Integrating large shares of fluctuating power sources into power electric systems

Introduction by

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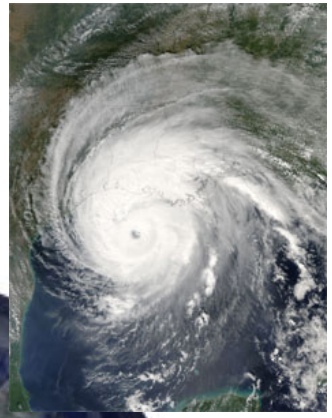
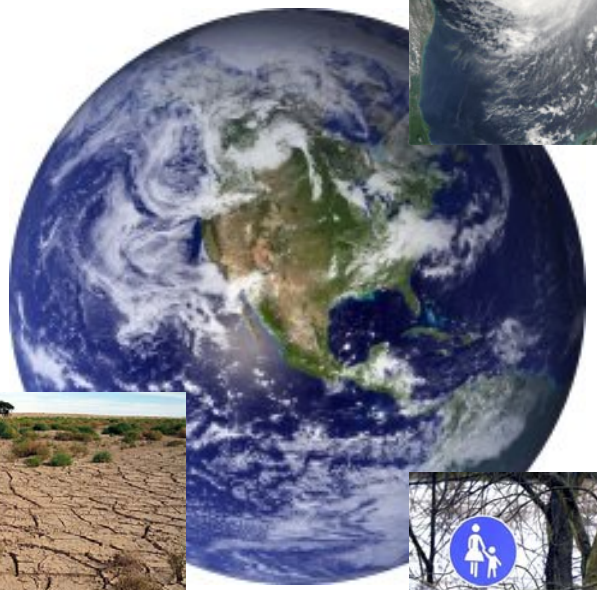
THE CLIMATIC CHANGE

