



## A SUSTAINABLE LOW CARBON ECONOMY ? EU Energy Policy in making... 2020... 2050...

Keywords: Policies and Targets, Strategies and Roadmaps,  
SET Plan, Implementation Mechanisms and Financing,...

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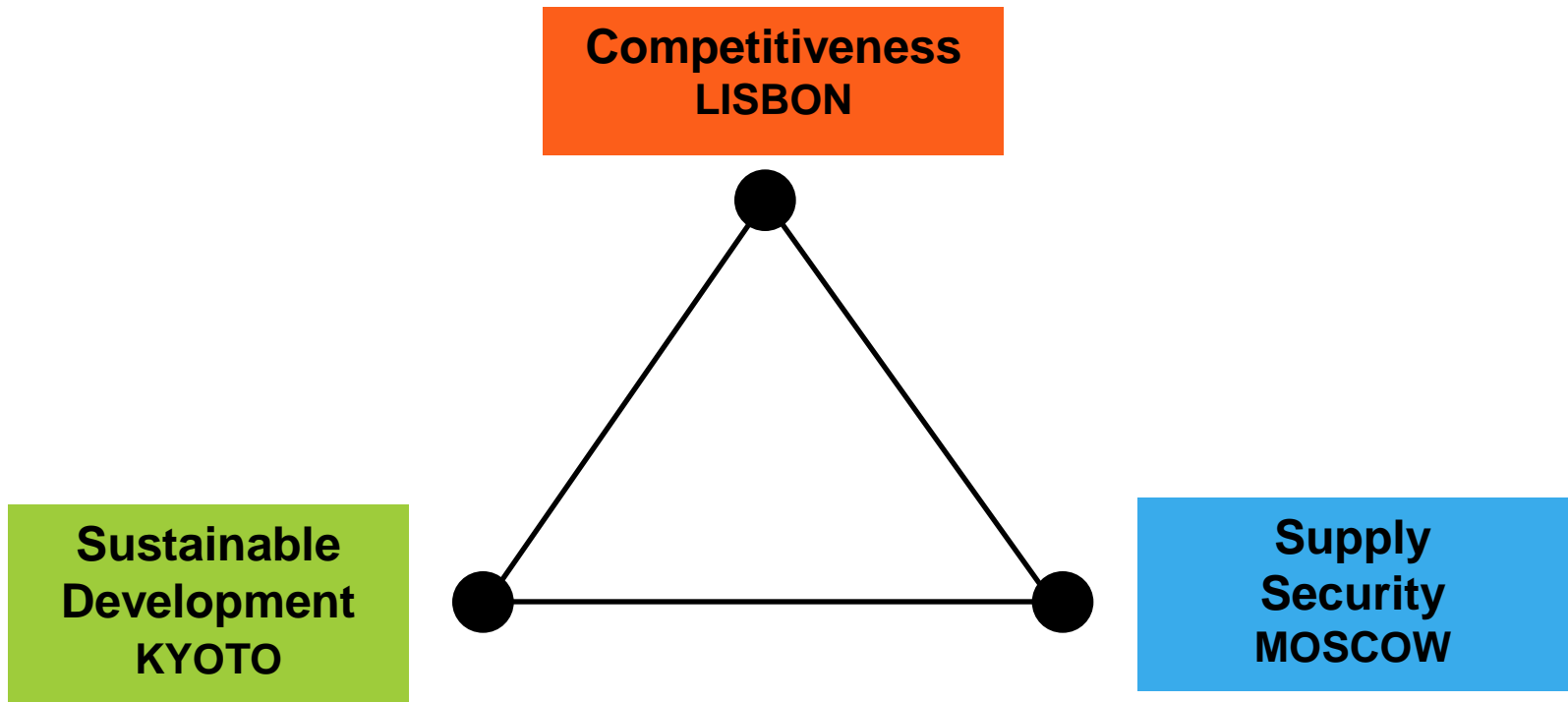
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EUROPEAN  
COMMISSION

# ● The drivers for Energy Policy at EU level:

YES... but... what is « sustainability » ???



