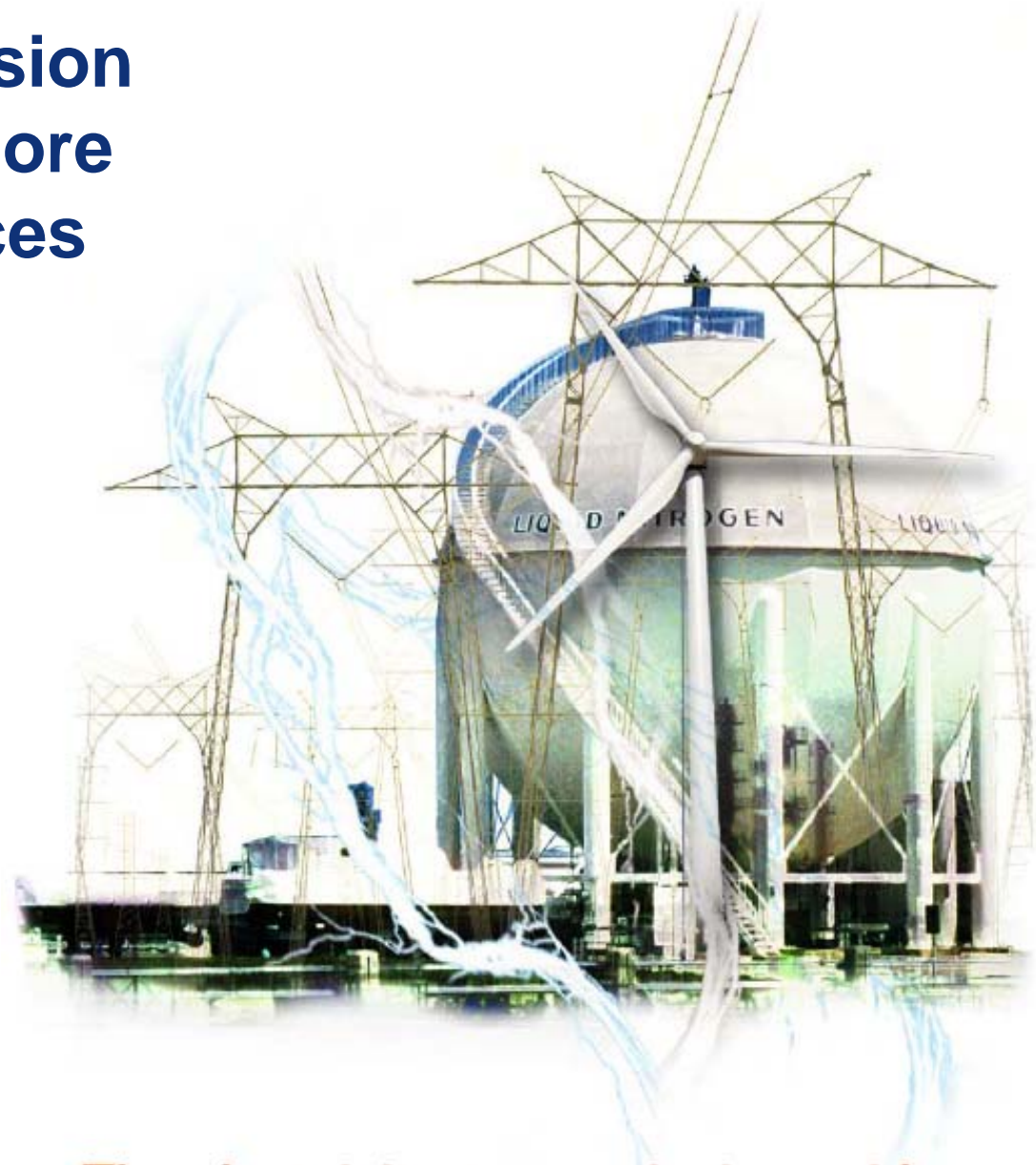


# The electricity transmission grid: how to integrate more renewable energy sources

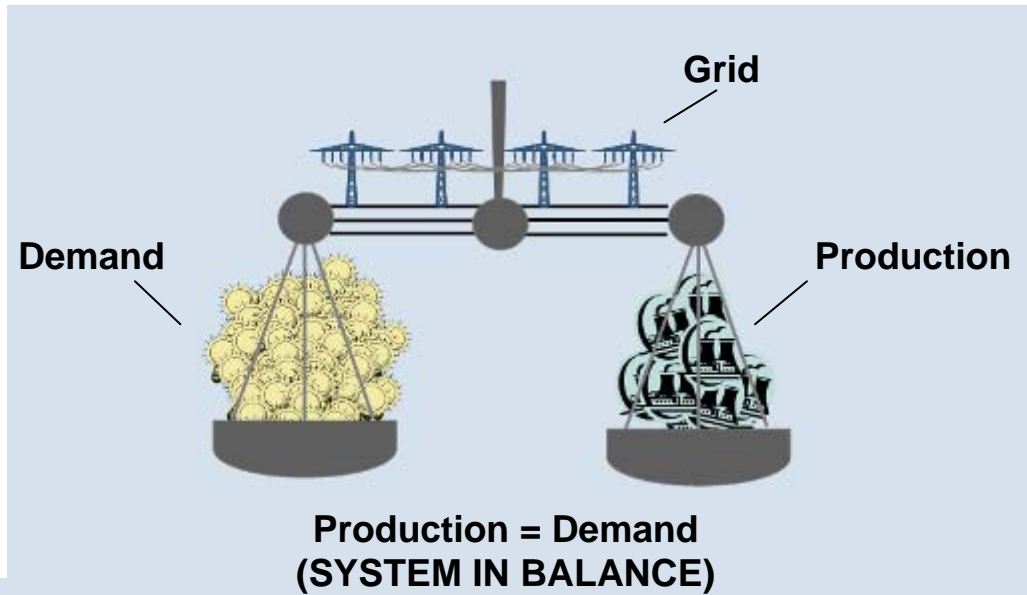
Organiser: Gianluca Fulli

Moderator: Arnulf Jaeger Waldau

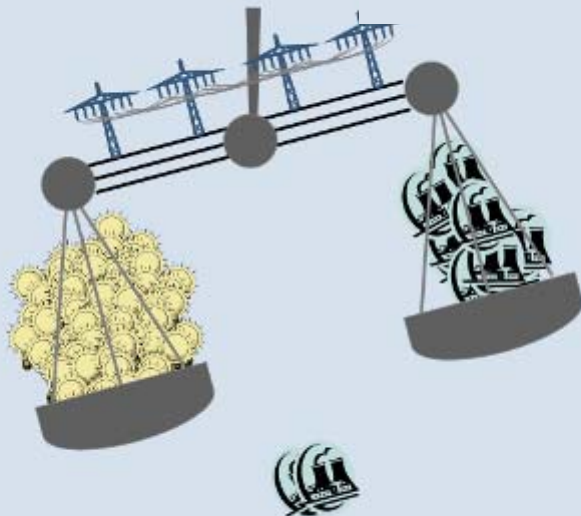
*European Commission  
Joint Research Centre  
Institute for Energy*