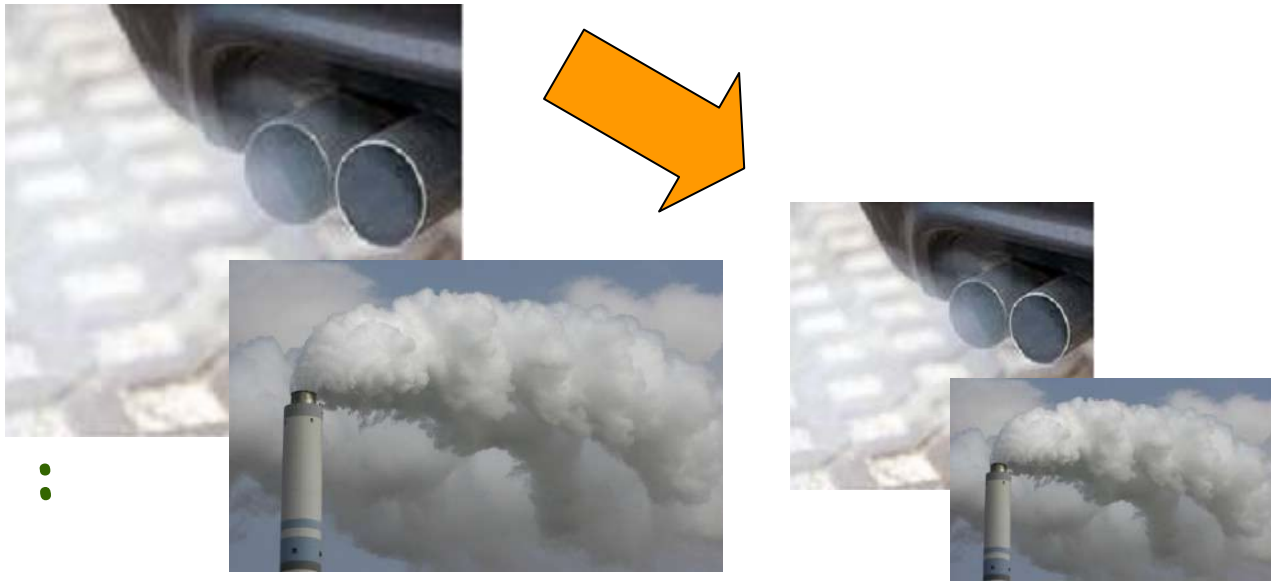
is the main threat

for our planet

for the next decades





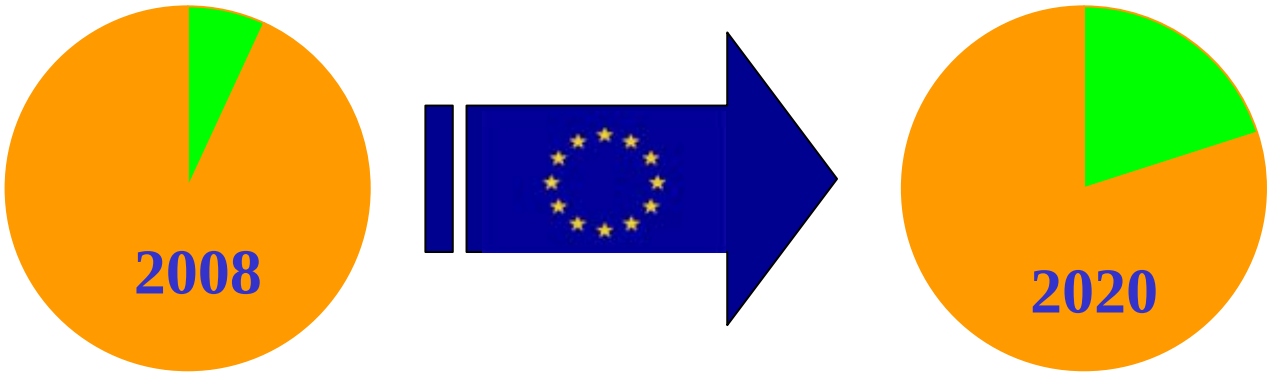


OBJECTIVES of Governments :

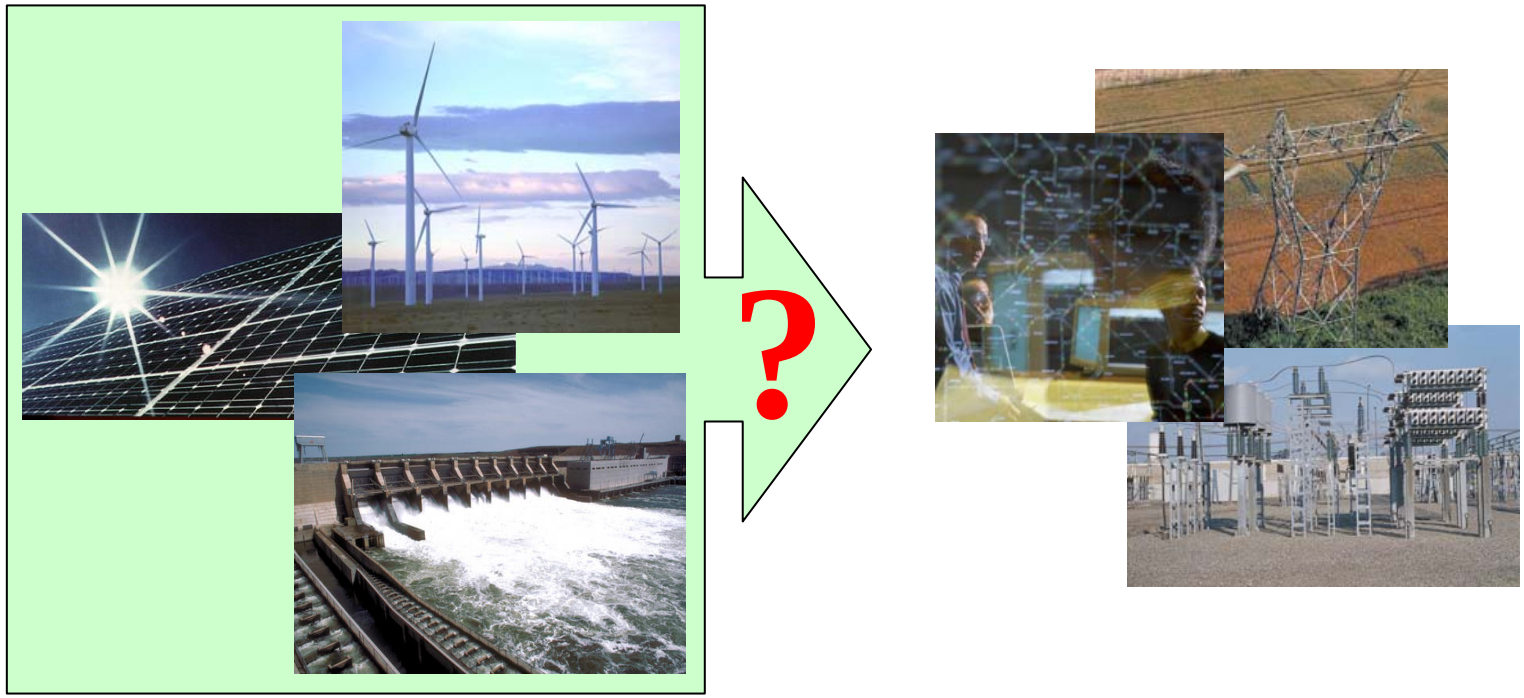
- Reduction of 50 % of world wide CO_2 emissions by 2050

