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Zoran V. STOSIC
Nuclear Prospects in Europe
Zagreb, CROATIA, April 22nd 2009

Nuclear Prospects in Europe



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HND Forum
Zagreb, CROATIA, April 22nd 2009

Topics

- **State of Affairs**
- **The Energy Challenge**
- **Worldwide Nuclear Status & Outlook**
- **European Energy Mix**
- **Nuclear Complexity of EU–27**
- **View on Nuclear Energy in Europe**
- **South–East Region**
- **Outlines of Selected Countries**



➤ **State of Affairs**

➤ The Energy Challenge

➤ Worldwide Nuclear Status & Outlook

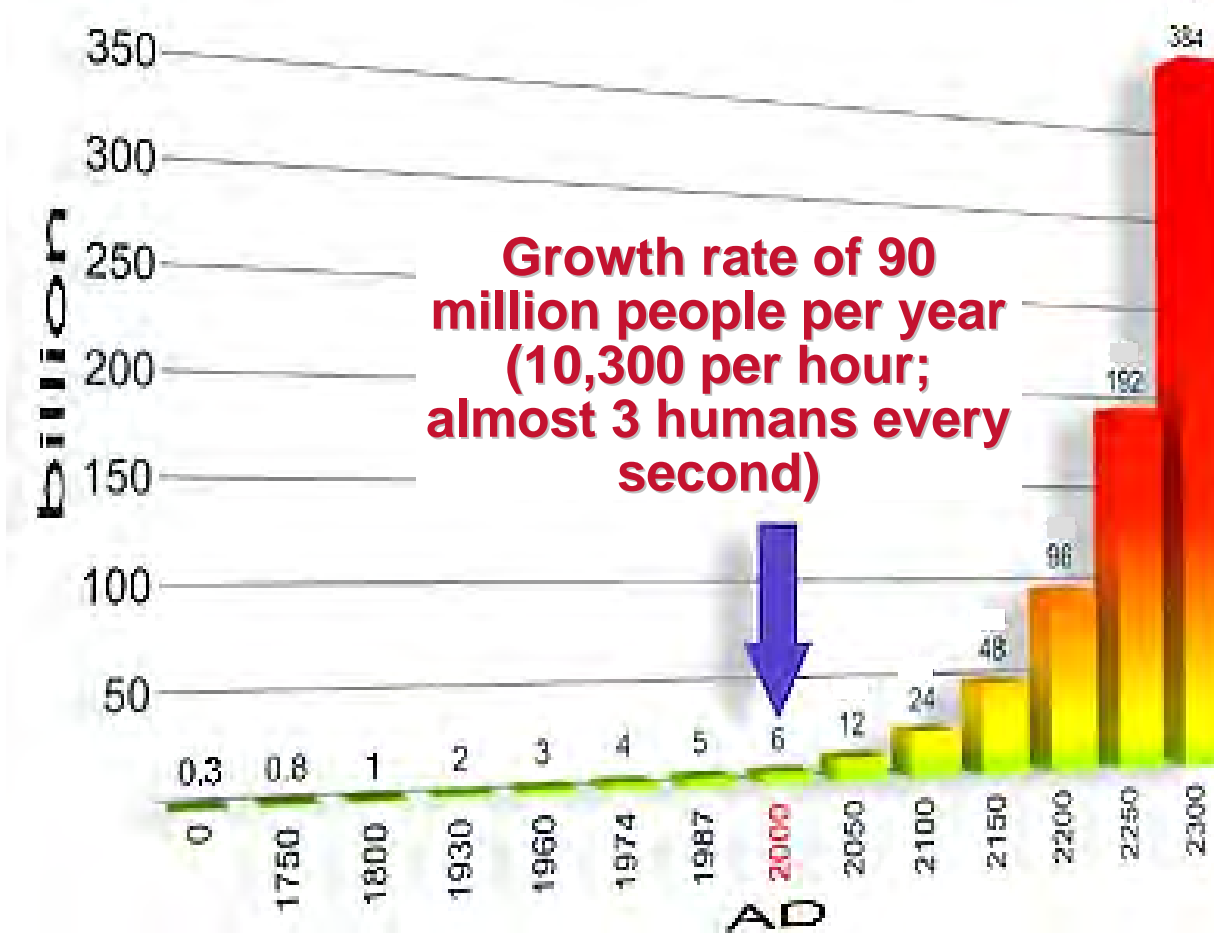
