

European Energy Market 1

European Power Systems

**Studia niestacjonarne II stopnia
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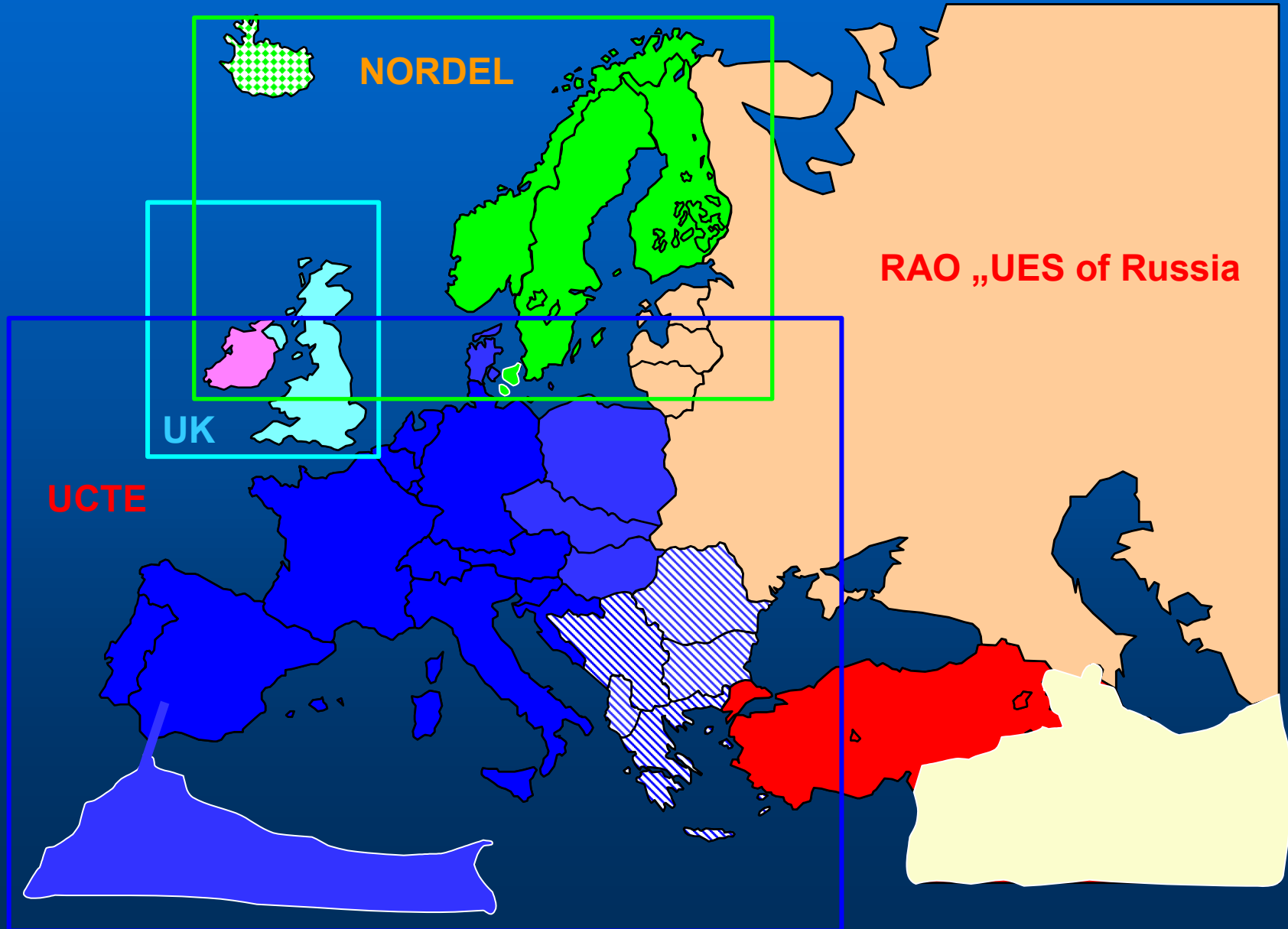
www.i15.p.lodz.pl/~mielczarski/

Lp	List of lectures
1	European Energy Markets
2	Polish Power System
3	Main Market Rules - Balancing
4	Electricity Trade - Power Exchange
5	Customers - TPA
6	Subsidized Markets
7	Cost of Electricity
8	Energy Mix
9	EU Emission Trade System
10	Cross border trading

