



Fondation "Partager le Savoir"
Sharing Knowledge Foundation

Rte
International

The European Grid and the Medring

1st March 2010, AMMAN



EUROPEAN ELECTRICITY TODAY

32 interconnected countries (25 EU Member States)

- security of the power system in real time
- economic optimisation
- security of supply

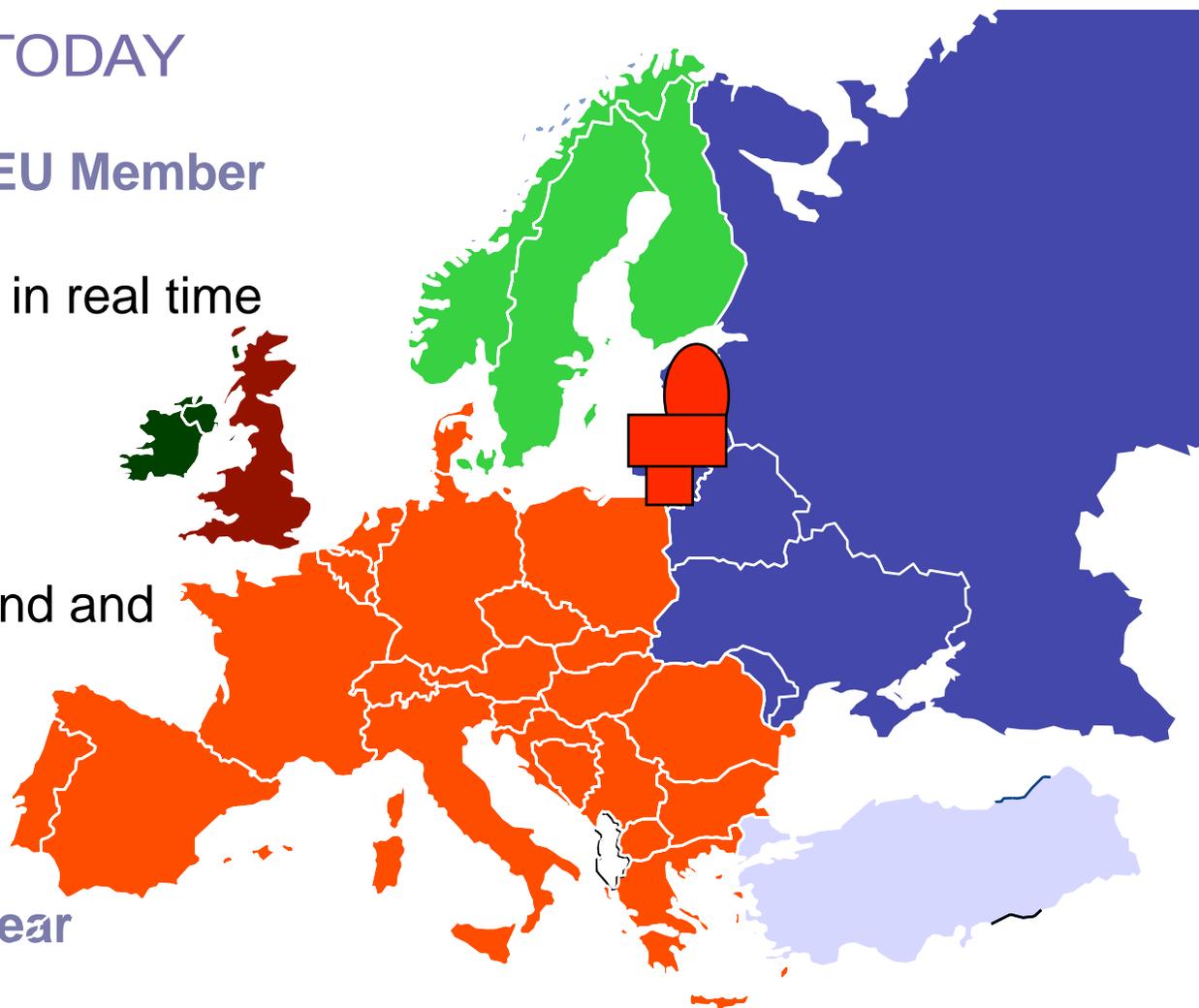
5 synchronous zones

Scandinavia, United Kingdom, Ireland and continental Europe, Baltic countries

Installed capacity: > 850 GW

Consumption > 3,400 TWh/year

Physical exchanges > 400 TWh/year





RTE's MISSIONS

- ✓ **Balancing electricity generation with consumption at all times**
- ✓ **Guaranteeing the secure operation of the power system on a permanently manner**
- ✓ **Maintaining and developing the network to allow generators, distribution networks and consumers to be connected, as well as interconnection with neighbouring countries**
