



1

FRAMEWORK FOR THE OPERATION AND DEVELOPMENT OF EU ENERGY GRIDS

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A Smart EU Energy Policy



2

**Electricity will play a more and more
important role in order to achieve the three
main goals of the EU Energy Policy :**

- **Reduction of the CO2 emissions**
- **Increase of security of supply**
- **More competitiveness of EU economy**



- In the demand side, it allows a high energy efficiency
- In the supply side it allows a strong development of low carbon energy sources (wind, hydro, geothermal, nuclear)



EU 27 GROSS ELECTRICITY GENERATION 2005 (TWh)

54,6%	COAL OIL GAS OTHERS	940	28,4 %
		139	4,2%
		694	21,0%
		40	1,2%
45,4%	NUCLEAR HYDRO RENEWABLES	998	30,2%
		341	10,4%
		157	4,8%
Total		3309	



5

EU 27 GROSS ELECTRICITY GENERATION IN 2020

- 2/3d OF THE GENERATION FROM LOW CARBON SOURCES
- 1/3d FROM NUCLEAR
- 1/3d FROM RENEWABLES
WIND ENERGY COULD SHARE 13% (1,9% in 2005)



6

**13% of electricity mix in 2020
will represent more than 500 TWh out
of a total of 4 000 TWh**

- To generate such an output, between 200 and 250 GW of wind capacity should be connected to the European grid out of a total of 1 000 GW installed capacity.



7

IN 2050

- **WHEN CARBON CAPTURE AND SEQUESTRATION WILL BE AVAILABLE, IT IS POSSIBLE TO IMAGINE AN ALMOST CO₂ FREE EU POWER SYSTEM**



8

- **SUCH A DRASTIC CHANGE IN POWER SYSTEMS WILL NEED A STRONG EVOLUTION OF POWER GRIDS**



9

Why such a need ?

- To allow integration of large quantity of intermittent renewable energy (wind and later on solar)
- To increase the security of supply for mutual back-up of neighbouring member state power grids and regional neighbouring systems
- To achieve a better integration of the EU electricity market



10

What does it mean for the EU high voltage grid ?

- A strong increase of the interconnections within the EU grid
- An extension of the interconnections beyond the present EU grid limit (around the Mediterranean sea, with the Russian IPS UPS system)
- A better efficiency of the operation of the EU grid



11

Some available technologies to meet these challenges

- Hybrid high voltage grids (AC+DC)
- Underground and submarine EHV synthetic cables (AC+DC)
- AC gas insulated link
- More intelligence in the grid (from a European control centre to the end users)



12

4 priority development plans for the EU electricity grid *

- A Baltic interconnection plan
- A Mediterranean power ring plan
- A North South power interconnection plan within Central and South East Europe
- A North sea offshore grid plan

*Second strategic energy review of the European Commission (October 2008)