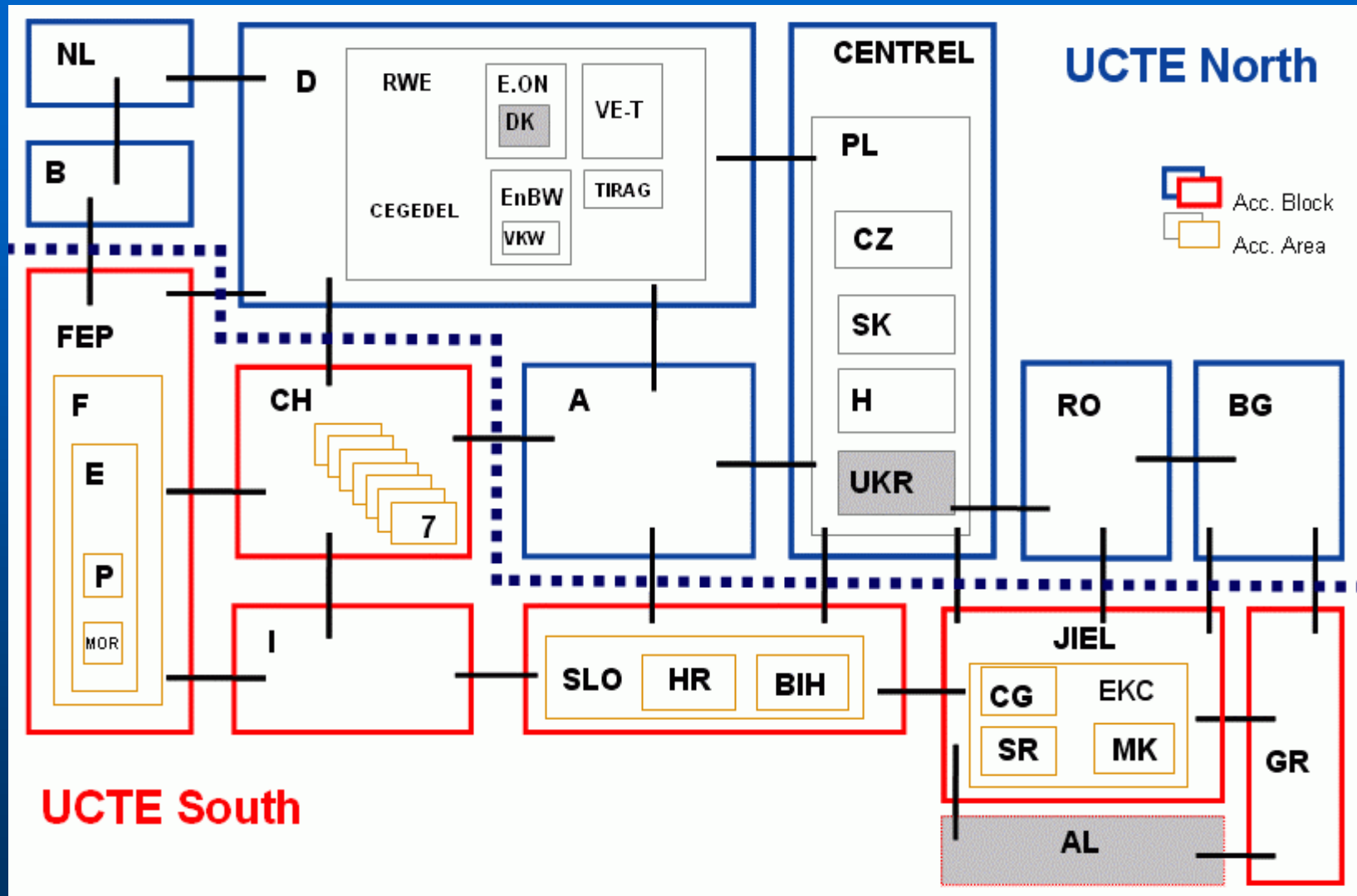
Topics

- **Interconnected power systems**
- **Control zones**
- **Generation capacity**
- **Power reserve**
- **Power exchanges**
- **Production technologies**
- **The largest power companies**