- ✓ **Guaranteeing non-discriminatory access to the transmission network, whilst ensuring that commercially sensitive information remains confidential**
- ✓ **Integrating transmission installations into the environment and ensuring the security of people and property**

... all at the most economical cost possible

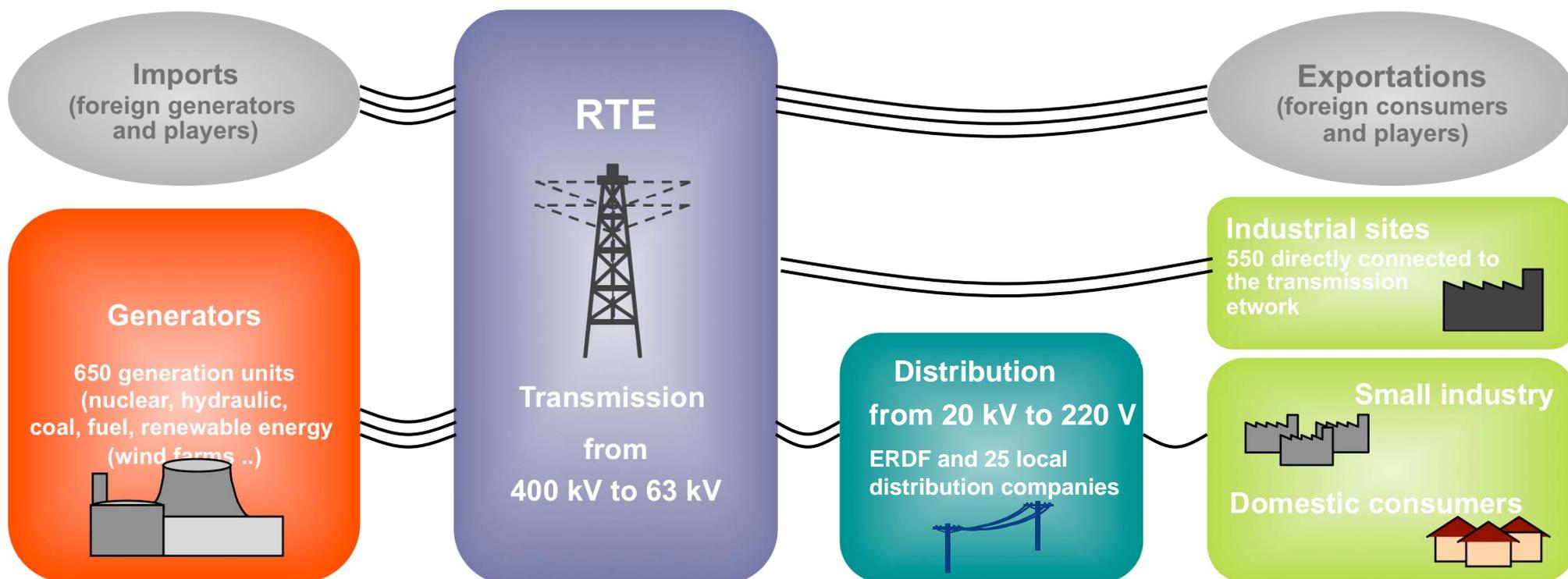


RTE's key figures

- **It owns and operates the largest electricity grid in Europe**
 - 100 000 km of EHV and HV lines (63 to 400 kV)
 - Peak load served > 92 GW (60+ million inhabitants)
 - 8500 staff
- **Financial figures in 2009**
 - Turnover: 4 130 million €
 - EBITDA: 1 211 million €
 - Investment : 1 021 million €
- **Consumption in France in 2009 : 486 TWh**
- **Net Exportation : 26 TWh**
- **Generation : 518 TWh**



