

Possible Key R&D Challenges in the European Electricity Industry: Managing evolution before revolutions

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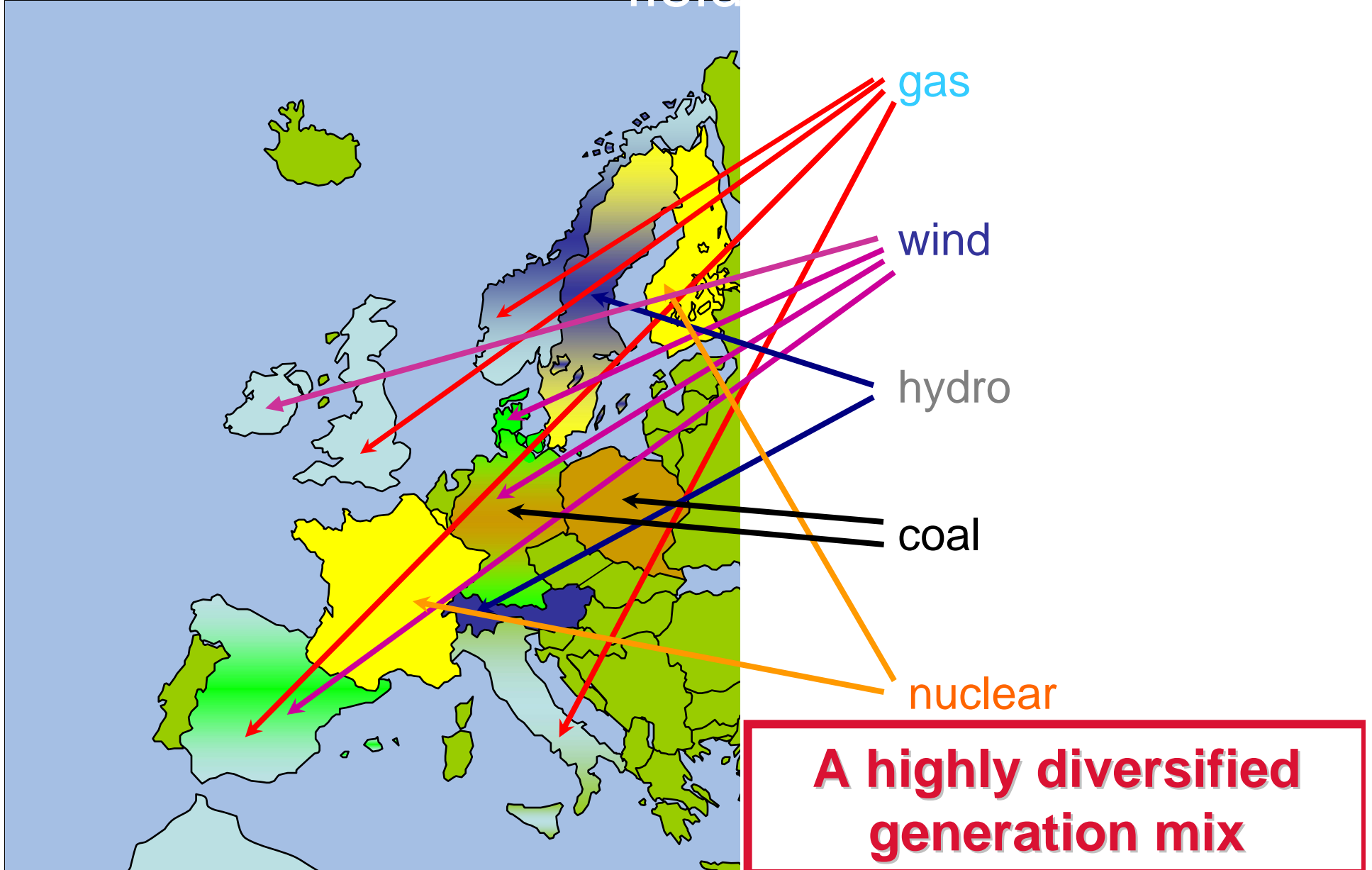


Today's picture

- Weak but geographically moving electricity consumption growth in many countries
- Steady mainstream technical processes, no technical revolution
- Trend towards staff reduction, downsizing and early expert retirement
- Growing difficulty to build any new infrastructure



1st new dynamics in Europe: a larger playing field



Global optimization thanks to the electricity market: Crucial for European Competitiveness

- ➔ The European market aims at prices as low as possible, thanks to:
 - An optimisation through **decentralised economic agents**
 - traders, generation owners, suppliers...
 - **Infrastructures** and trading tools set up by **neutral bodies** (e.g. unbundled **TSOs**)
 - providing liquid and sustainable wholesale markets
- ➔ A **€150 bn yearly market with huge possible savings**
 - ➔ **€1400 bn of investments to come by 2030 in the European electricity sector**