Interconnected power systems

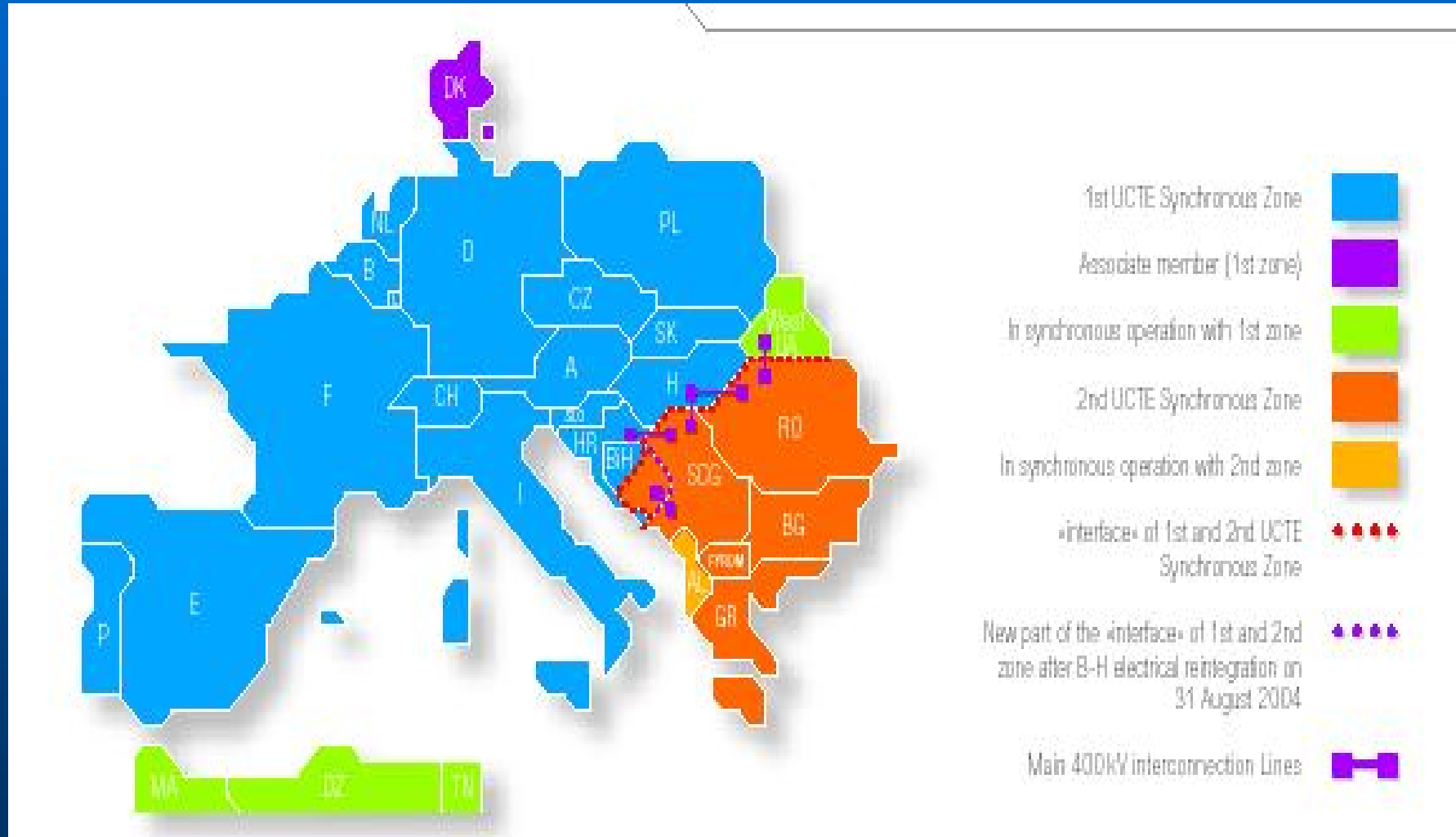


Control zones



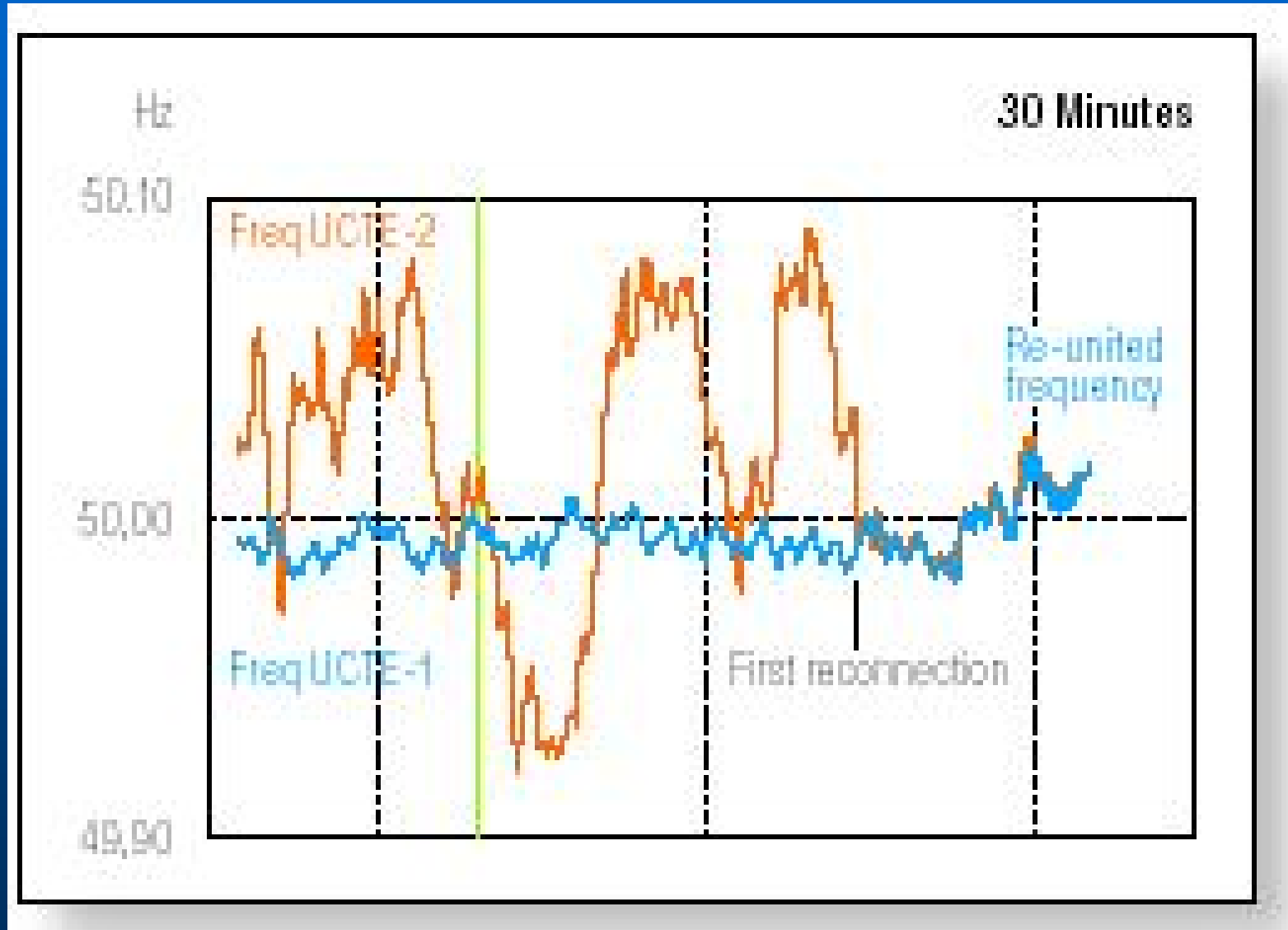
Source: UCTE/ENTSO-E

Synchronisation of a new zone



Source: UCTE/ENTSO-E

Frequency during synchronisation



Source: UCTE/ENTSO-E

Production of electric energy

Electricity

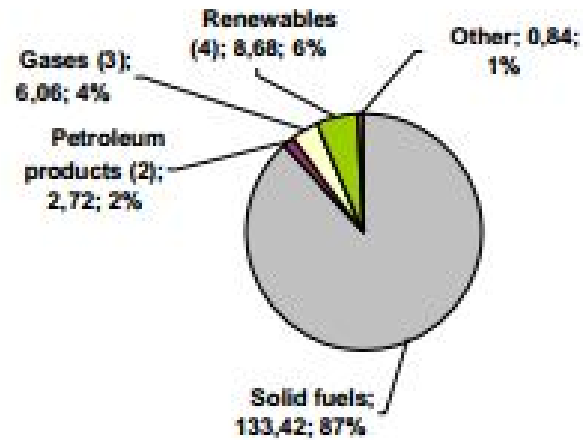
Poland



Poland

Gross Electricity Generation
(in % of TWh)

2009



Total TWh 151,72