# EU Energy Policy Initiatives: 2007-2009

- **Climate Change: Kyoto 1998-2005-2012... Cancun 2010... Durban 2011... 2012**
- **« An Energy Policy for Europe » - Jan 2007 – Adoption Council in March 2007**
  - Target 2020: 3x20: 20 % RES, 20% Energy Savings and 20% GHG reduction vs 1990 + Vision 2050: 60 to 80% GHG reduction\_– later updated to 80 to 95% !!!
- **« A European Strategic Energy Technology Plan » - SET Plan of November 2007 – Endorsed Council March 2008 + « Financing Needs » of November 2008 – Endorsed Council March 2009**
  - Need R&D and Innovation for low carbon energy. BAU not an option
  - Need work together – launch EERA (European Energy Research Alliance)
  - Propose 6 initial European Industrial Initiatives: Wind, Solar, Grid, CCS, Biofuels, Nuclear Fission, (+smart cities, HFC JTI, Fusion ITER,... +...)
  - Financing needs over 10 years 80 Billion Euros= 3xBAU
- **Second Strategic Energy Review of November 2008**
  - 2/3 carbon free electricity for 2020 (current 45 %) and 100% for 2050

# ● 2010: Europe 2020 Strategy



Areas for action to 2020 that will steer the process and be translated into national targets:

Employment

Research and Innovation

Climate change and Energy

Education

Combating poverty

...



# EU Energy Policy Initiatives in making... 2011

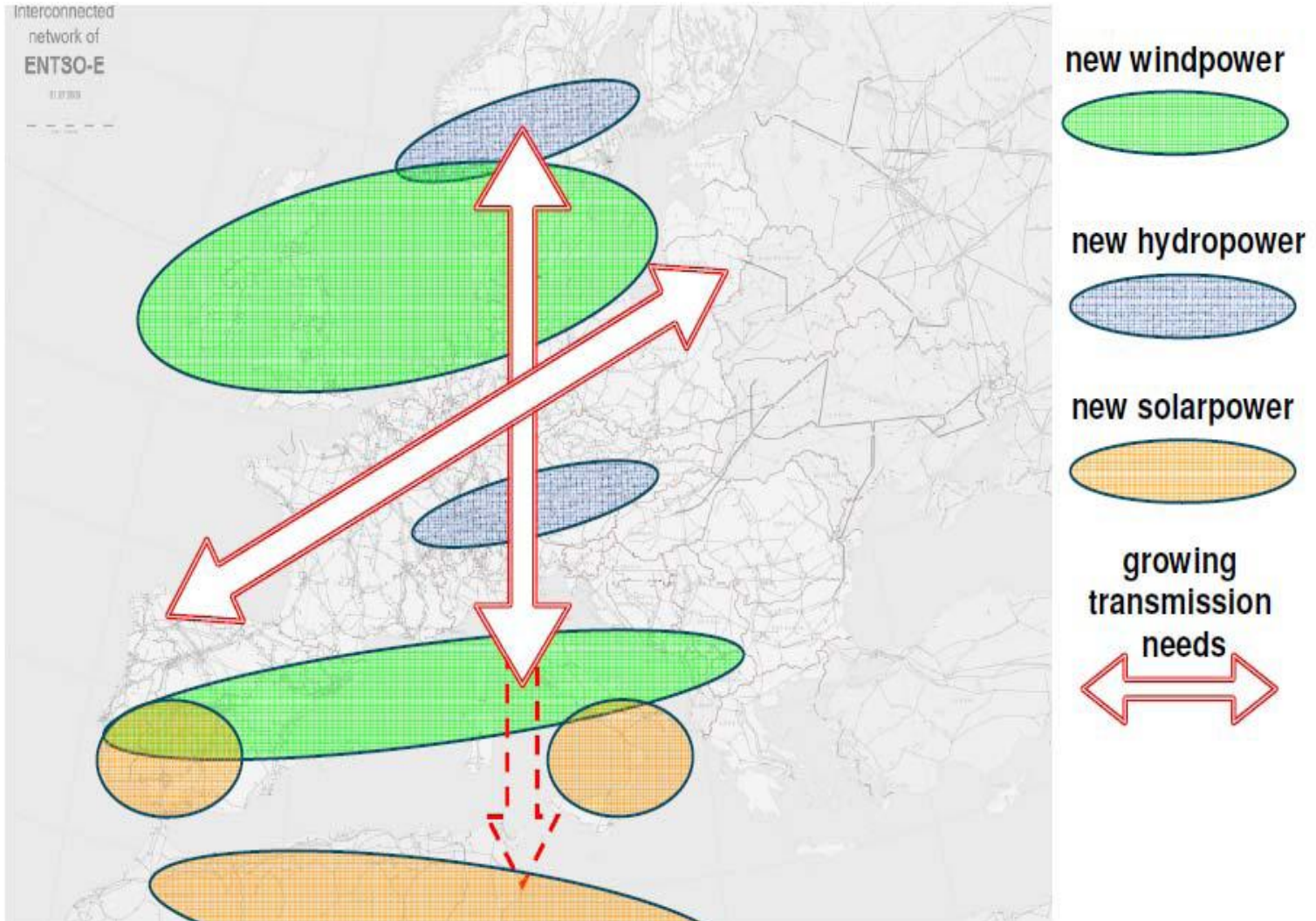
- Council Summit 4 Feb: Energy and Innovation
- Energy Strategy 2020 (Council Energy March):
  - Energy Efficiency
  - Market operation and infrastructures
  - Innovation
  - Safety and Security
  - International Cooperation
- Climate Roadmap 2050 (80 – 95% GHG reduction) and Transport Roadmap - June  
Cost climate change adaptation 125 billion Euros per year up to 2020 (3x20)
- Energy Roadmap 2050 – for end of year (scenarios and policy)
- Financial Perspectives – MFF 2014-2020 – June/December
  - Infrastructures
  - Research and Innovation: Horizon 2020 « FP8+ » (Needs 80 Billion Euros up to 2020)
  - Cohesion/Structural Funds (ia infrastructures, EE and R&I)
  - New tools – pooling together and fostering PPPs

