSCOW”**

# Energy Policy Development

*Green Paper 2000: Towards a European Strategy for the Security of Energy Supply*

Informal Hampton Court European Council 2005:  
request to EC for setting up Energy Policy for Europe (Oct. 2005)

**EC reply:**

*Green Paper March 2006:  
A European Strategy For Secure,  
Competitive & Sustainable Energy*



# Interlinks: Energy - climate change

## AN ENERGY POLICY FOR EUROPE

**Intimately linked**

**Energy production:**

- **80% of EU-GHG**
- **>90% of EU-CO<sub>2</sub>**



## Where to focus R&D effort

‘Pillars’ to address 21st century’s **energy & climate** challenges:

1. Increasing EU **energy efficiency**
2. Tripling **renewable energy** by 2020
3. More **clean hydrocarbons**
4. **Strengthening EU's carbon market**
5. Forging an open and **competitive** internal energy market



***President Barroso** at the World Energy Council's 20th World Energy Congress in Rome on 11-15 November 2007*

## AGREED key challenging targets ...

### AN ENERGY POLICY FOR EUROPE

**By 2020 – 3 x 20s:**

- **20% reduction in GHG emissions (REF.1990)**  
(30% if global agreement)
- **20% reduction in primary energy use**  
(through energy efficiency)
- **20% of renewable energy in the EU's overall mix**  
(minimum target for renewables of 10% of vehicle fuel)

*By 2050 : indicative 60 to 80% reduction in GHG*

# JRC Activities in the Energy Portfolio

- Interlinks
- Scenarios & modelling
- Social economic studies

- Nuclear safety
- H<sub>2</sub> & Fuel Cells
- Bio-energy
- Clean fossil Tech.
- Modelling
- Energy Security

- Renewables
- Efficiency (fuel, buildings, appliances, Well-to-wheel ...)



**Resources: ca 320 staff**

# JRC – Institute for Energy

- **Hydrogen and fuel cells (FCH)**
- **Zero emission power plants (CCS)**
- **Renewables (PV, Solar)**
- **Biofuels (2<sup>nd</sup> Generation)**
- **Next generation nuclear reactors**
- **Energy efficiency (transport, buildings, etc.)**