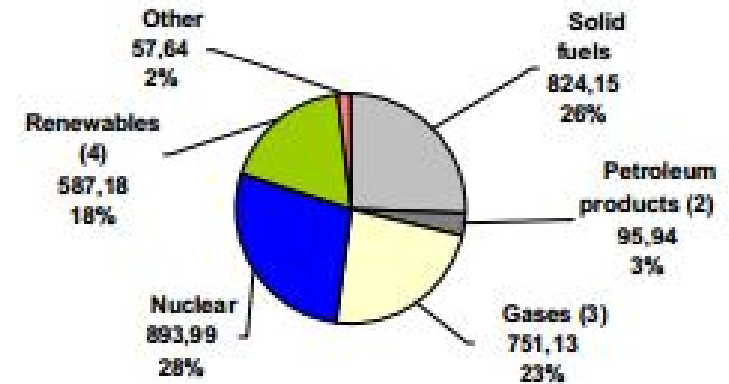
EU-27



EU-27

Gross Electricity Generation
(in % of TWh)

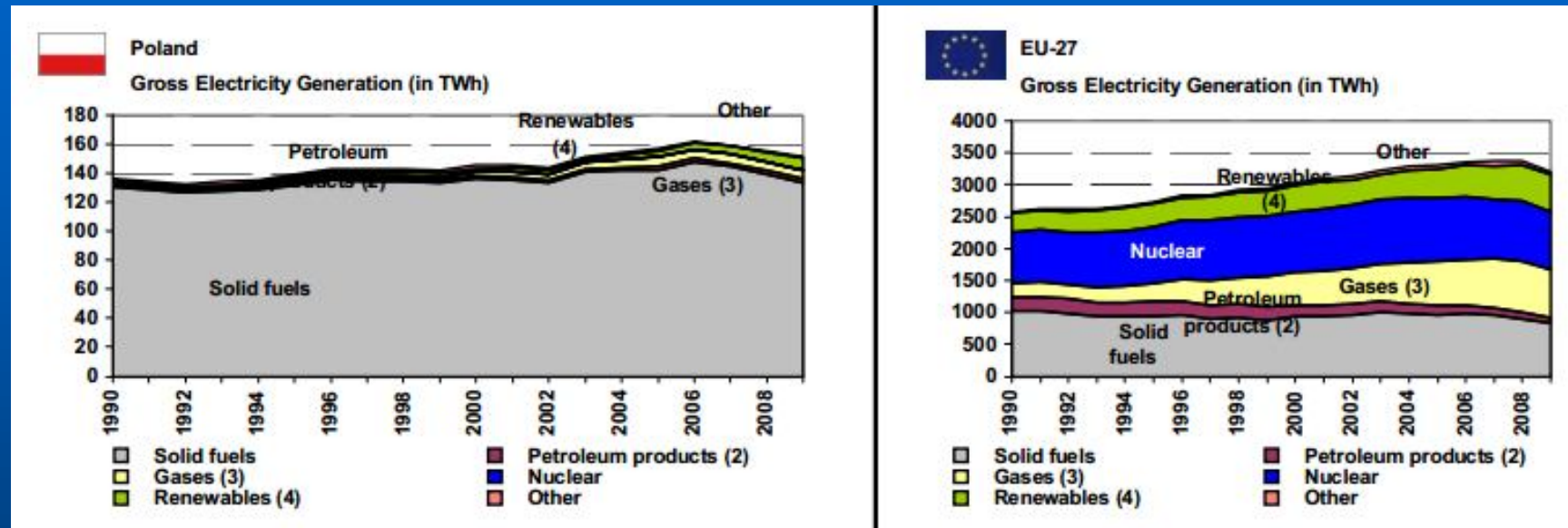
2009



Total TWh 3210,03

Source: European Commission

Electricity production (2)



Source: European Commission

Gross energy consumption

Gross Inland Consumption

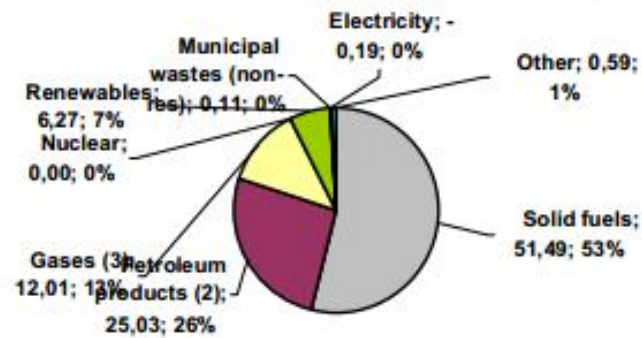
Poland



Poland

Gross Inland Consumption
(Energy mix in % of total Mtoe)