Current challenges

- ➔ Highly reliable decentralised optimisation tools will be more and more required
 - e.g. *European 'flow-based market coupling'*
- ➔ Tight coordination to address Security of Supply issues
 - New interdependance **throughout** huge synchronous zones
 - New interdependance **between** synchronous zones
 - Fast changes in flow patterns...
 - ... with inadequate infrastructures



Current challenges (2/2)

- The end of fixed control areas matching political borders
- Flexible price areas reflecting actual congestion bottlenecks
- Smart integration of true decentralized energy (solar)
- Quick huge shifts of generation (in some mn) over Europe with already installed wind power

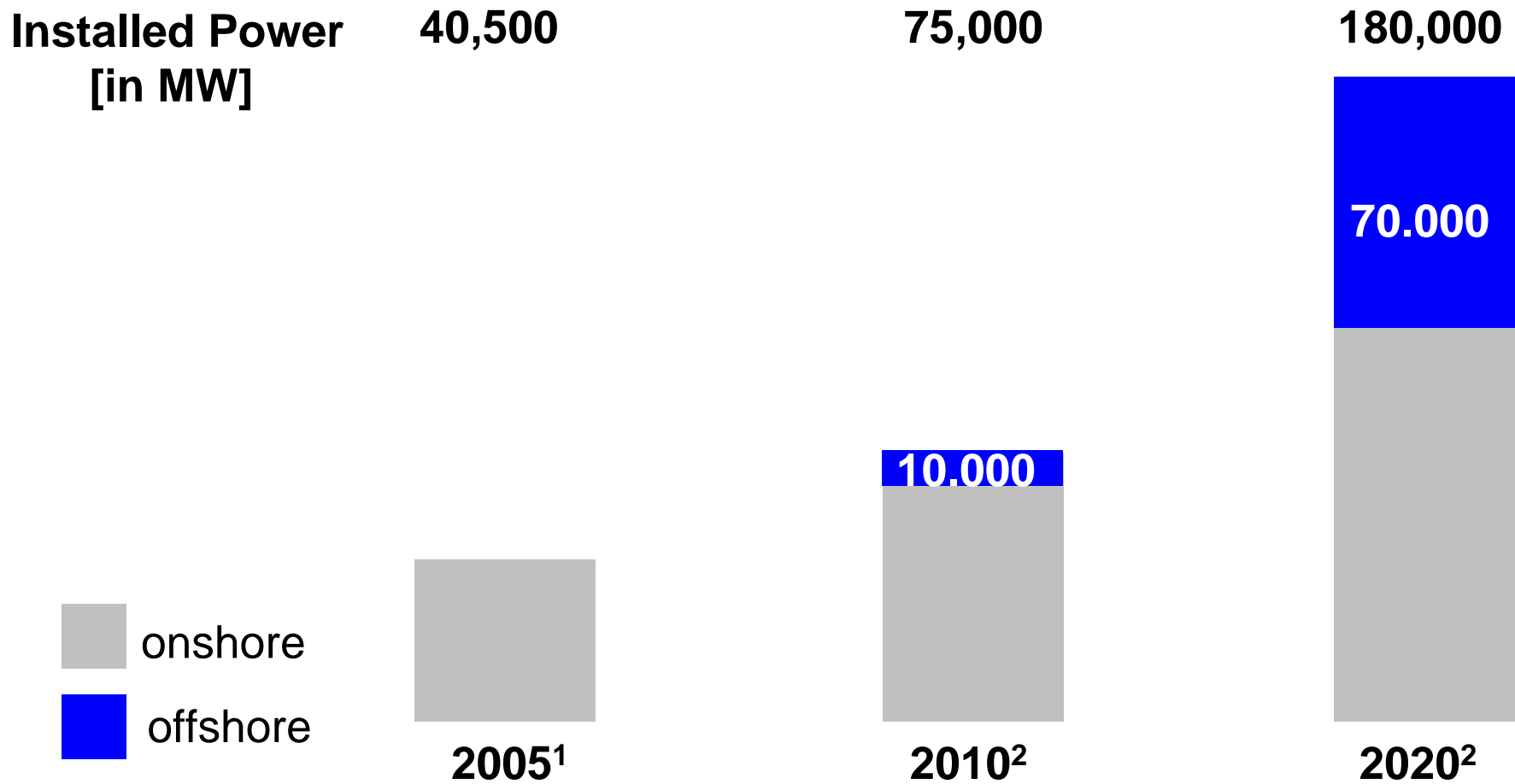




***2nd new dynamics in
Europe:
Towards a low-carbon European
economy?***