**SET Plan**

- **Energy systems modelling**
- **Energy security**

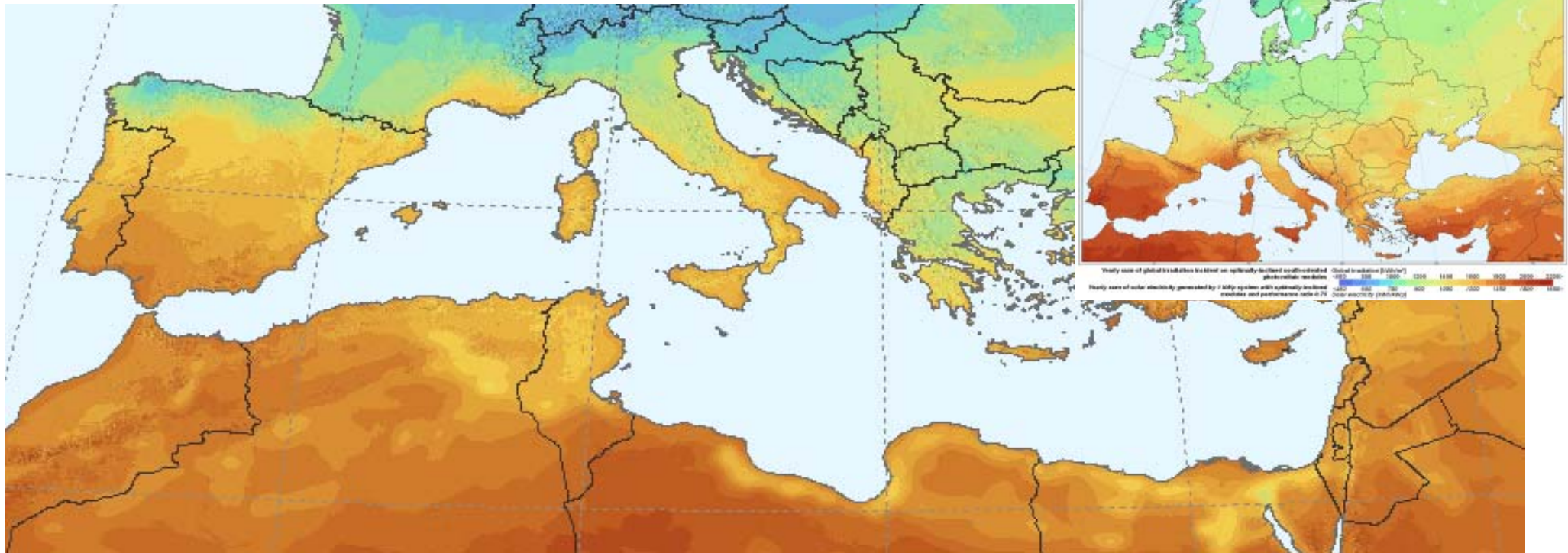
**Energy  
Observatory**

- **Current generation nuclear reactors**

**Clearing House**

**+  
International Cooperation**

# Photovoltaic Solar Electricity



- PV-GIS : **Solar Resources**
- Compiled by JRC (satellite & land measurements)
- Cumulative **capacity** in EU Member States

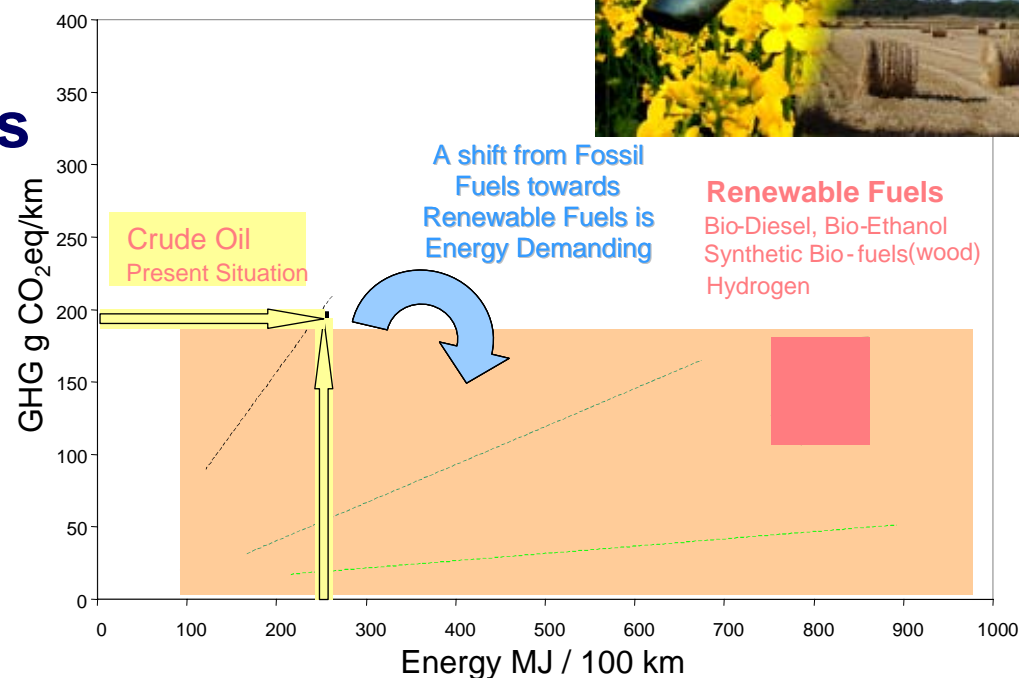
## Photovoltaic Solar Electricity

- Performance
- Calibration Standards
- ESTI calibrates 60% of products in global markets
- Remove International Trade Barriers; fair markets
- Chairman IEC TC82 Solar PV, IEC standards (42 MS)