2009



Total Mtoe 95,31

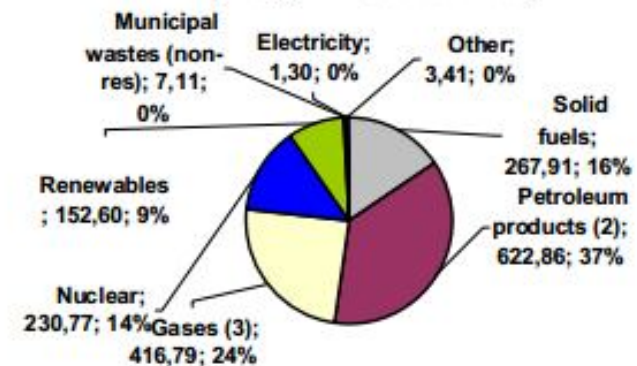
EU-27



EU-27

Gross Inland Consumption
(Energy mix in % of total Mtoe)

2009

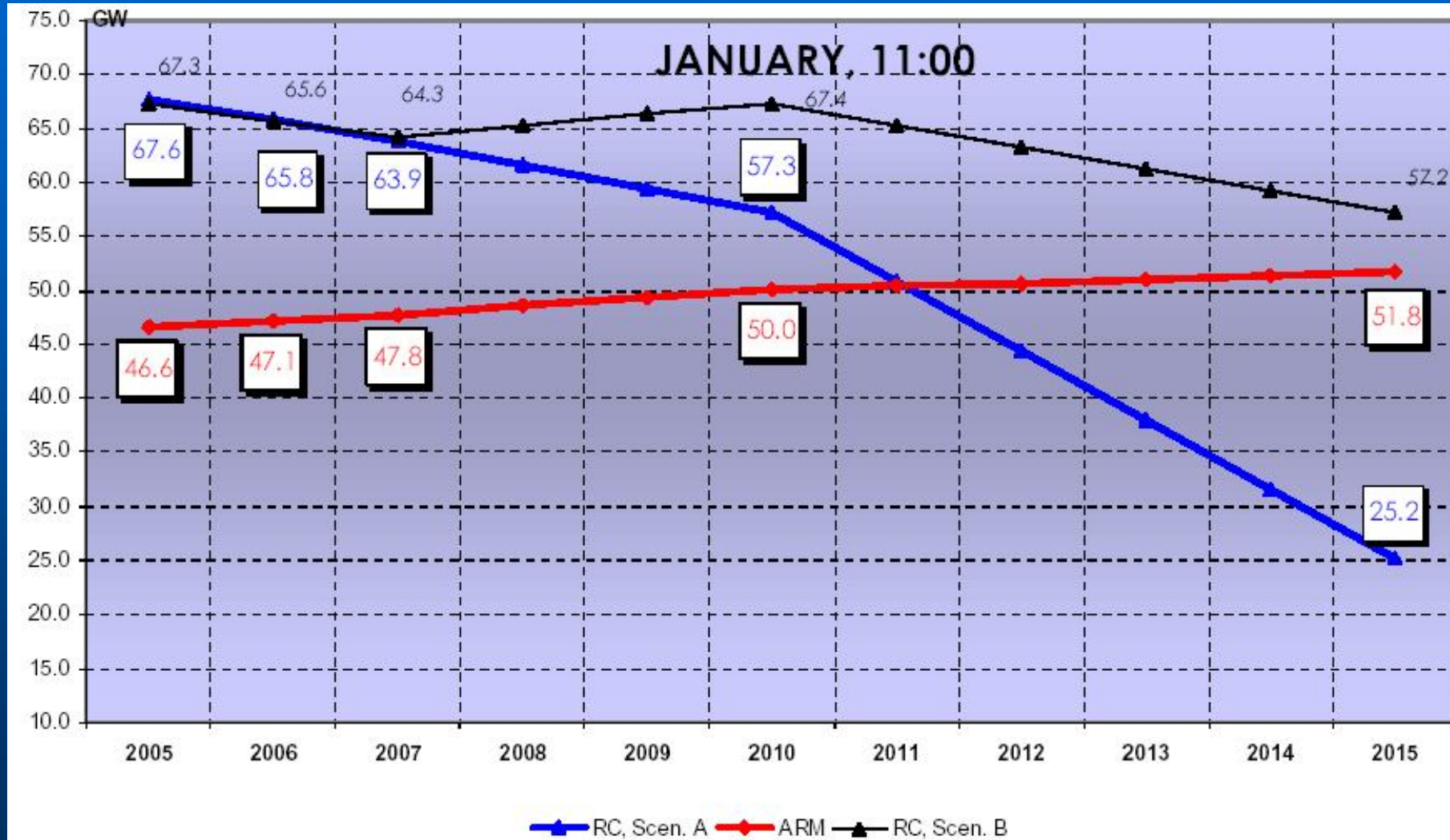


