

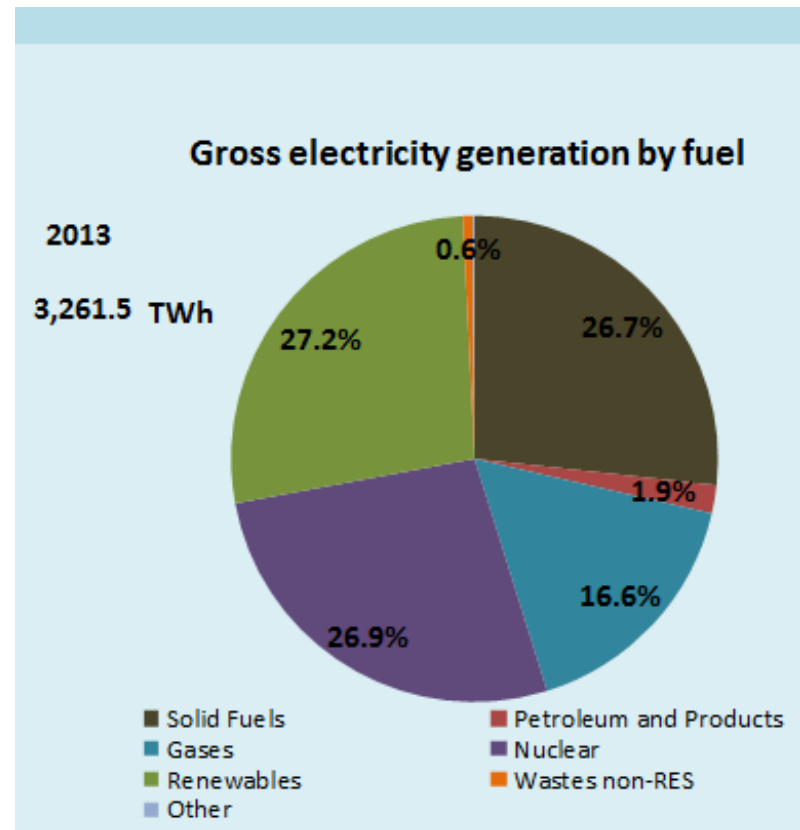
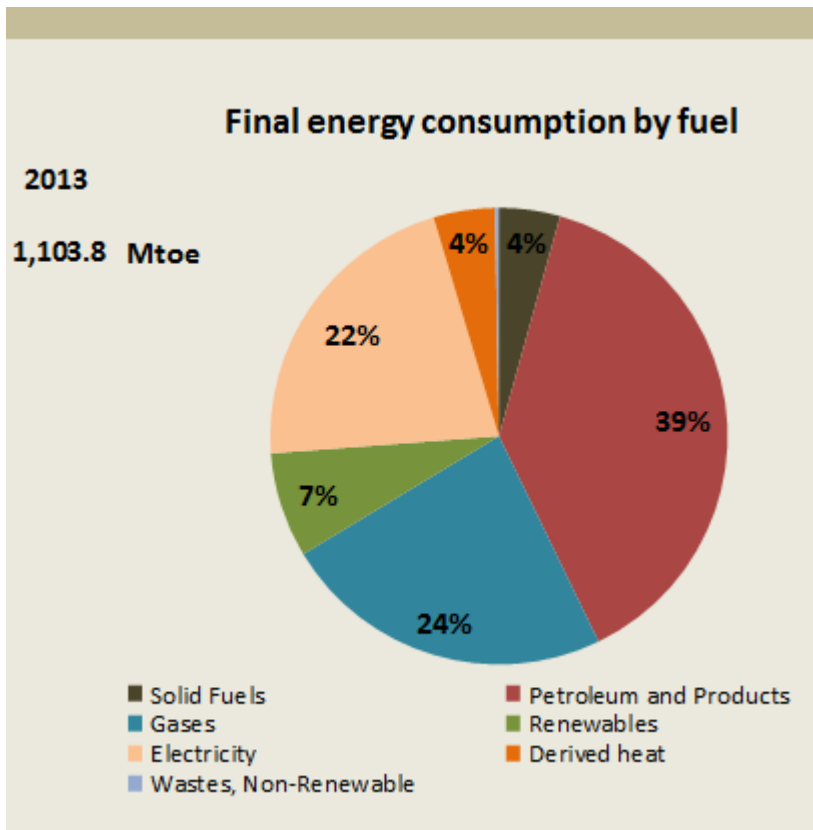