A new citizen concern with enormous political weight

Wind Power Development

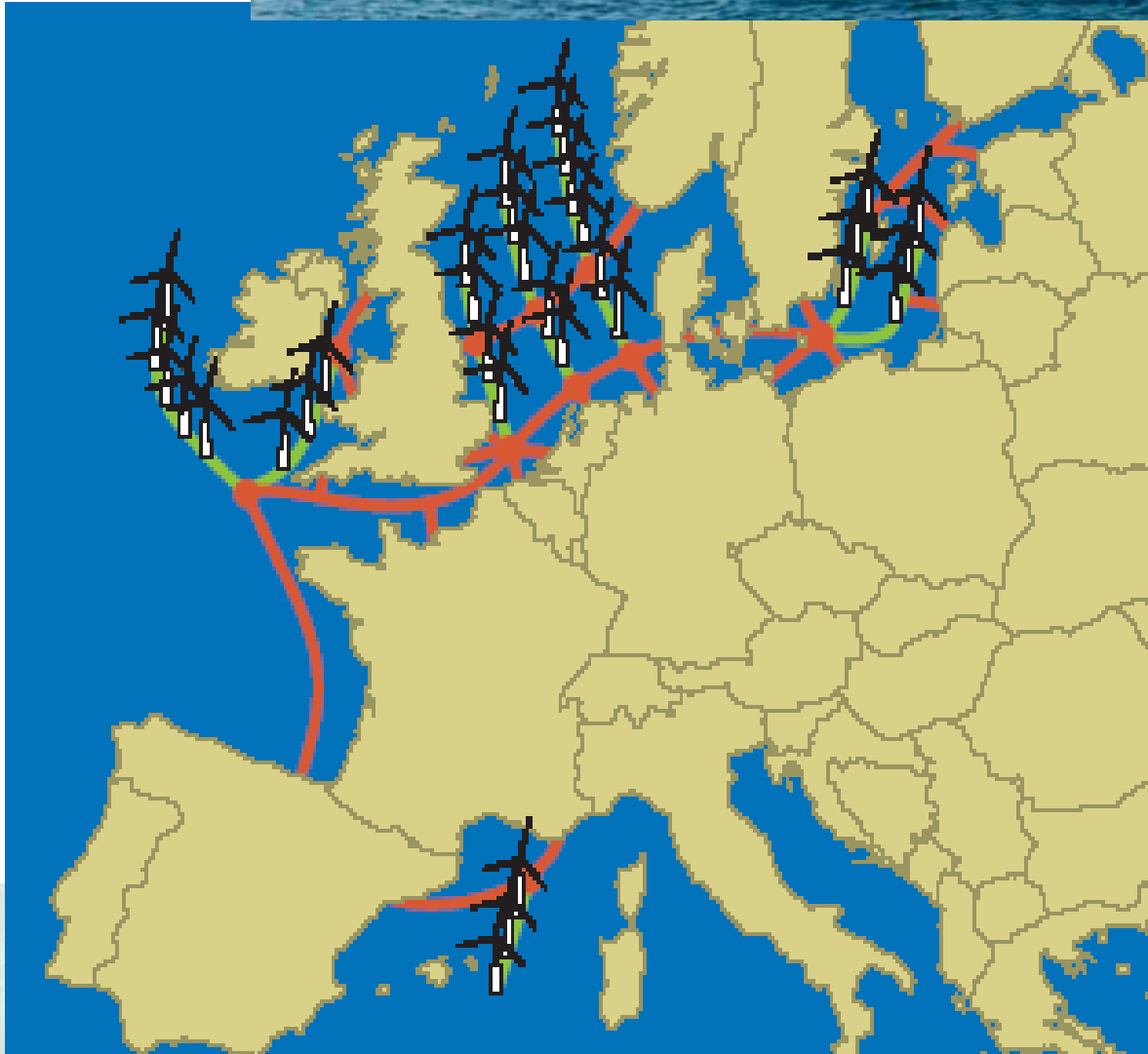


¹ 2005 /Source: EWEA

² EWEA targets

2030 ?





**An example:
'Supergrid'
d'Airtricity :**

**a €22bn
investment for the
'initial phase'...**



Addressing **tomorrow**'s challenges with **today**'s developing technologies ...

- Energy efficiency and savings
- Balancing and storage
- Keeping existing infrastructures alive for decades and upgrading them with 'unchanged look'
- Cable technology
- Power System monitoring and control

Being able to address complexity and multi-disciplinary problems



... while working hard on technological
revolutions for post 2030

- Local storage
- Nuclear fusion
- Hydrogen
- Biotechnologies
- ...



Thank you for your attention!

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