# Biofuels: Well-To-Wheel Analysis

- WTW Analysis: Fuel/Vehicle
- Present & future combinations
- JRC/EUCAR/CONCAWE
- GHG emissions
- Consumption & Costs



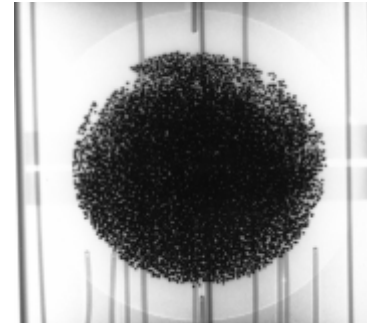
## Impact:

- Commission DGs (TREN, AGRI, ENV, RTD, ECFIN)
- EP, Member States, IEA, EEA - Industry (ENGVA, eBio, EBB,...)

The report is available online: <http://ies.jrc.ec.europa.eu/WTW>

## GEN IV Nuclear Reactors

- **GEN IV support**
- **High performance**
- **High burn-up**
- **High Temperature**
- **Very High Temperature Reactor (VHTR)**
- **Electricity + Technological Heat**
  - **Hydrogen production**
- **Super Critical Water Reactor (SCWR)**



***JRC: Implementing Agent for EURATOM***

## Hydrogen & Fuel Cell technology



- **Safety & performance assessment of hydrogen storage**
- **Gaseous & solid state – fast filling, cycling, permeation, etc.**
- **Performance testing of fuel cells**
- **Reference function in the H<sub>2</sub> FC JTI**

## Energy Security

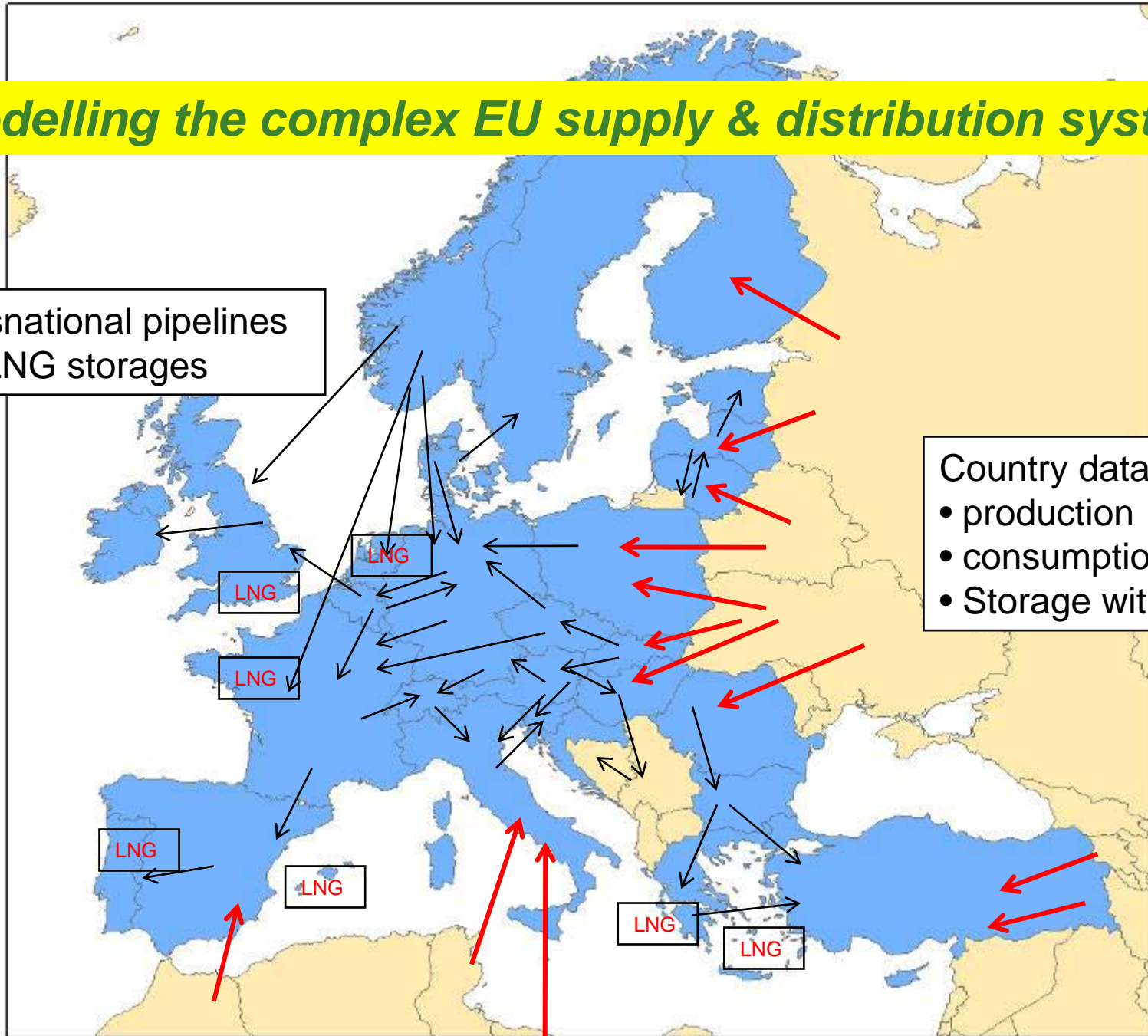
- **Energy supply analysis**
- **Assessing/prioritising challenges & risks**
- **LNG supply chains**
- **Databases**
- **Methodologies** for hazards identification
- **Potential impacts** on EU system