# **Innovating Gas For the New Energy System**

***Tudor Constantinescu, PhD  
Principal Adviser , European Commission – Energy***

***EGATEC conference  
Vienna, 25 November 2015***

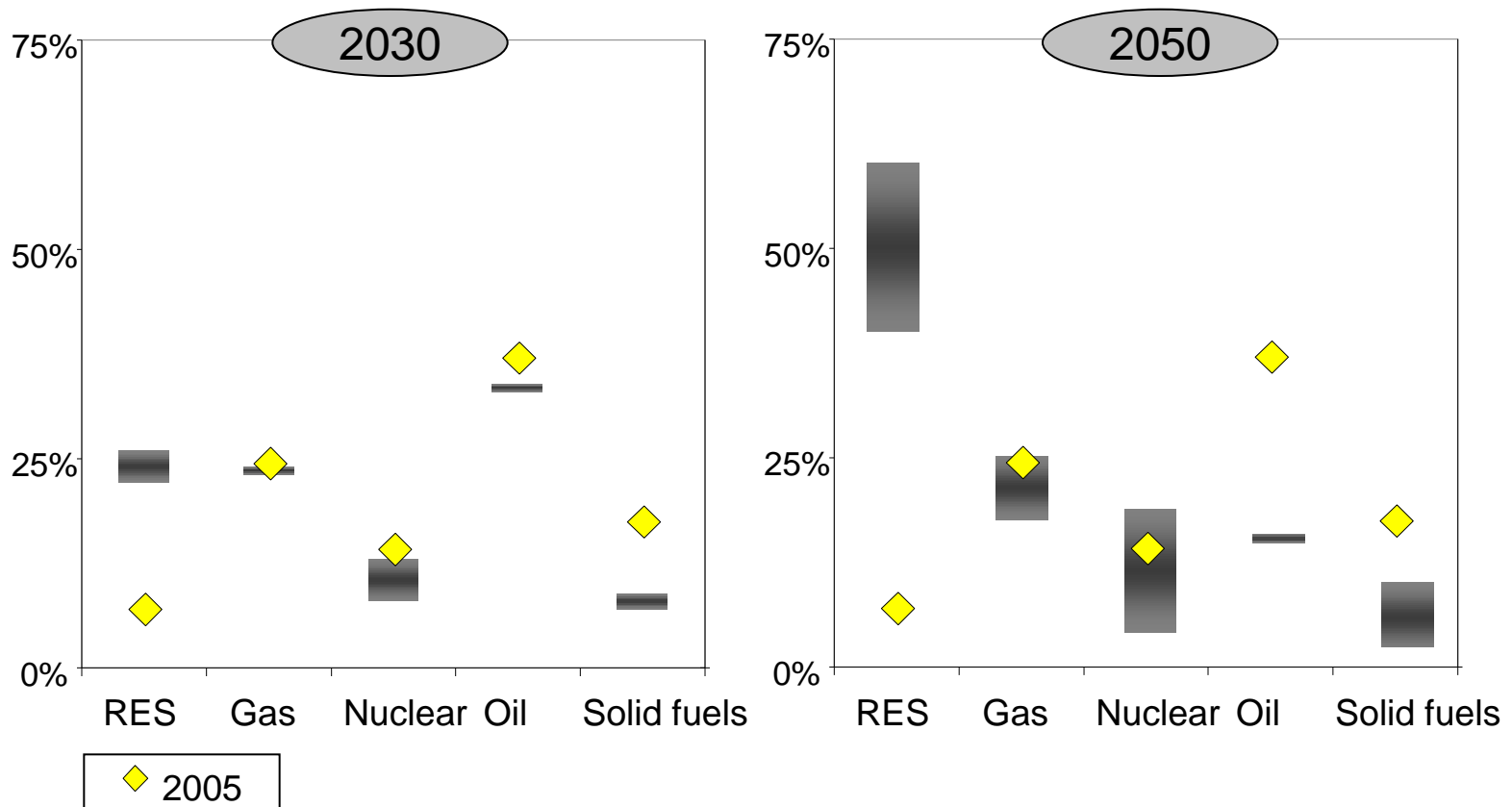
# EU energy mix



# Looking to the future – Energy Roadmap 2050

- Basis: 20/20/20 objectives of the EU energy policy
- Roadmap 2050: Cutting GHG emissions until 2050 down to 80 – 95 % below the level of 1990
- The Energy Roadmap 2050: the basis for the elaboration of a low carbon 2050 strategy
  - *Supported by multiple **scenario** analyses, to show how to reach the 80 % / 95 % goal while at the same meeting other policy objectives (Competitiveness and Security of Supply)*
  - *Containing robust assumptions for all possible scenarios*