PS: Needs for priority Infrastructures gas and power interconnections 200 billion Euros up to 2020 (100 private + 100 public) – included in global figure 1 billion Euros with replacement of ageing generation fleet...



# European Super Smart Grid Vision 2020/2050

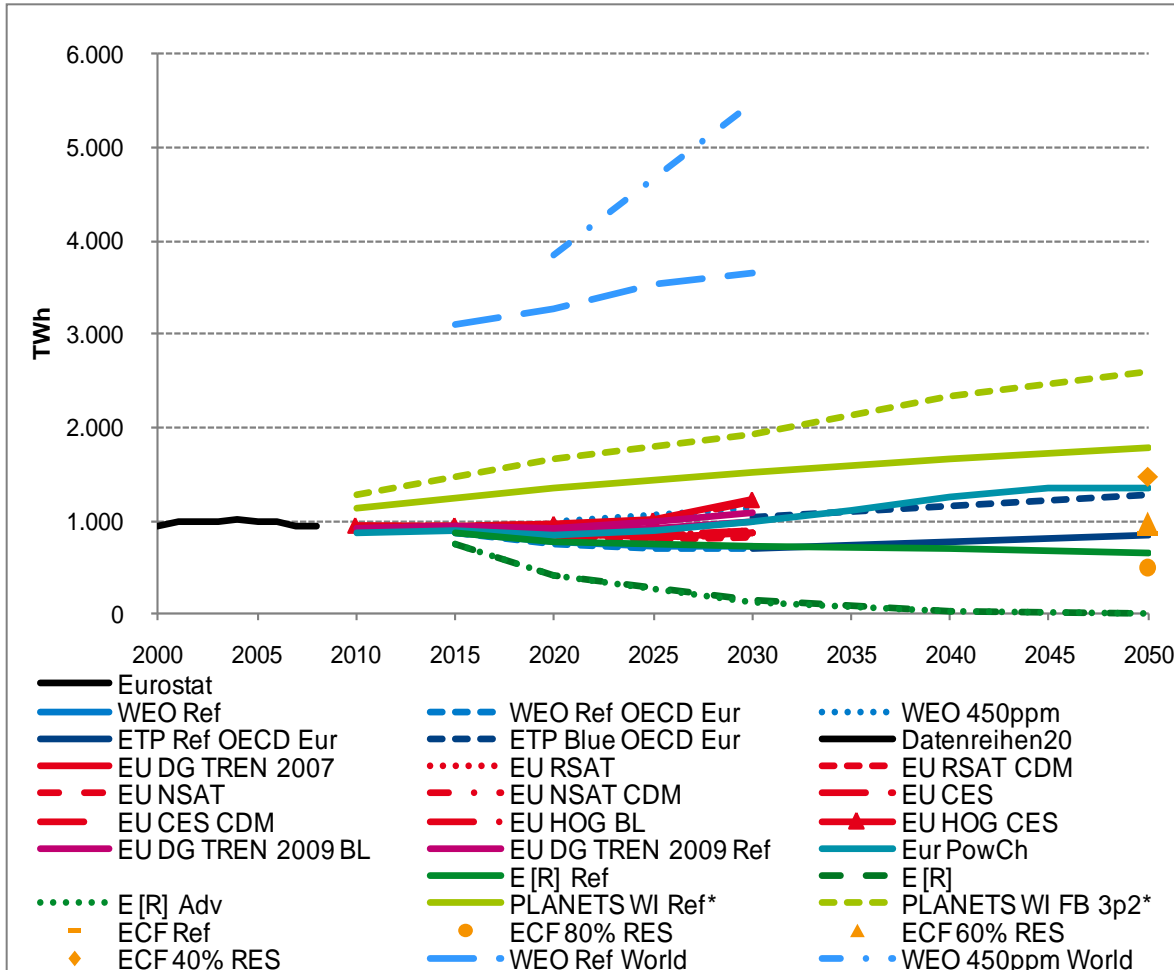
for market operation and RES integration