THE DEREGULATED MARKET



Competing electricity suppliers and consumers, free to choose their supplier



NEW CHALLENGES

Generation from RES to confirm its take-off... while electricity demand is still on the rise

- Wind energy of course
 - From 4 GW installed (to day to)
 - 25 GW by 2020 (among which 6 GW offshore)
 - But also PV-solar (maybe an even greater potential)
 - 0.5 GW installed today to a 5.4 GW by 2020
- A modest growth in electricity demand (+1.4% a year) for the coming years : driven by small industry, tertiary and households



The RTE strategy for grid development

- **Almost no overhead transmission feasible outside existing corridors → new strategy for grid development needed**
- **2 pillars**
 - (i) Developing MARKETS**
→ improving the use of existing infrastructure
 - (ii) Developing GRIDS**
→ creating new infrastructure with innovative solutions
- ... supported by a strong commitment to innovation and R&D



(i) Developing markets

- Clever market designs can spare the need for additional physical infrastructure
- Market coupling between France, Belgium and the Netherlands implemented from November 2006 with impressive results concerning the price convergence and the use of interconnections
- Market coupling to be extended to Germany in 2010
- Market coupling to be extended to Nordic Countries, UK and Iberian Countries in 2011 (North West European backbone which represents more than 2/3 of the total consumption in Europe)



(ii) Developing infrastructures

- **Most new circuits from 50 to 225 kV underground (in France in 2008, 64 % of new subtransmission circuits have been built underground)**
- **Use of long AC 225 kV underground even far from urban areas (e.g. new project for securing supplies in the French Riviera)**
- **HVDC underground (and tunnels) as an alternative to 400 kV overhead (France-Spain, France-Italy ...), even for distances like 80 kilometers**
- **Upgrade use of existing corridors of overhead 400 kV with high temperature conductors (ACSS, ACCR...), Phase-Shifters, etc.**





ENTSO-E

- Being the body of transmission system operators at European level ENTSO-E's mission is to promote important aspects of energy policy in the face of significant challenges.

- Launched in December 2008, this new association is planned in the third European package to be involved in the elaboration of codes in the decision making process with Acer (regulators association) and the European "Comitology" (national governments) :
 - **Security** - coordinated, reliable and secure operations of the grids.
 - **Adequacy** - the development of the interconnected European grid (ten years plan)
 - **Market** - Market designs, transparency, tariff, ancillary services.
 - **Sustainability** - integration of new generation sources, particularly growing amounts of renewable energy and thus the achievement of the EU's greenhouse gases reduction goals.