# Fuel Ranges (primary energy consumption)



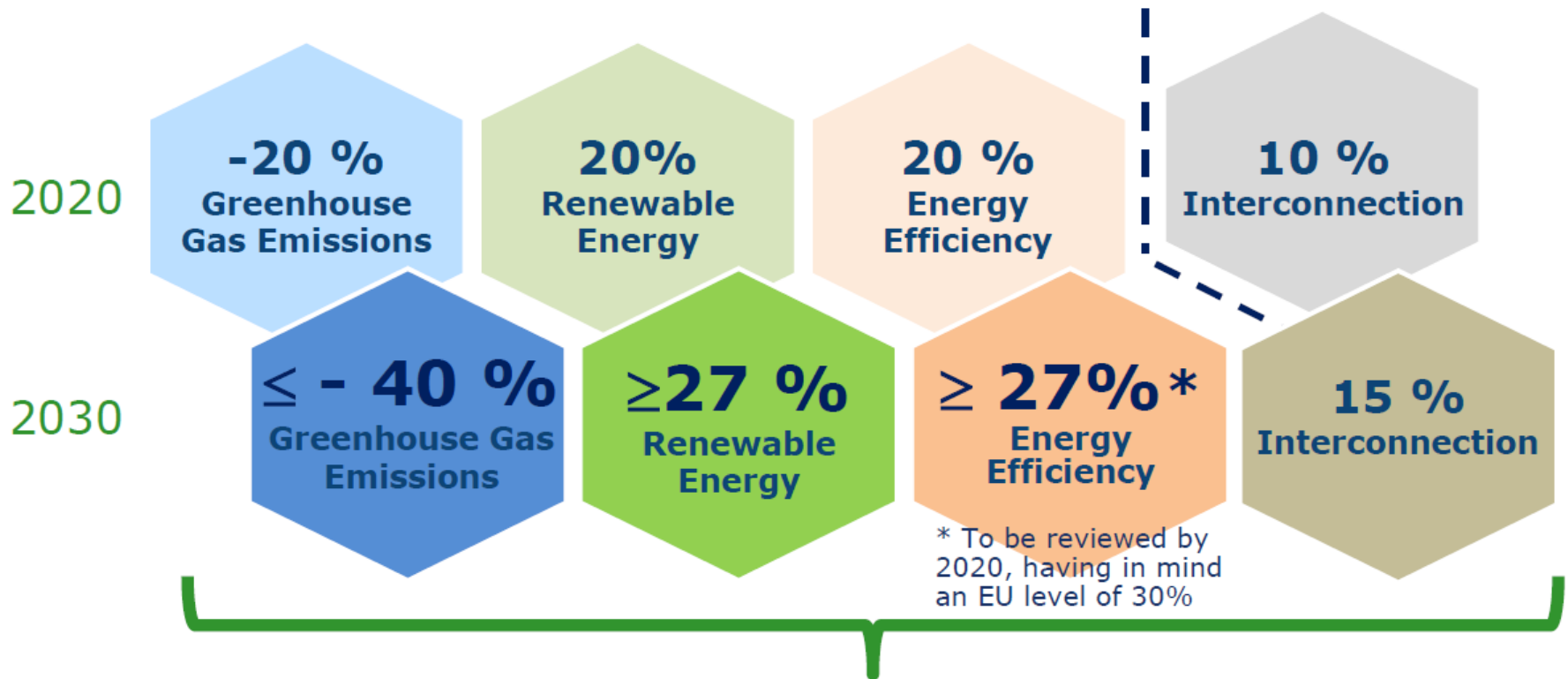
# Major energy challenges in Europe

- Import Dependency
- Energy Prices
- Decarbonisation
- Technology mix

# How to address energy challenges in Europe

- Complete the internal market and place consumers into focus
- Improve EE- attract investments, behaviour change
- Increase RES – lower technology costs, market integration measures, reform support schemes
- Make use of available energy resources, develop synergies between RES and fossil fuels (e.g. Power to Gas)