# PROGNOS Study (ENEF)

## Development of nuclear power generation, in TWh



World (IEA data)

Europe

## ● EURELECTRIC Study 2050 « PowerChoices » Scenario

Target: EU 75% GHG reduction in 2050 vs 1990 to respect IPPC 4th  
Assessment: 440 ppm CO<sub>2</sub> eq and 2 deg C  
50% GHG reduction worldwide and 60 to 80% OECD

Means carbon-free electricity in 2050 in EU = 2<sup>nd</sup> SER

Lot of energy efficiency and savings – primary energy needs decrease  
from 1800 Mtoe (2005) to 1400 Mtoe (2050)

Electricity demand increases from 3100 to 4800 TWh

Mainly RES – from 15% to 40 % – mainly wind  
2x15 % by Coal and Gas  
Nuclear from 950 TWh to 1300 TWh (31 to 28%)

**TARGET: 30% EU electricity generation by nuclear: flexible and reasonable**

!!! Overall cost of PowerChoices: Investment needed:  
2 trillion Euros for 2050 (of 2005)... EC estimation Power  
Infrastructures 2020 1 trillion Euros



# ● Implementation Mechanisms

## Extract (not exhaustive) of the DG ENER Workplan 2011

### European Commission documents

- Energy Efficiency Plan – adopted March
- Communication on Smart Grids – adopted March
- Report on how to address obstacles to infrastructure investment – final June
- Benchmarking Annual Report on Internal Market and consumer issues – adopted June
- Legislative Proposal on Energy Efficiency – adopted June 2011
- Communication on security of energy supply and international cooperation – adopted September
- Decision on information exchange mechanism between MS and 3d countries in the energy field – adopted September
- Regulation on Energy Infrastructures – expected October
- Followup Communication offshore oil and gas safety – expected October
- Directive indirect land use change related to biofuels – expected October
- Communication Nuclear Safety Stress Tests – expected November
- Communication on Energy Research and Smart Cities – expected November
- Energy Roadmap 2050 – expected December
- EU sustainability criteria for solid and gas biomass – expected December
- Communication PINC – postponed 2012

From EC to Council and Parliament (according to procedures TEU/TFEU or Euratom) for Directives/Regulations to become EU law to be transposed in national laws and further monitoring by the European Commission

# Some insights in the EU MFF 2014-2020

- **June 2011 – Communication MFF adopted by the Commission**
  - 2014-2020: 1.025 Billion Euros (2011 value) – compared with 975 Billion previous period
  - Represents 1,05% of the GNI at EU level – diverse reactions EP and MS
  - Big blocks remain CAP+Fisheries and Cohesion Policies = 37% each from 41 and 36 previous
  - Environment and Climate are to be derived into the other policies – ia Cohesion Funds priorities for EE and RES (20% for most advanced regions)
  - RD&I (Horizon 2020) get 46% increase from 55 to 80 Billion Euros (plus via Cohesion Funds) - Energy ??? 1,5 Billion per year excluding nuclear ??? Nuclear BAU + ITER ???
  - Infrastructures for Interconnection in Europe: Transport, ICT and Energy = 40 Billion Euros (plus 10 Billion from Cohesion Funds) – of which 9 for priority energy interconnections (list for electricity: North Sea 40 GW, South West, Central and South East, BEMIP)
  - Nuclear - Security and Decommissioning: 700 Million Euros
    - International Cooperation Safety: 600 Million Euros
    - ITER (out MFF?)
- **December 2011 – Details per sectors**
- **2012/2013 : Council and EP**
- **PS: other « tools » - EERP and NER 300 type**

## ● And... Nuclear Energy at EU level ???

1/ Legislative basis: Euratom Treaty (Research, BSS, Safeguards,...) separate from TEU...