- **Energy Observatory**
- **Improving the resilience of networks**

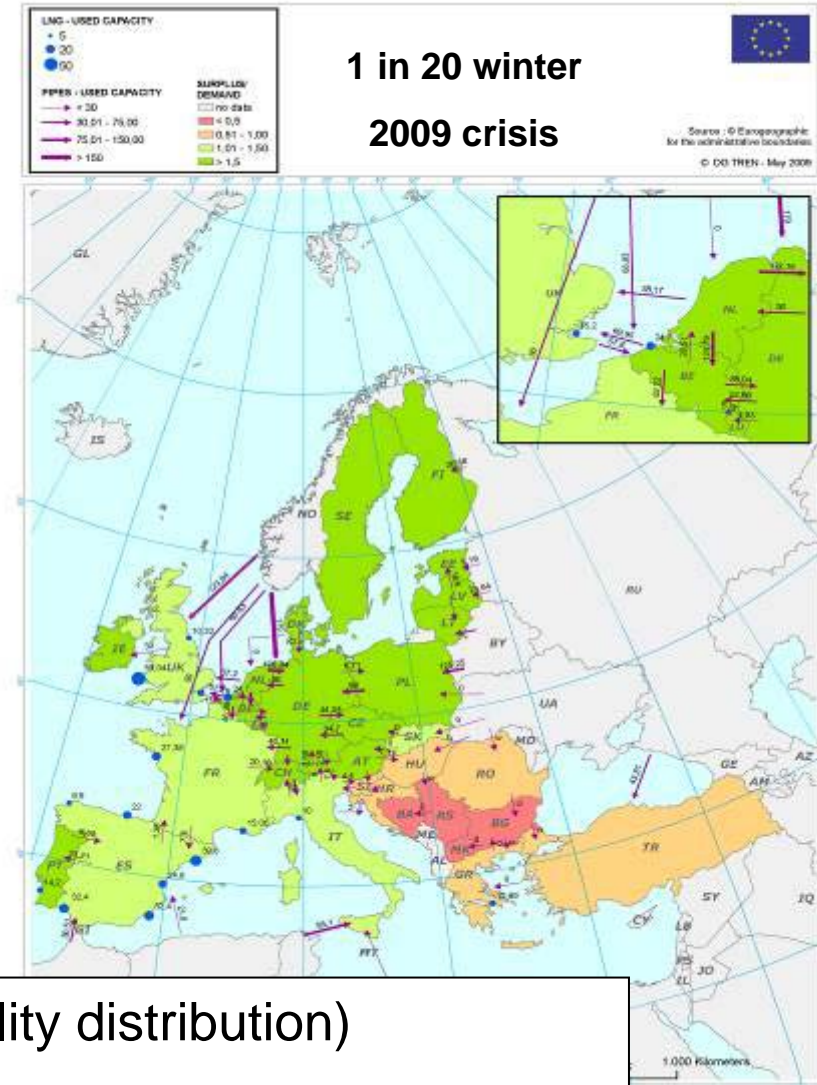
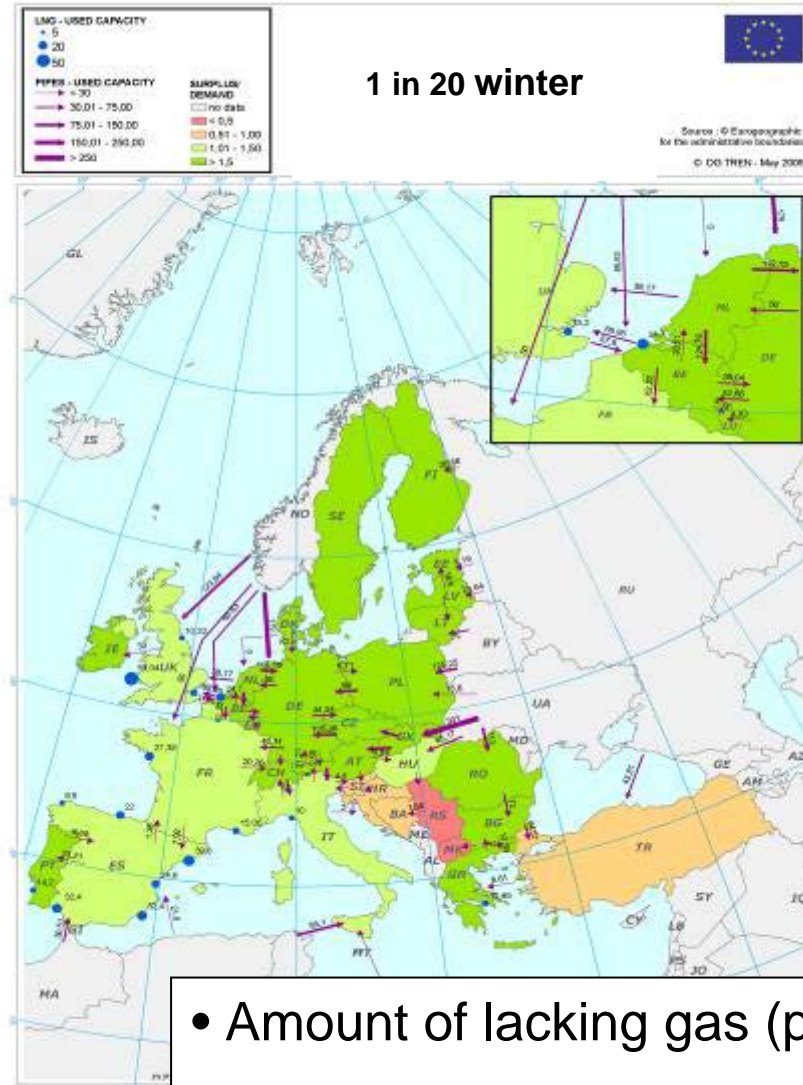
# Modelling the complex EU supply & distribution system

85 transnational pipelines  
9 LNG storages



Country data for:

- production
- consumption
- Storage withdrawal pot.



- Amount of lacking gas (probability distribution)
- Workload on pipelines (probability distribution)

# Future focus of JRC in the Energy Landscape

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**Thank-you**

**Together we can keep the lights on**