- Improve and develop infrastructure – interconnections, smart grids
- Diversify energy supplies and International cooperation (e.g. Energy Community, Eastern Partnership, Inogate)
- **Act on Technologies – Regulations – Financing - Cooperation**

# 2030 framework for climate and energy policies



**New governance system + indicators**

# The EU Energy Security Strategy

## Main messages:

Energy security is inseparable from 2030 climate and energy policy framework.

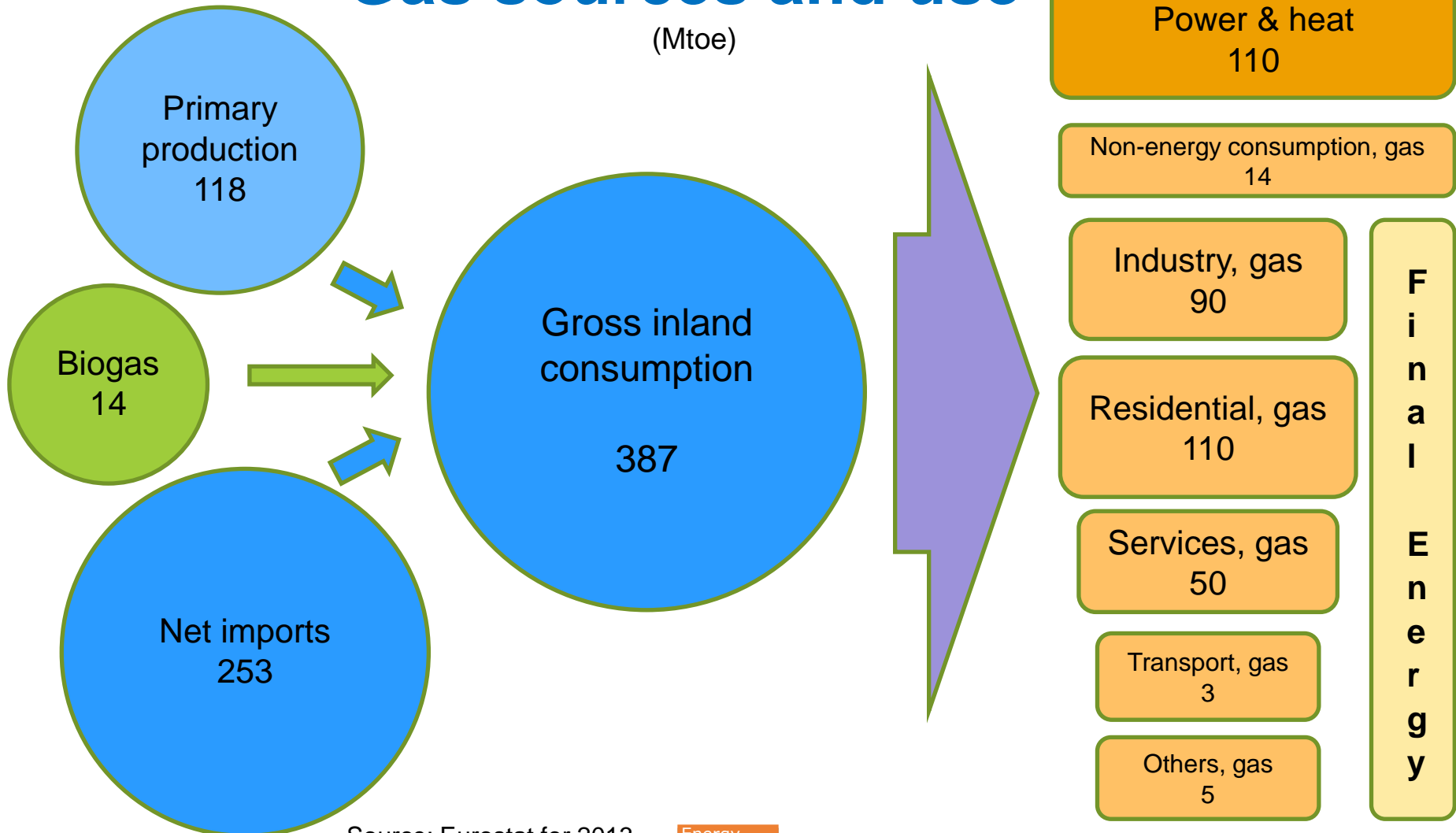
We need to act now to ensure supplies in short term and in the medium-long term:

Moderate energy demand	Increase sustainable energy production
Emergency and security mechanisms	Including our neighbours
More integrated energy market	Intensify our diversification efforts
Accelerate interconnections	Full use of EU financial instruments
Compliance of infrastructure projects	Coordination of national energy policies
Coherent external energy policy	Synergy with foreign policy instruments



# Gas sources and use

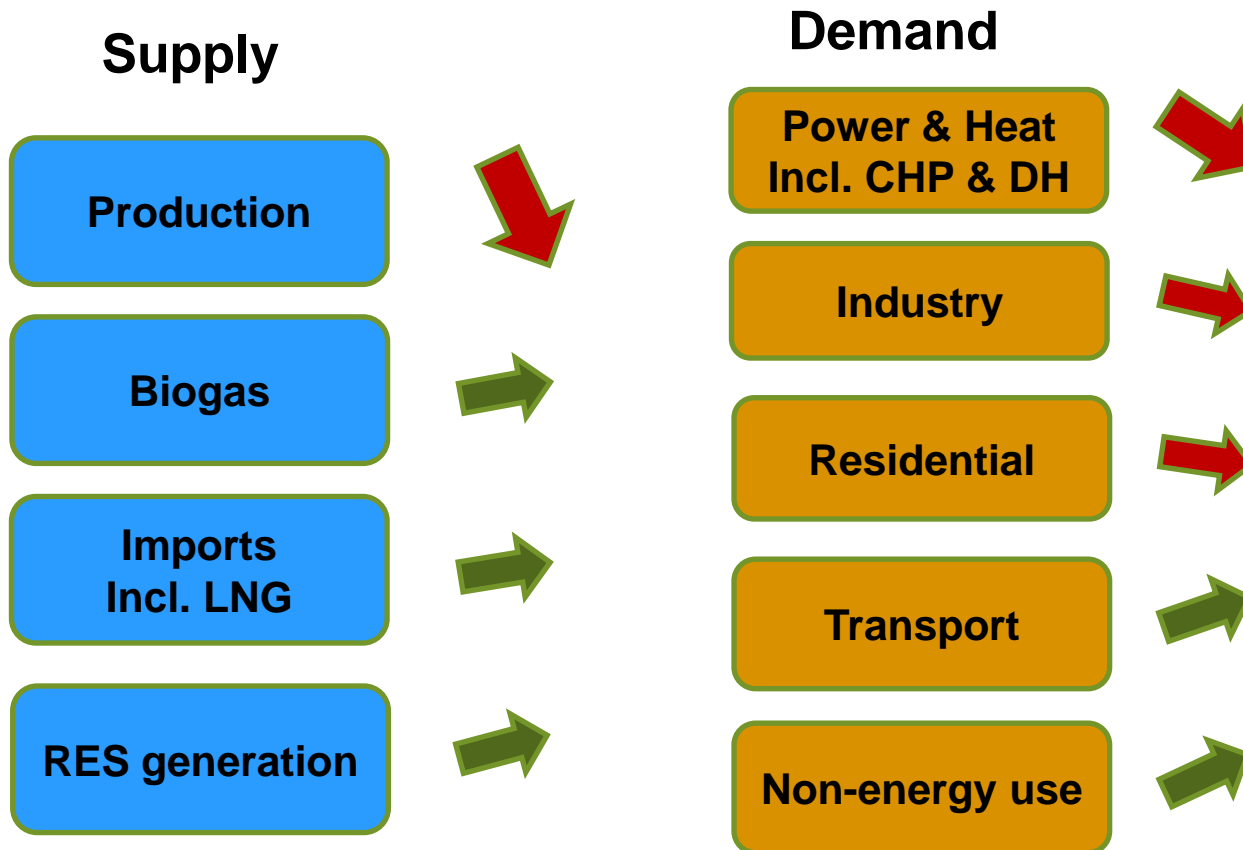
(Mtoe)