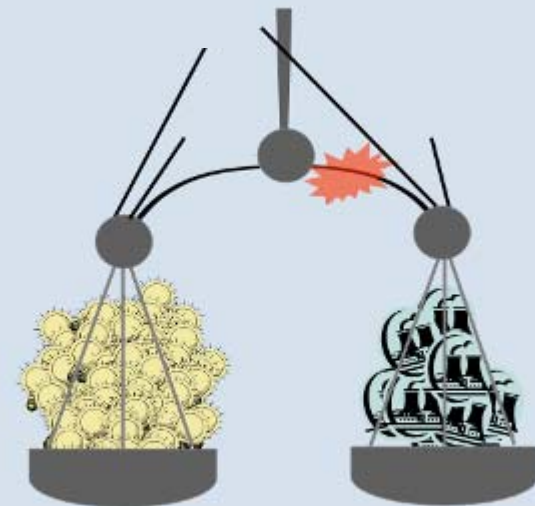
# Grid makes Production and Demand meet



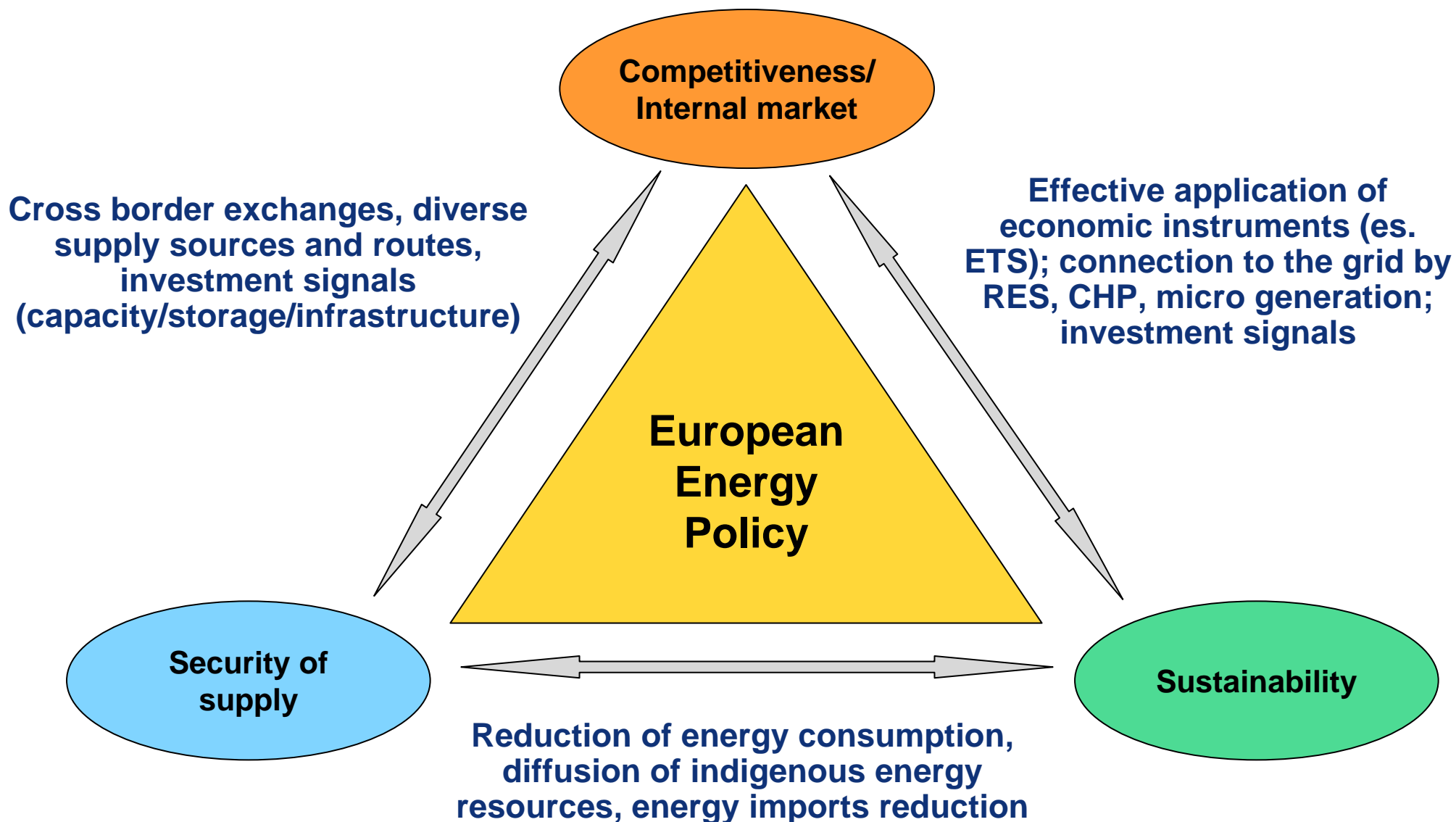
(Source: APG Verbund)



lack of Production (INSTABILITY!)



Production = Demand but Grid is weak (INSTABILITY!)