+ Secondary legislation including in new areas:

- 2009 Nuclear Safety Directive
- 2011 Directive on RW and SF Management

2/ Fora for Dialogue – a new governance in making :  
ENSREG, ENEF, SNETP/IDGTP

3/ Research and Innovation: SET Plan – SNETP

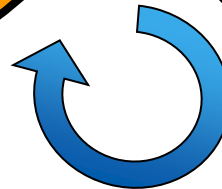
... and the Stress Tests...

## Safety Authorities

European nuclear  
safety regulators  
group - ENSREG

## Stakeholders

European Nuclear  
Energy Forum  
ENEF



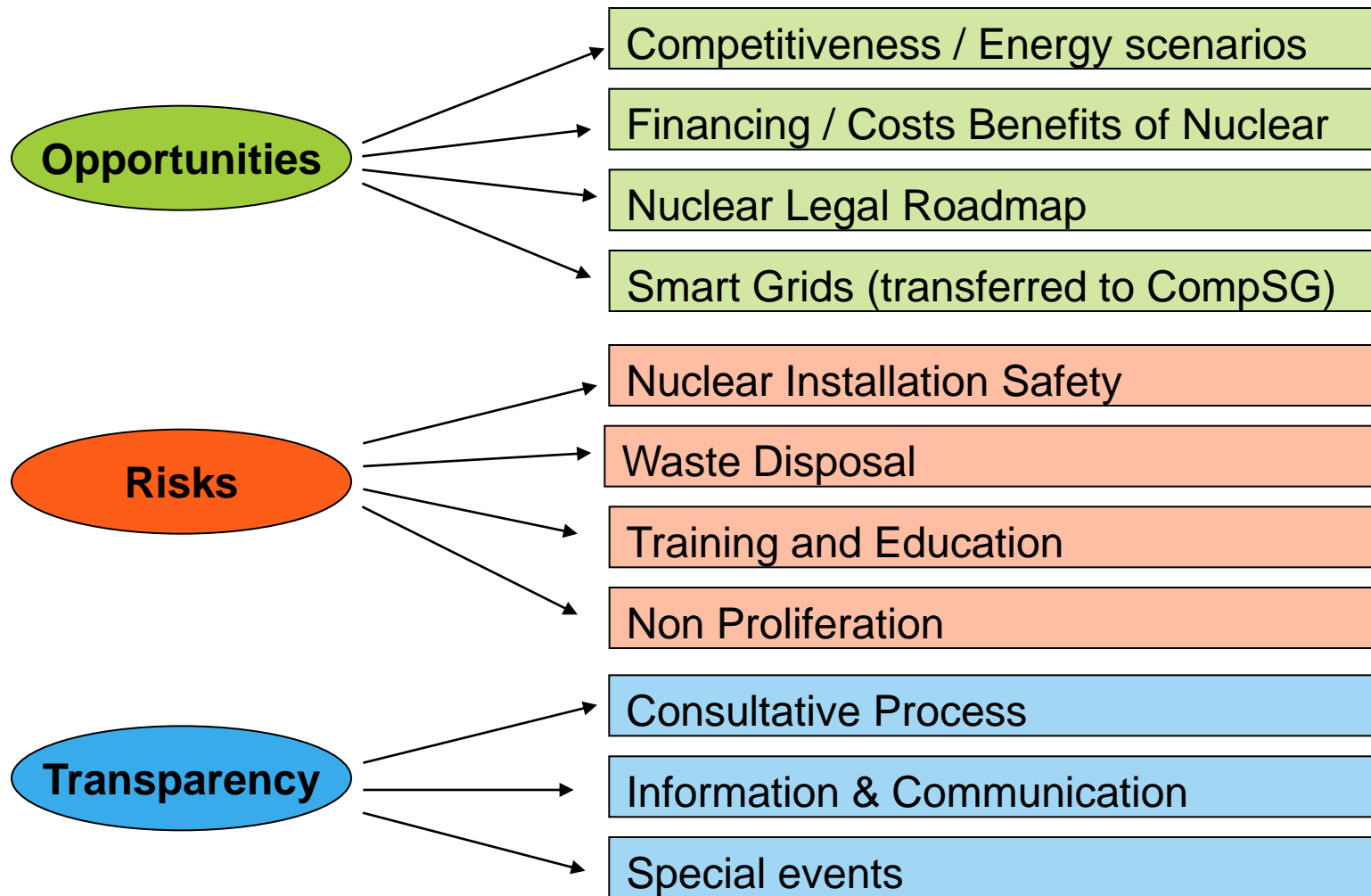
## Research/Innovation

Technology Platforms

SNETP and IGD-TP

- Towards a new nuclear governance

# European Nuclear Energy Forum - ENEF





## ● SET-Plan & nuclear fission



- SET Plan: EIs Wind-Solar-Grid-Bio-CCS-Nuclear
- Nuclear Key EU technology challenges for the next 10 years
  - ... to meet 2020 targets:
    - » ***“Maintain competitiveness in fission technologies, together with long-term waste management solutions”***
  - ... to meet 2050 vision:
    - » ***“Complete the preparations for the demonstration of a new generation (Gen-IV) of fission reactors for increased sustainability”***