Source: Eurostat for 2013

Energy

# Trends towards 2030





# The way towards: **The Energy Union**

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**Where** we want to go:

**A secure, sustainable, competitive, affordable energy for every European**

**How** we want to reach it:

**5**  
GUIDING  
DIMENSIONS

**15**  
CONCRETE  
ACTIONS

**43**  
INITIATIVES

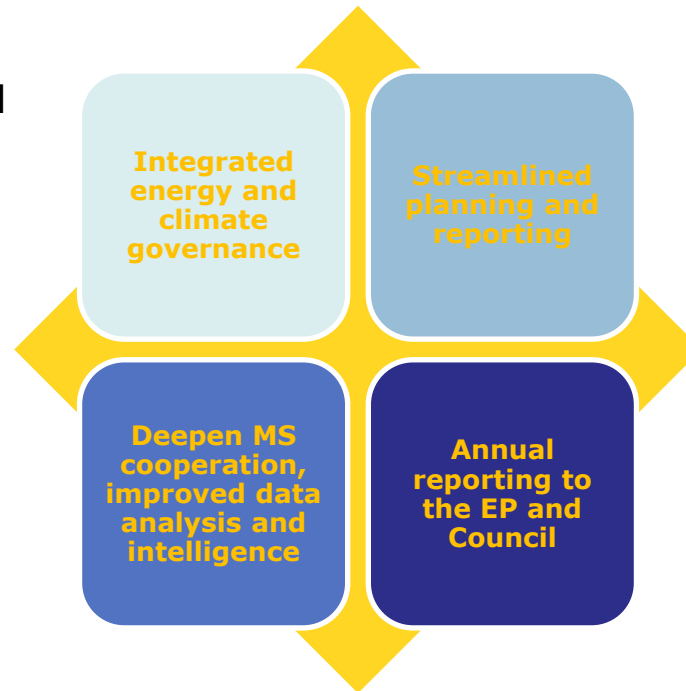
# Energy Union

- **Energy security, solidarity and trust**
- **A fully integrated internal energy market**
- **Energy efficiency first**
- **Transition to a low-carbon society**
- **An Energy Union for Research, Innovation and Competiveness**



# Delivering the Energy Union: A dynamic governance

**The Commission will launch a dynamic governance process for the European Energy Union**



Successful implementation depends on the political commitment of all actors concerned, including EU institutions and Member States!