Total Mtoe 1702,75

Source: European Commission

Power reserves in Europe

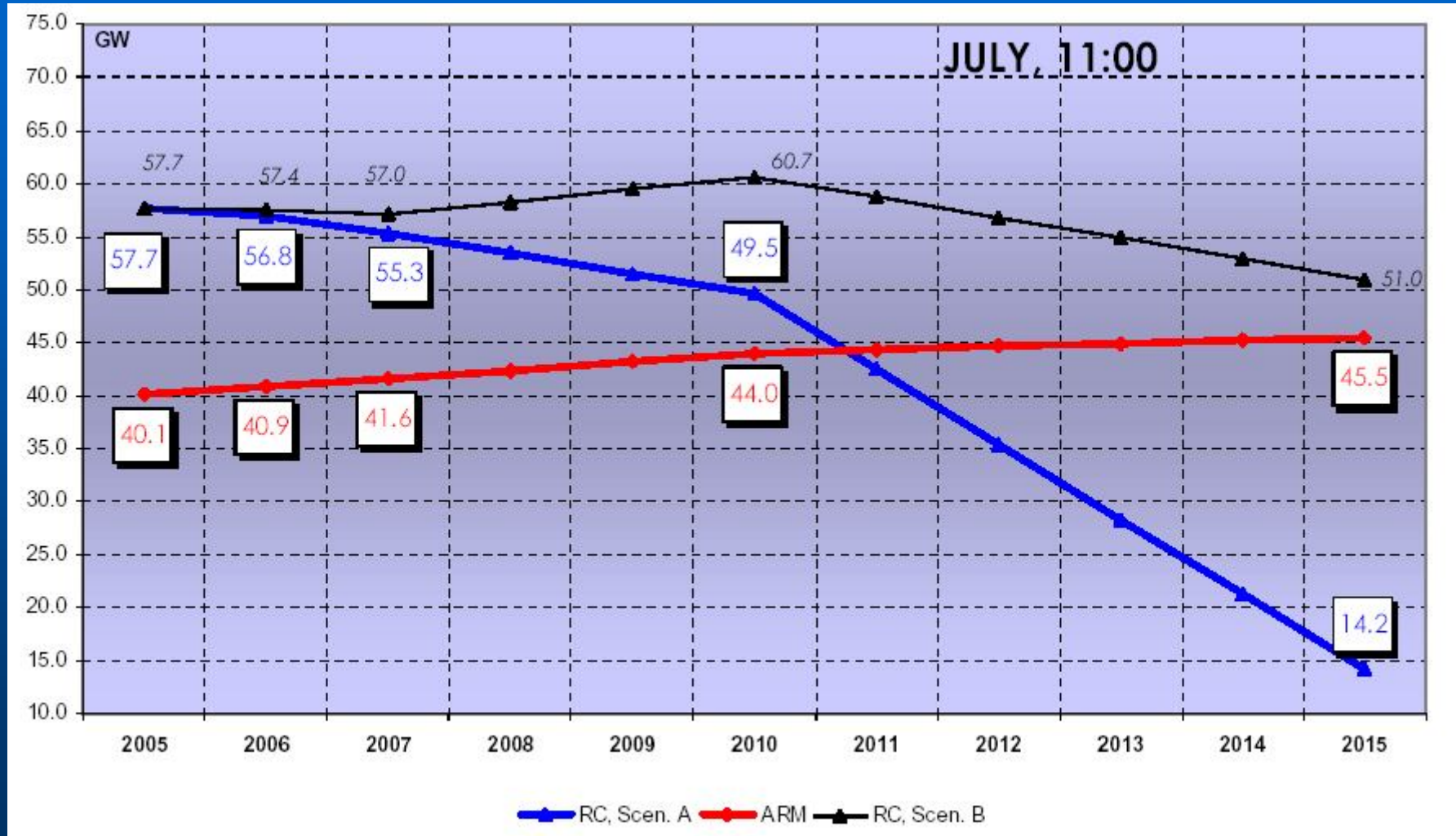
RC = Remaining Capacity; ARM = Adequacy Reliability Margin