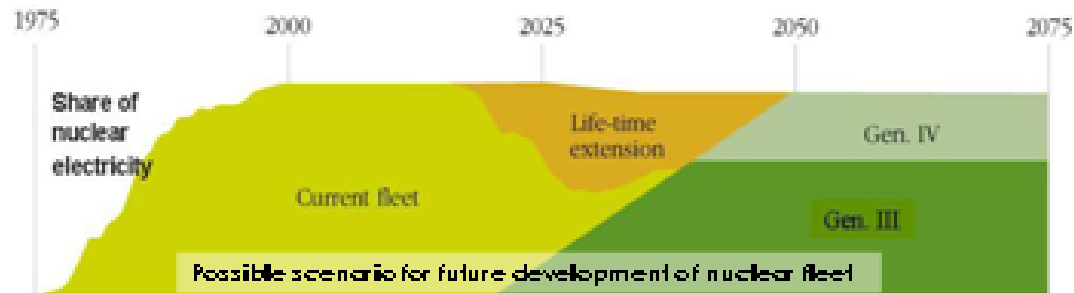
# A vision for nuclear power

## Towards sustainable nuclear energy



Major role of LWRs in the 21st century:

- Current PWRs (Gen II): life time management (> 40yr)
- Gen III PWRs : starting around 2015



Gen IV:

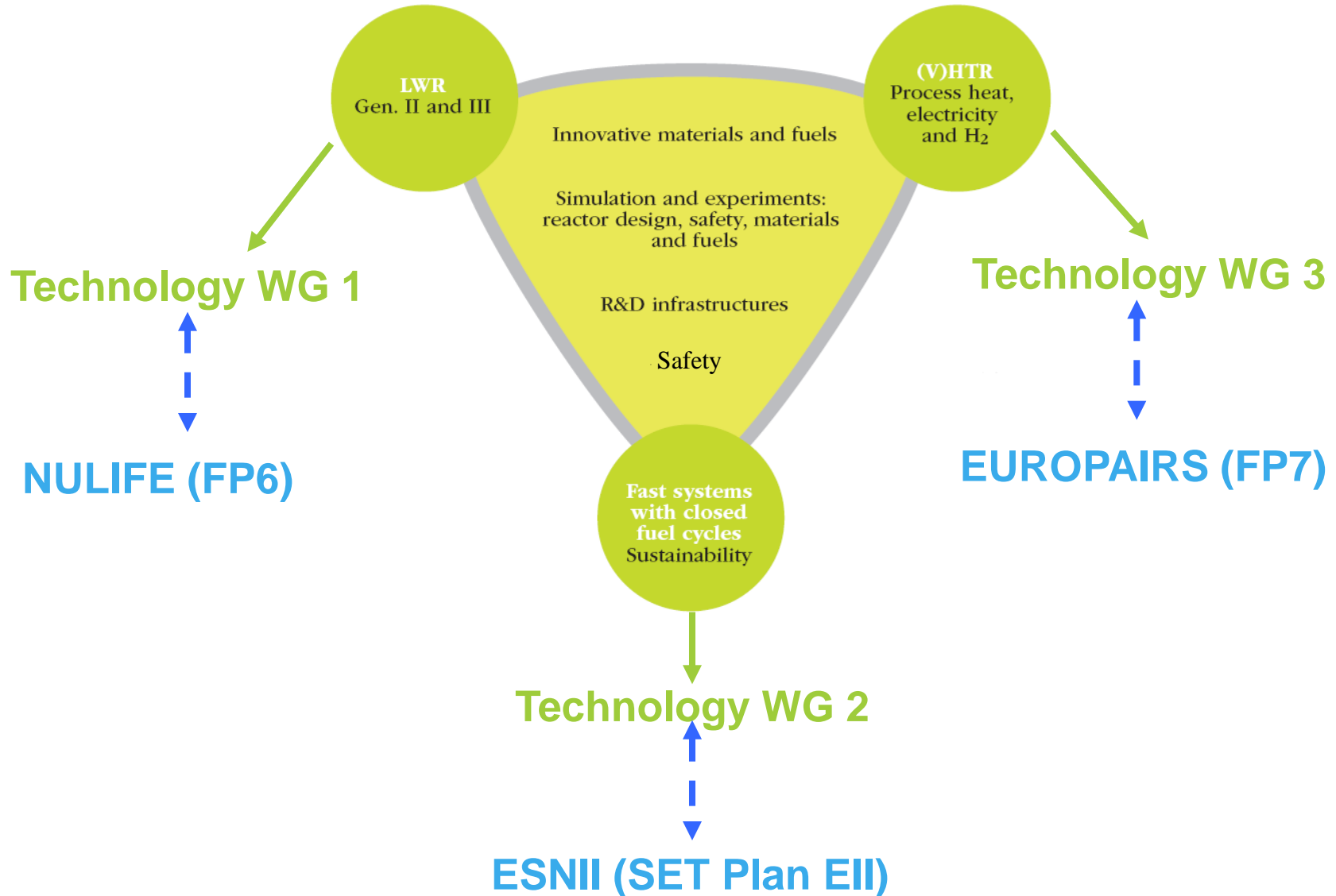
- Sustainability and U resource preservation: x 50-100
- Waste management improvement