## Way forward

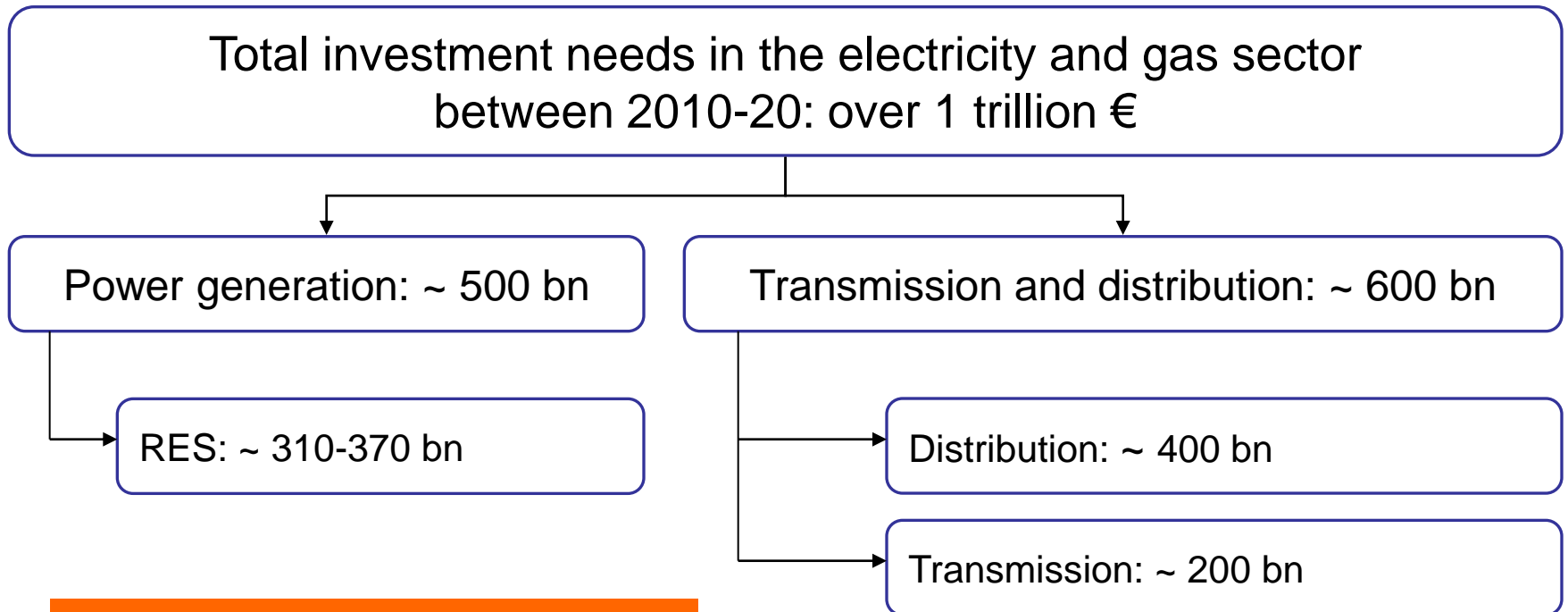
European Council adopted **conclusions on the Energy Union** at the summit on 19 to 20 March

VP high-level **bilateral meetings** with Member States on the Energy Union

**Guidance on Governance** from the Commission

**First report** on the state of the Energy Union already in 2015

## Energy system investment needs



NB: approximative figures, mainly  
from DG ENER calculations based  
on data from PRIMES, ENTSO-E,  
KEMA, ECOFYS etc.

## EU Funding for Sustainable Energy – MFF 2014-2020

- **Cohesion Policy** to allocate some 39 billion € (estimate!) to investments in energy efficiency, renewable energy, smart grids and urban mobility, including research and innovation in those areas in complementarity with Horizon 2020
- **Horizon 2020:** some 5.4 billion € to be allocated to research and innovation in "Secure, clean and efficient energy"
- **Connecting Europe Facility:** some 5 billion € to be allocated to investments in TEN-E infrastructure of highest European added value
- **Other European Structural and Investment (ESI) Funds:**
  - European Agricultural Fund for Rural Development (EAFRD)
  - European Maritime and Fisheries Fund (EMFF)
  - European Social Fund (ESF)
- **LIFE+** and **COSME** might also be relevant for certain aspects
- **EEEF**
- **Aid to developing countries (Energy – 350 mill in 2014)**



# The Research Programme Horizon 2020

Topics related to gas received 40m€ in 2014/2015, covering:

- Flexible and efficient fossil fuel power plants
- Environmental impacts of shale gas
- Decarbonisation of the fossil fuel-based power sector and energy intensive industry through CCS
- Supporting Joint Actions on demonstration and validation of innovative energy solutions
- Supporting coordination of national R&D activities

In 2016 and 2017 calls planned for 27m€ and around 40m€.