The 20-20-20 Energy and Climate package requires the EU, by 2020, to

- reduce its GHG emissions by 20% - 20%
- increase the share of renewables in energy consumption to 20% +20%
- save 20% of total primary energy consumption compared to baseline - 20%



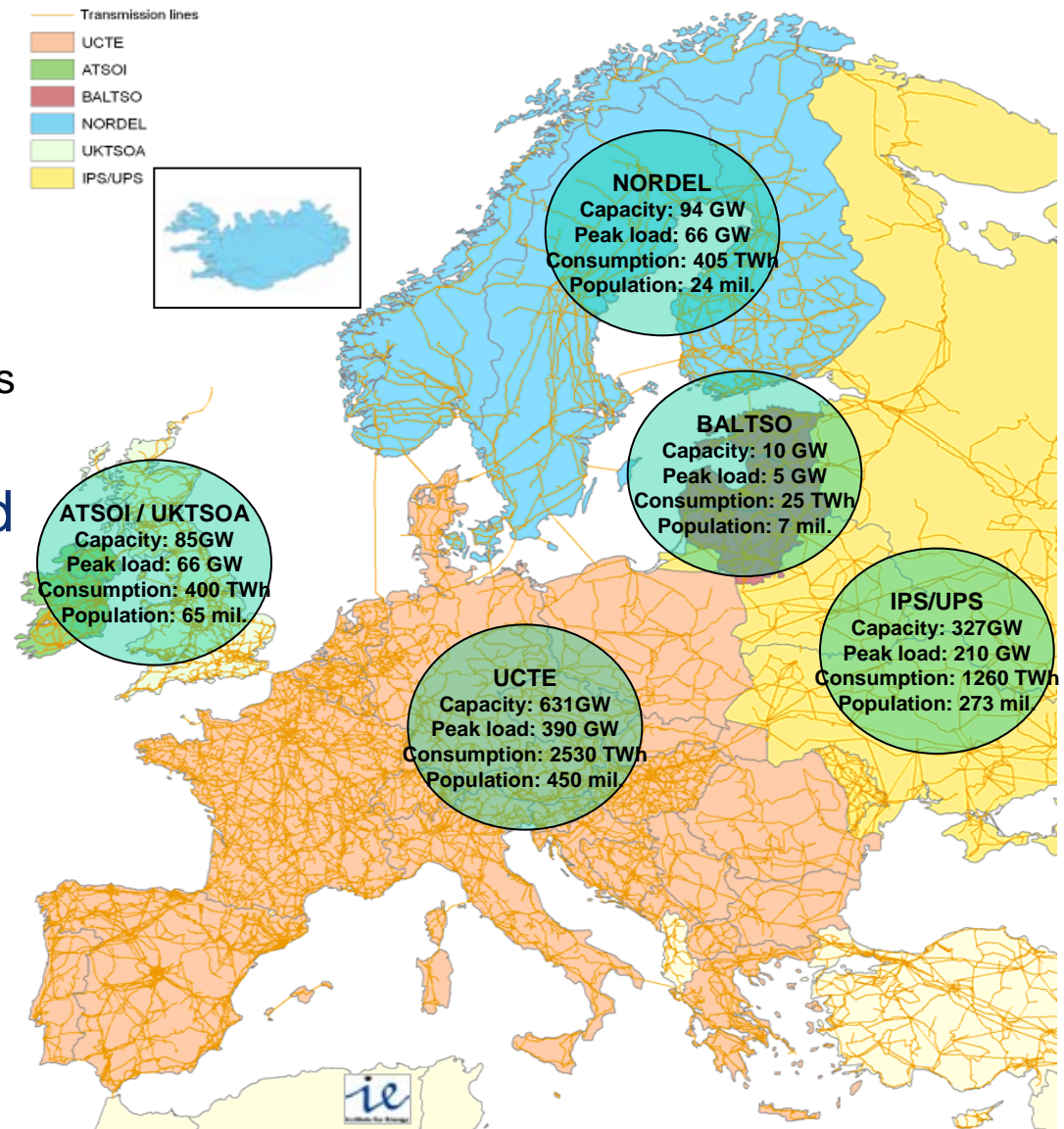
From regulated structure (with vertically integrated utilities) to competitive markets

- cross-border trade facilitation
- more recurrent and changing congestions

High RES deployment ongoing and further expected (esp. wind )