Source: UCTE/ENTSO-E

Power reserves in Europe

RC = Remaining Capacity; ARM = Adequacy Reliability Margin

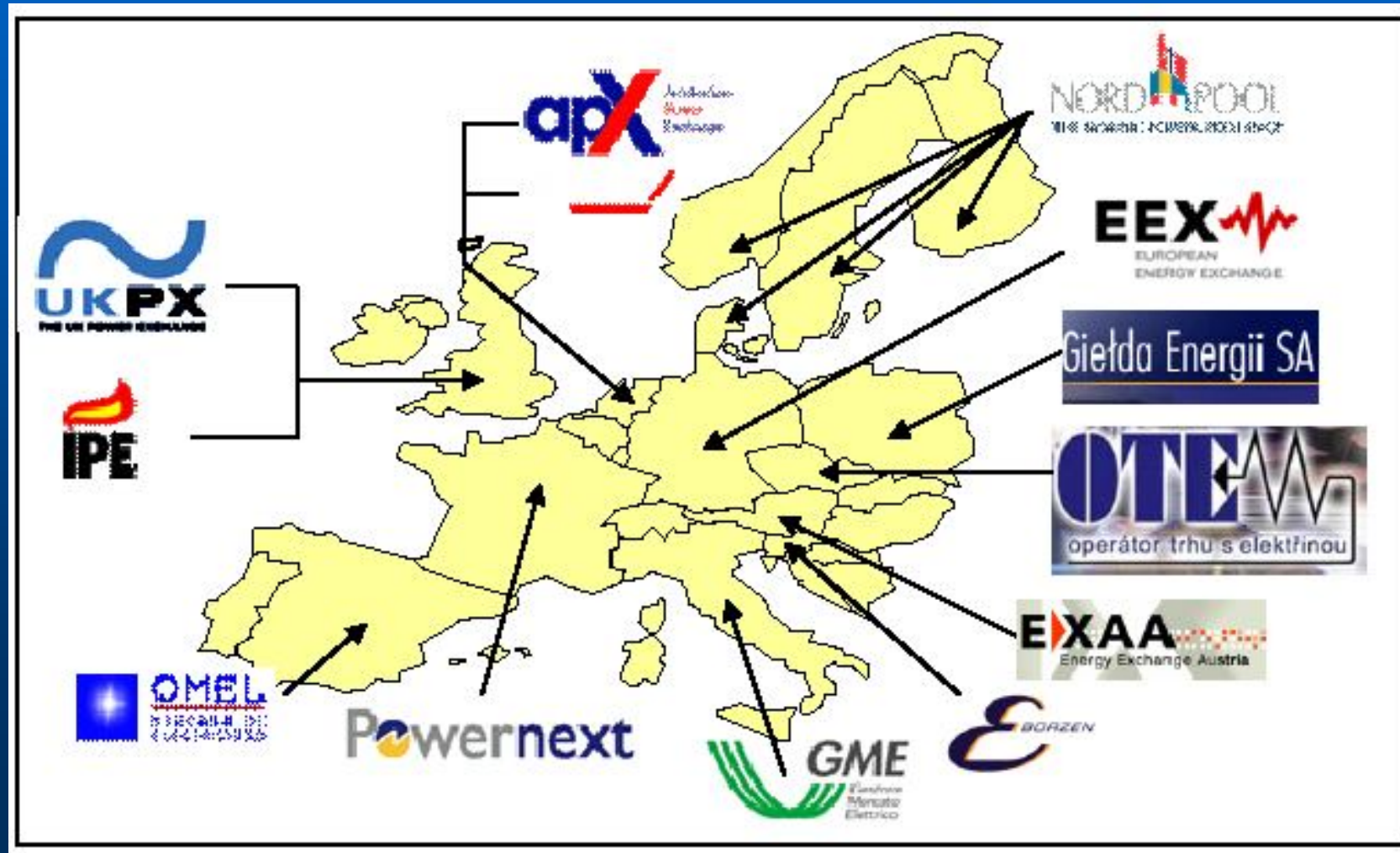


Source: UCTE/ENTSO-E

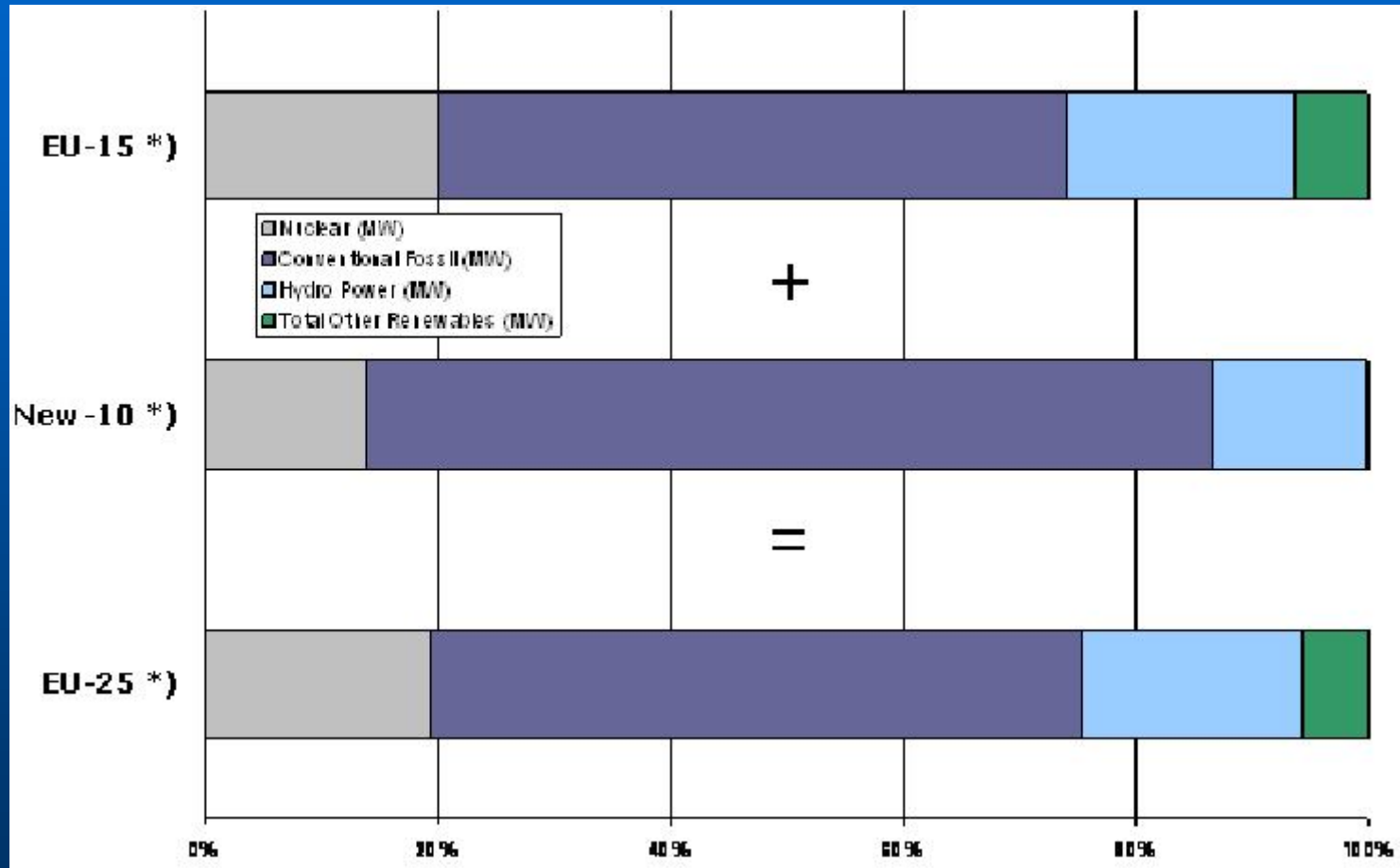
Generating capacity

- *generating capacity* – suma mocy zainstalowanych
- *non-usable capacity* – moce nieosiągalne
- *Overhauls* – moce pozostające w remontach
- *Outages* – prognozowane ubytki mocy na awarie
- *system service reserve* – moce potrzebne na regulację systemu
- *guaranteed capacity* – moc zainstalowana pomniejszona o moce nieosiągalne, remonty, awarie i regulację systemu

European Power Exchanges

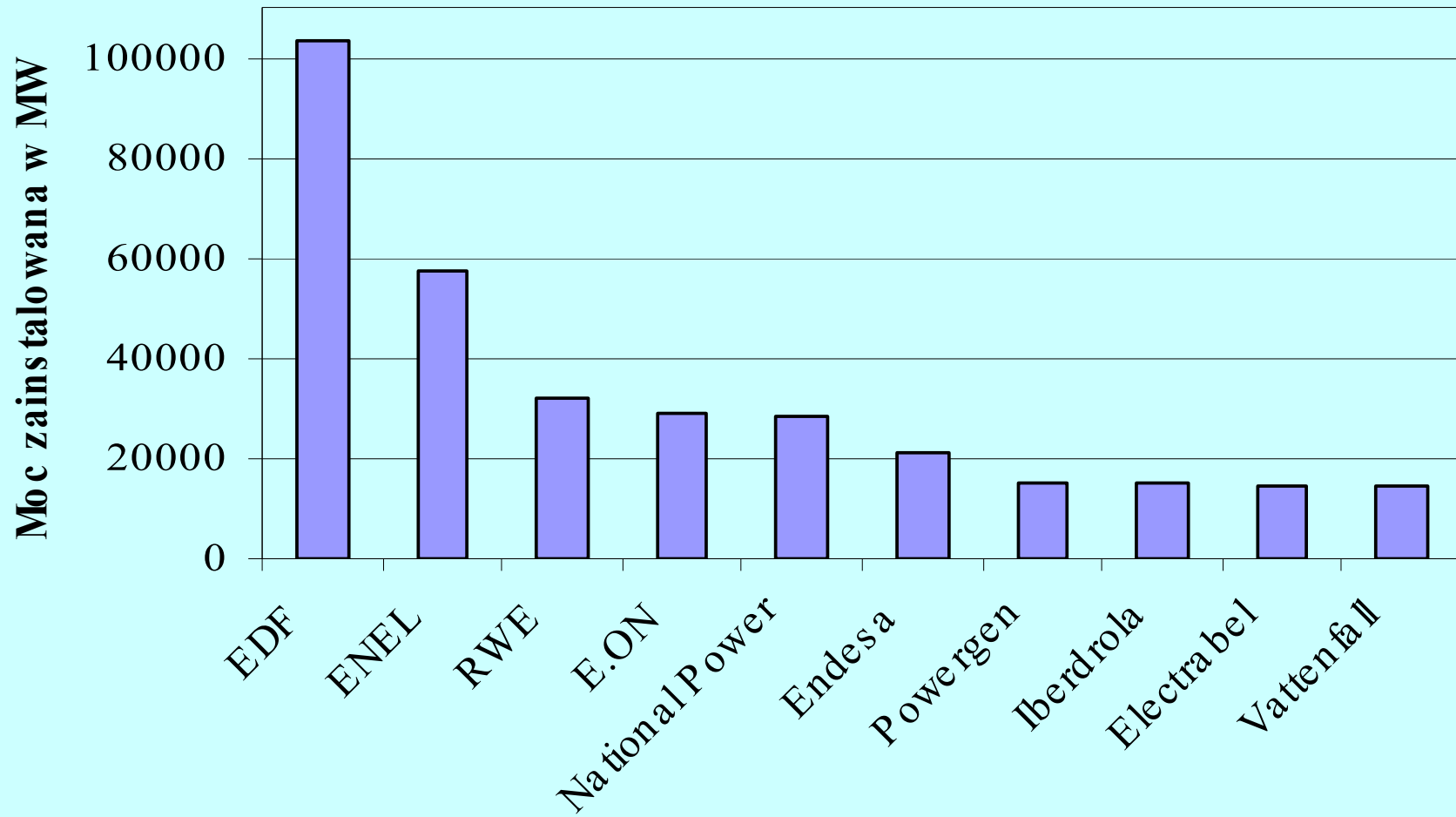


Power production technologies



Source: European Commission

The largest power companies



Major European regulation

- **The first market Directive EC/92/1996**
- **The second market Directive EC/54/2003, concerning the common rules for the internal market in electricity. New 2009/72/EC**
- **The regulation 1228/2003, imposing the trade of cross border capacities, opens electricity markets to international trade.**

Implementing Directives into national laws

- The member states have to ensure that the power companies operate in accordance with the principles of this Directive.
- This means that the member states have to adopt the principles of the Directive to their national regulations, such as Energy Laws and ordinances and other regulations.