# "The Juncker Plan"

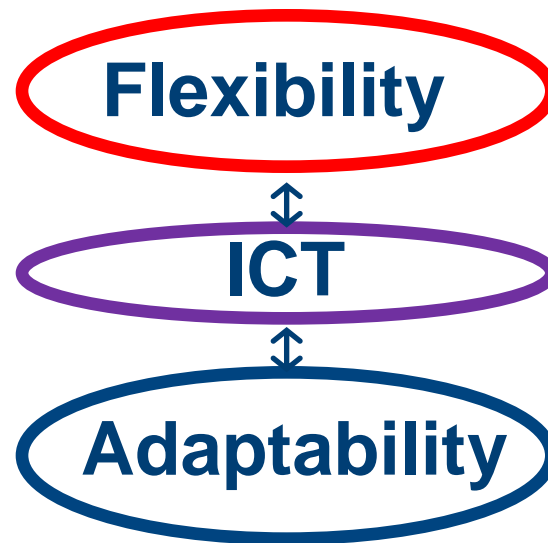
## **European Fund for Strategic Investments (EFSI)**

- Mobilise at least €315 billion in additional investment
- Will finance projects with a higher risk profile
- Established within the European Investment Bank (EIB), with the Commission as strategic partner.

# A flexible and adaptive energy system

## Smart Energy System

- Generation
- Demand
- Electricity, gas and heat networks
- Storage



**Power generation**

**Grid**

**Storage**

**Demand management**

**Transport; BEV, etc.**

**Prosumers**

**Markets**

**Fuel switching**

**Avoid lock-in**

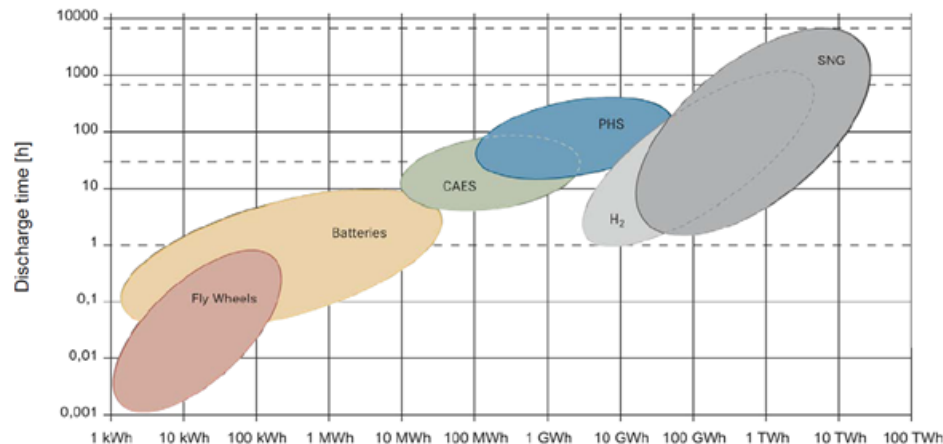
**Adaptation of the gas grid**

## Flexible generation and energy storage

- A energy system with large share of variable power sources requires capacity to cover peak demand and technology to use surplus supply efficiently
- Large scale electricity storage facilities faces challenges in the new energy system – closer integration of energy grids could support further progress
- Heat storage is also relevant - heat represents about half of the final energy demand
- Appropriate regulation and markets necessary for a cost-effective transition to low-carbon energy system.

# Large scale energy storage and RES integration

- Diversification of supply and routes is a key component of the EU energy policy
- Strategic energy reserves for crisis situations
- Large scale energy storage could complement strategic energy reserves (oil & gas)
  - Synergies between RES and the natural gas grids
  - Indigenous energy sources more important in future



CAES: Compressed Air Energy Storage  
 PHS: Pumped Hydro Storage  
 H<sub>2</sub>, SNG: Hydrogen, Synthetic Natural Gas)

Source: Research Center Jülich

## Inclusive gas approach

### Regulatory and policy topics to address

- **Supply security**
  - » Revision of the Regulation on security of gas supply (foreseen 2016)
  - » EU energy security strategy (2014)
- **LNG and storage**
  - » "Explore the full potential of liquefied natural gas (LNG), including as a back-up in crisis situations when insufficient gas is coming into Europe through the existing pipeline system"(foreseen 2016)
- **Technology and markets**
  - » Gas quality standards (including the blending and bio-methane)
  - » Certification system (=market) for low-carbon gas (industry, NG grid, mobility, etc.)
  - » Compatibility of gas based solutions with the (electricity) market models
  - » Potential impact of storage on the generation capacity and integrated development of that market (including the various P2G/P2H2 applications)

**Thank You for Your Attention!**

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**[http://ec.europa.eu/energy/index\\_en.htm](http://ec.europa.eu/energy/index_en.htm)**