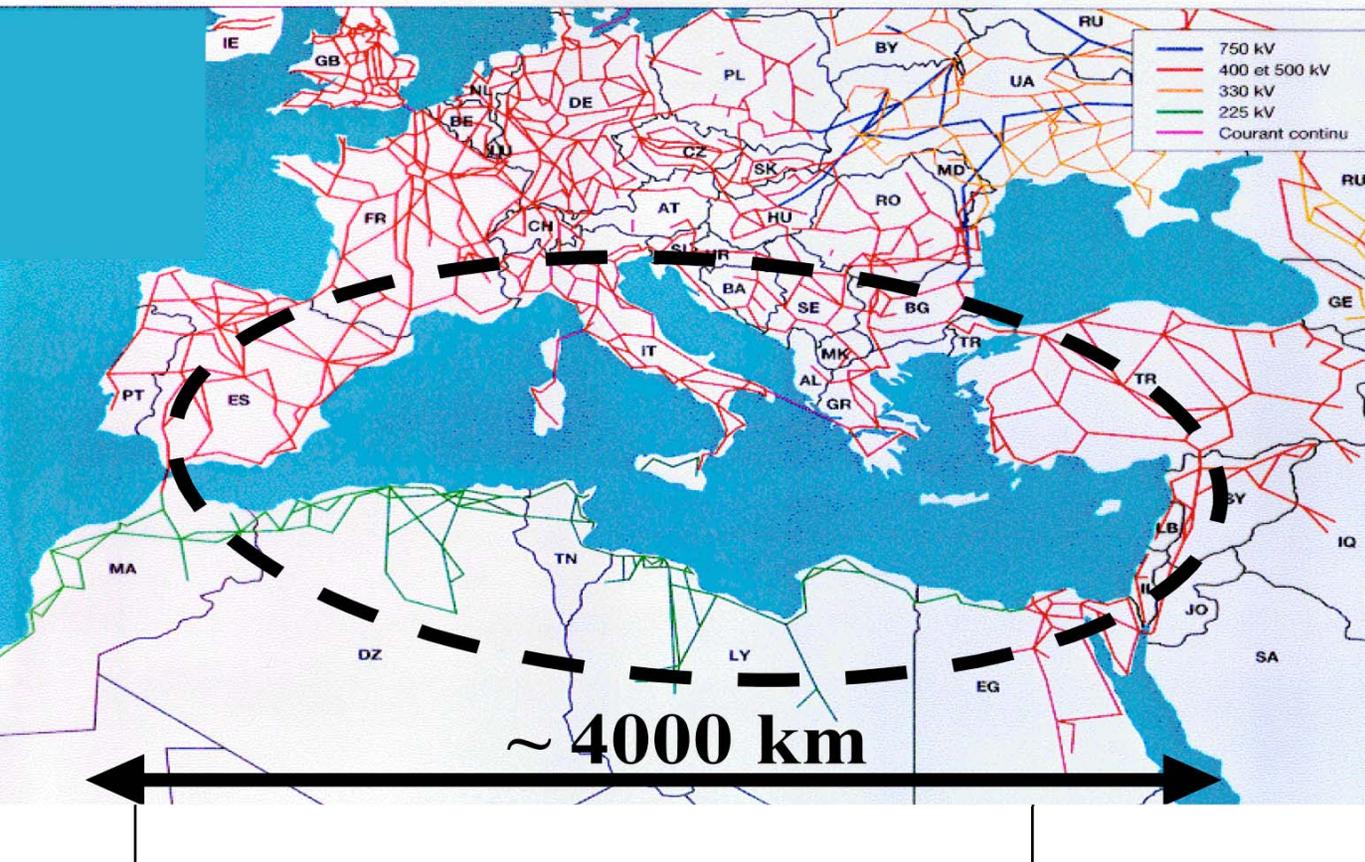


CHALLENGES FOR RTE

- The grids are essential and indispensable to make a success of the low carbon policies of governments :
 - Intermittent renewable generation
 - Demand side management
 - Electric vehicles development
 - Electricity storage
 - Succeed in the european electricity market integration :
 - New interconnexions
 - Coupling of day-ahead markets (West European Backbone from Helsinki to Lisbon)
 - R&D and innovation :
 - Materials and technics
 - Smart metering and smart grids
- ➔ Need to have a fair and smart regulation to finance the projects for the general interest !