- Reduction of 20 % of European CO_2 emissions by 2020 (ref.= 1990 level)

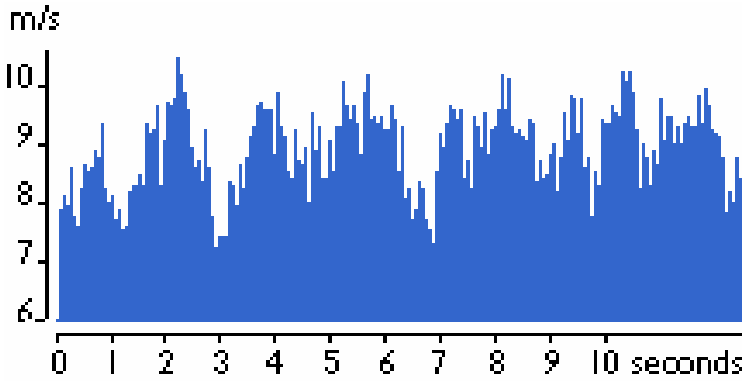
The European target is to increase the share of renewables in the European energy mix from 7% today to 20 % in 2020



For power systems, what could be the impact of the integration of large shares of renewable electric energy?



Renewable electric energy is mainly wind energy which by essence is a fluctuating power source.

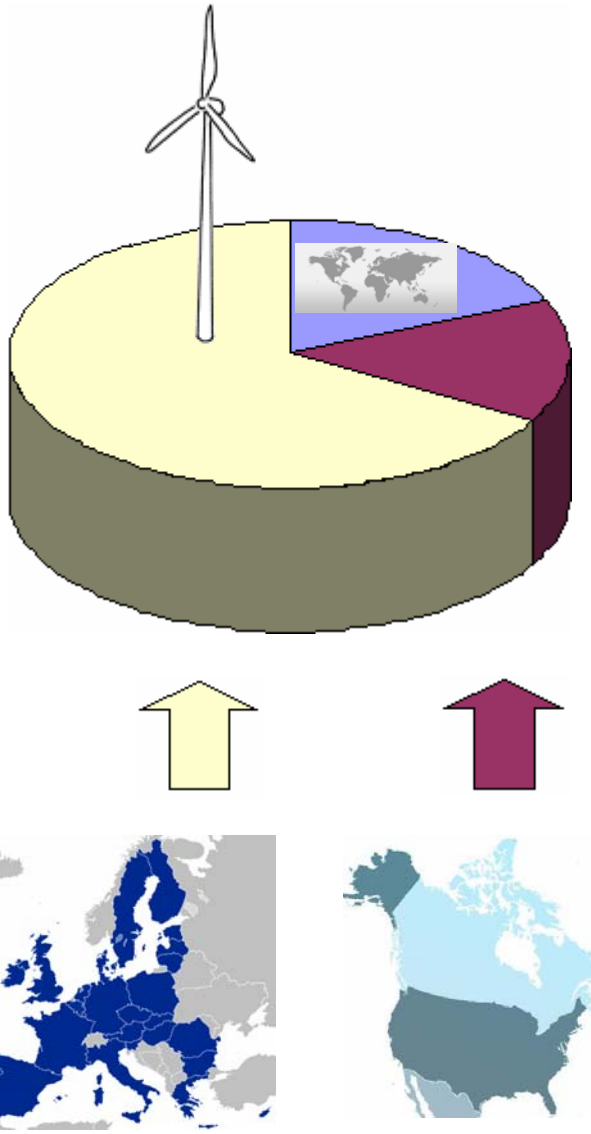


By the end of 2006 :

- 75 000 MW of wind power were connected to the grids

- 2/3 being installed in Europe

- 15 % in North America



What are the consequences for power systems if this capacity is multiplied :

- by 6 in Europe
- by 20 in the United States

. and even more in other parts of the world

… in order to achieve a large share (20%?) in the electric energy mix?

These consequences should be analysed from the point of view of :

① The development of transmission and distribution systems

② Their impact on the power system operation and control

③ The consequence on the price of electricity for the end users (taking into account the external effects of environment)

④ The need for new storage electric devices (advanced or conventional).

This is the purpose of this opening panel.