**Deployment of fast neutron systems foreseen around 2040, depending on the maturity of the technology and on the market needs.**

**→ European Industrial Initiative**

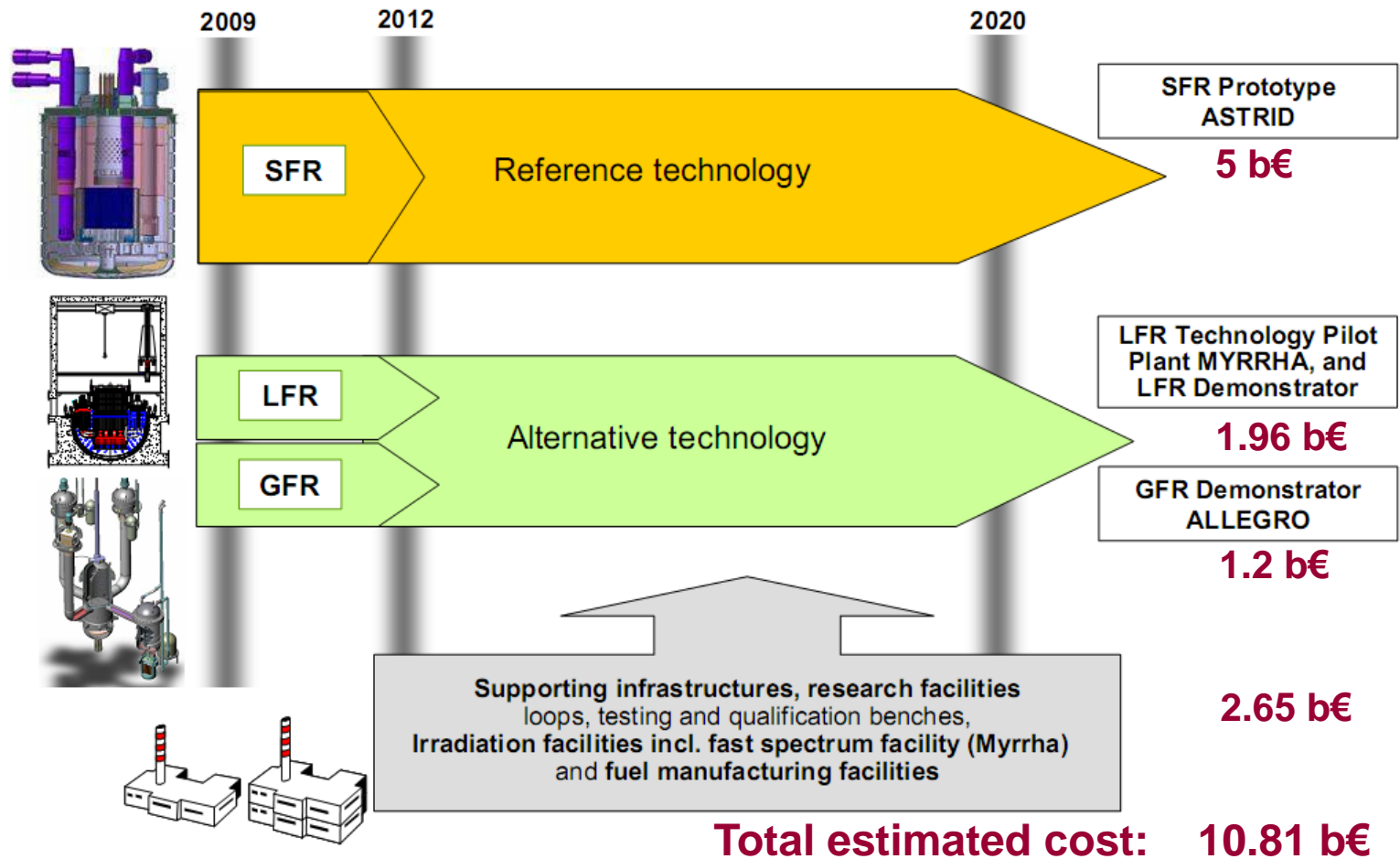


# SNE-TP



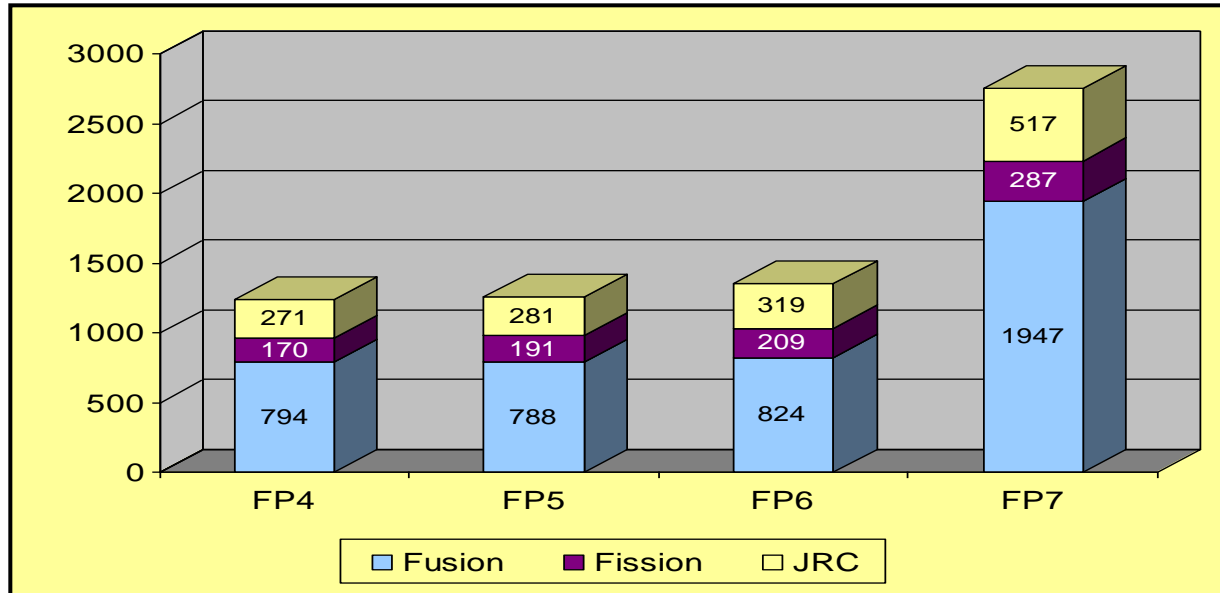
# The European Sustainable Nuclear Industrial Initiative

## ESNII



# Euratom FP

- FP4 to FP7 (up to 2011)



- FP7+2 (2012-2013): 2200 MEuros Fusion (ITER) and 118 MEuros Fission
- Horizon 2020 (2014-2020) ??? + Other tools ??? ITER/Fission...



# Safety and risk assessments - milestones

- 15 March: Commissioner Oettinger announces **stress tests of nuclear facilities** in the EU
- 21 March: Energy Council (energy ministers from MS) endorses the Commission proposal to **carry out comprehensive safety and risk assessments**
- 24-25 March: European Council (Heads of State and Government) calls on the Commission and the European Nuclear Safety Regulators' Group (ENSREG) to **develop the scope and modalities of the assessments**
- 24 May: the Commission and ENSREG **reach agreement on the methodology and the timetable**



# Assessments - timetable - Safety

- 1 June: national regulators initiate the tests process
- 15 August: operators carry out reassessments and submit progress reports to national regulators
- 15 September: regulators consolidate the data into national progress reports
- 31 October: operators' final reports
- By 9 December: progress report from the Commission to the European Council, which assesses preliminary findings
- 31 December: national final reports
- 30 April 2012: completion of peer reviews
- June 2012: consolidated report from the Commission to the European Council