- connected RES have to be reliably integrated in the European system

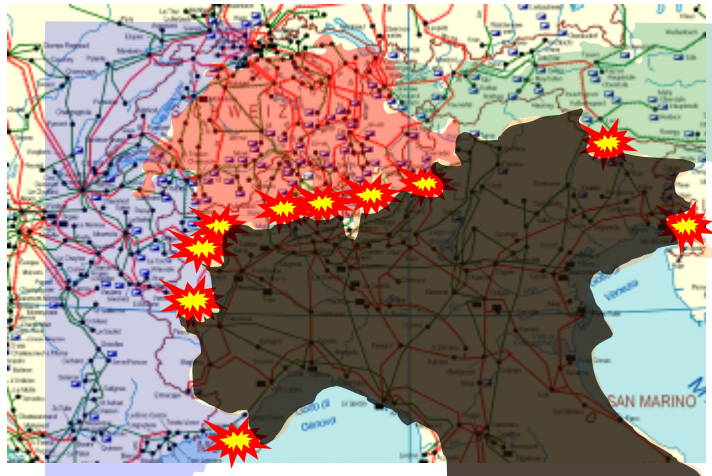
Security of electricity supply and environmental drivers impact on the system development



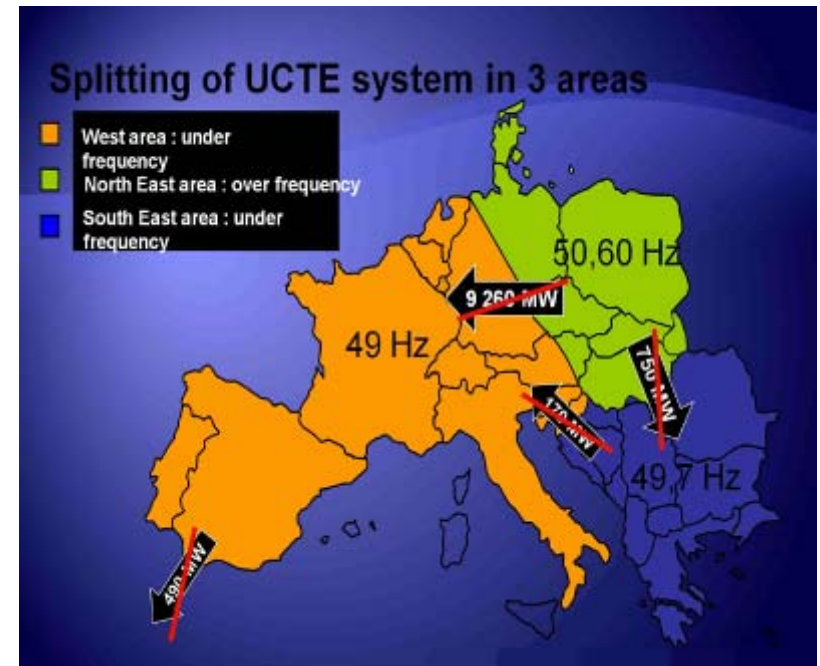
## Blackout in USA 14.08.2003



## Blackout in Italy 28.09.2003



## Grid disturbance in Europe 04.11.2006



- The energy networks must be modernised to allow Europe to meet its energy policy goals, including the 20/20/20 targets
- Networks need to become:
  - more Europe-wide, to enable the internal energy market, to strengthen security of supply and allow new technologies deployment
  - flexible, to allow a variety of renewable sources, more decentralised power generation, incorporating smart energy demand technologies
- **The Joint Research Centre of the European Commission** performs research and supports EC's policies and initiatives on energy networks and smart grids

## **Nicholas Dunlop**, e-Parliament Initiative

*How can legislators promote a shift to increasing renewable energy sources in the electricity grids?*

## **Jorge Vasconcelos**, Portuguese Energy Regulator

*How can Energy Regulation reconcile RES promotion with efficient electricity markets and infrastructure development?*

## **Gianluca Fulli**, European Commission - Joint Research Centre

*What role does High Voltage Direct Current play and what HVDC backbones or supergrids does Europe need?*

## **Maria Rosa Palacín**, Institut de Ciència de Materials de Barcelona

*What storage do we need to reach the targets?*



## Invitation

Scientific session:

# The electricity transmission grid: how to integrate more renewable energy sources

Tuesday, 6<sup>th</sup> July, 2010 – 10:30 to 11:45  
Lingotto, Room 2