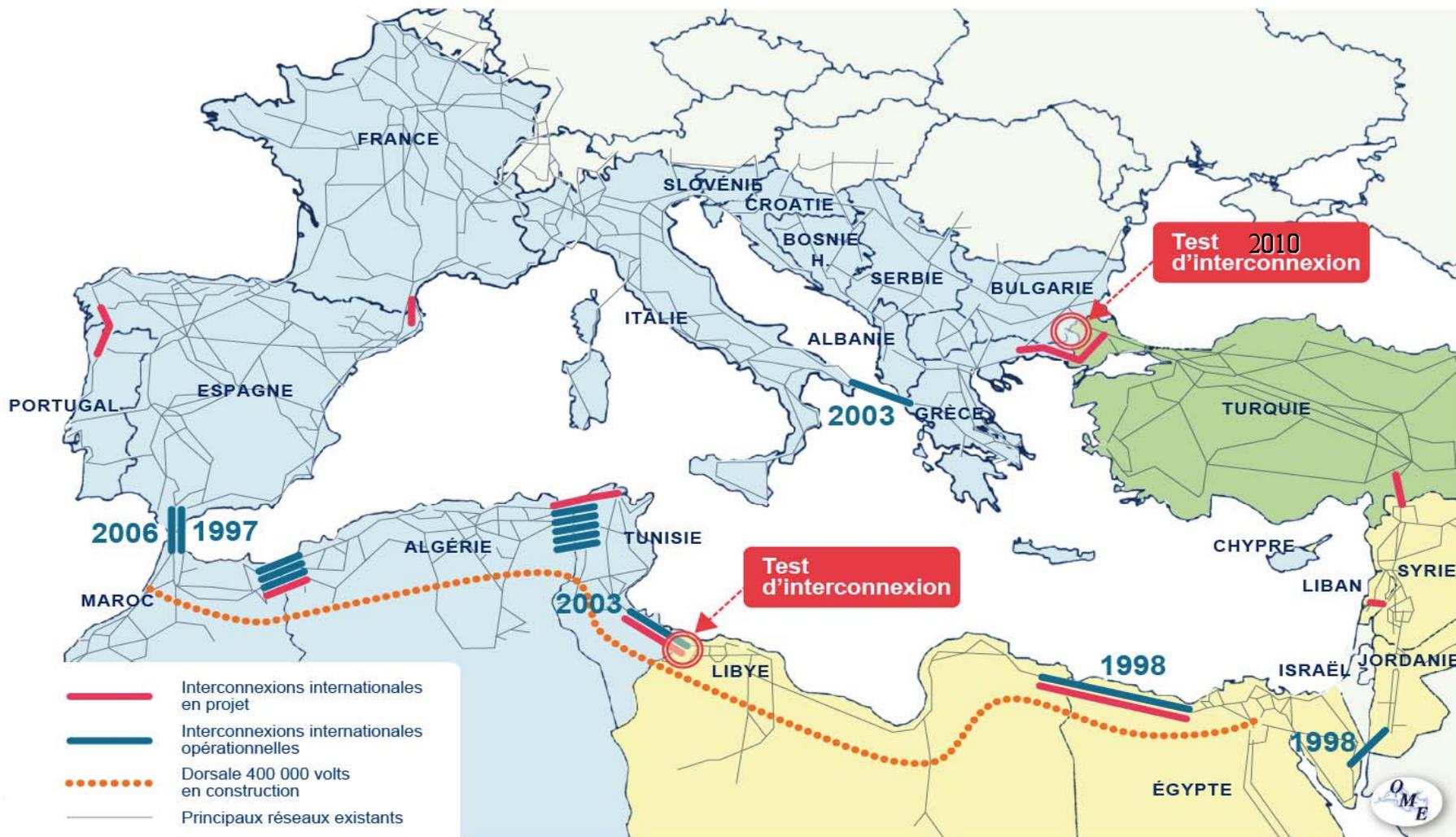
What does MEDRING mean?



- the Mediterranean Electricity Ring is the sequence of the various national networks bordering the Mediterranean shore which are interconnected together. Then they form a kind of oval (about 4000 km long, 2000 km high) around the Mediterranean Sea



LA BOUCLE ÉLECTRIQUE MÉDITERRANÉENNE





THE RTE Group

- Besides the main activities, several subsidiaries of RTE are working :
 - Companies created with other TSOs
 - CORESO (UK, Belgium, France)
 - CASC (Benelux, France, Allemagne)
 - Deregulated activities :
 - Telecom : @rteria
 - PEXS : HGRT (Powernext), Belpex
 - Expertise and consulting : RTE International



The RTE International activities

- Expertise activities :
 - Live working
 - Regulatory framework
 - Training : transmission and system
 - Etc.
- Around the Mediterranean Sea :
 - Algeria
 - Morocco
 - Libya
 - Turkey
- But also in Middle-East (Arabia, Emirates) ; Africa (Senegal) and Far-East (China, Vietnam, Cambodia, Thailand, Malaysia)

RTE International an expertise in the service of the industry of grids



CONCLUSION

- For all the grid industry in the world, the main challenges are :
 - The security of supply of all final consumers,
 - The quality level of the electricity,
 - The support of low carbon policies
- ➔ The need to develop the infrastructures the smart tools to manage a grid and smart market to improve the efficiency.
- ➔ The need to invest in infrastructures and new technologies and consequently the need of a smart and fair regulation



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Thank you for your attention !