➤ European Energy Mix

➤ Nuclear Complexity of EU-27

➤ View on Nuclear Energy in Europe

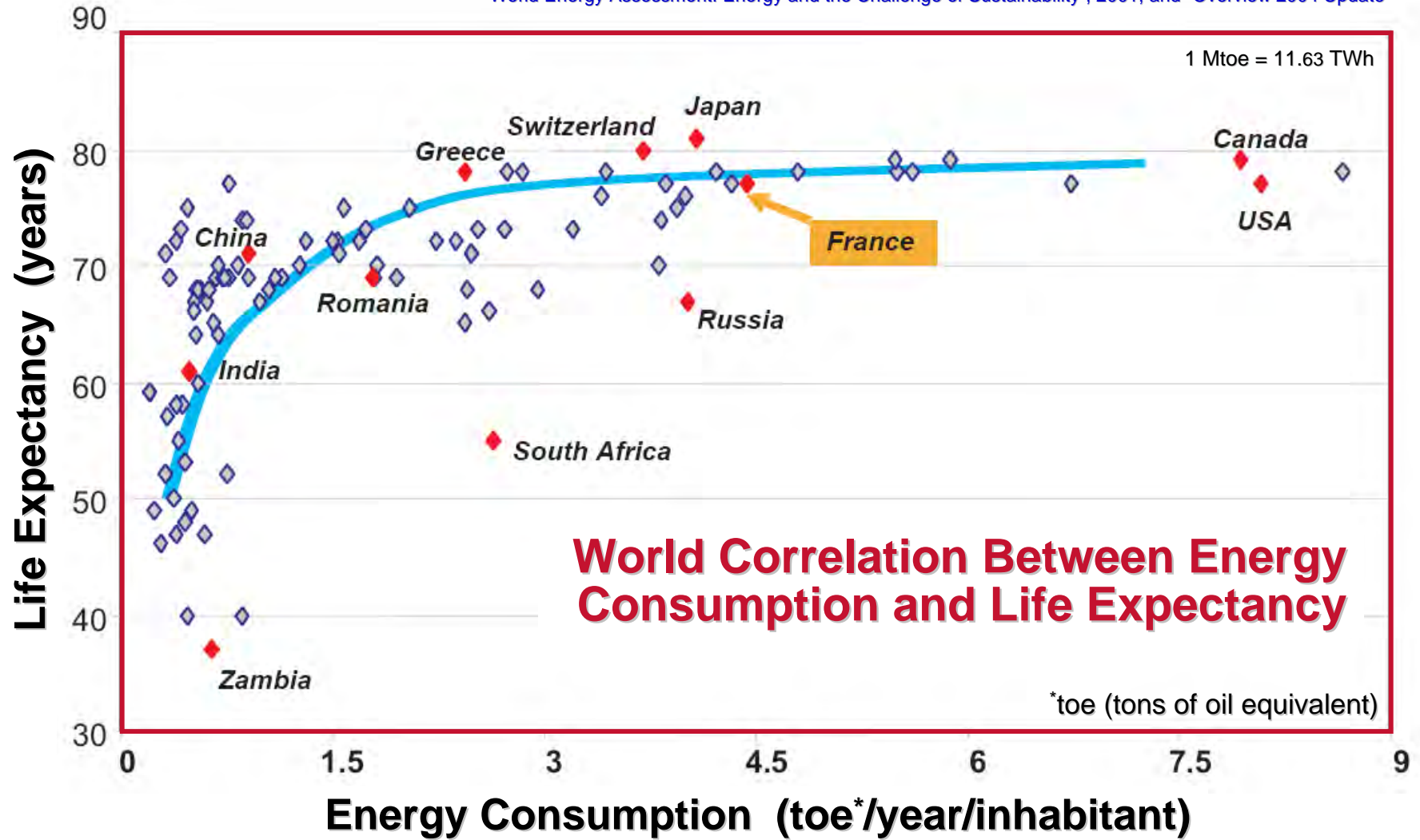
➤ South-East Region

➤ Outlines of Selected Countries



- ❑ Mid April 2009 almost 7 billion people live on our Planet — out of which **nearly 2 billion have no access to electricity;**
- ❑ **Global population is rising toward 9 to 10 billion people (even 12 billion possible) by 2050.**

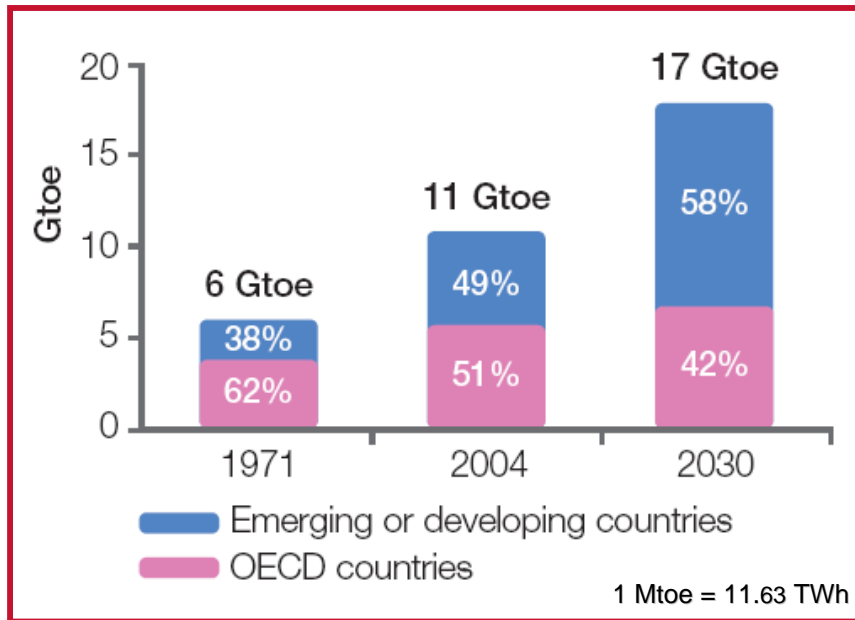
Source: UN Development Program, "World Energy Assessment: Energy and the Challenge of Sustainability", 2001, and "Overview 2004 Update"



No Development Without Energy

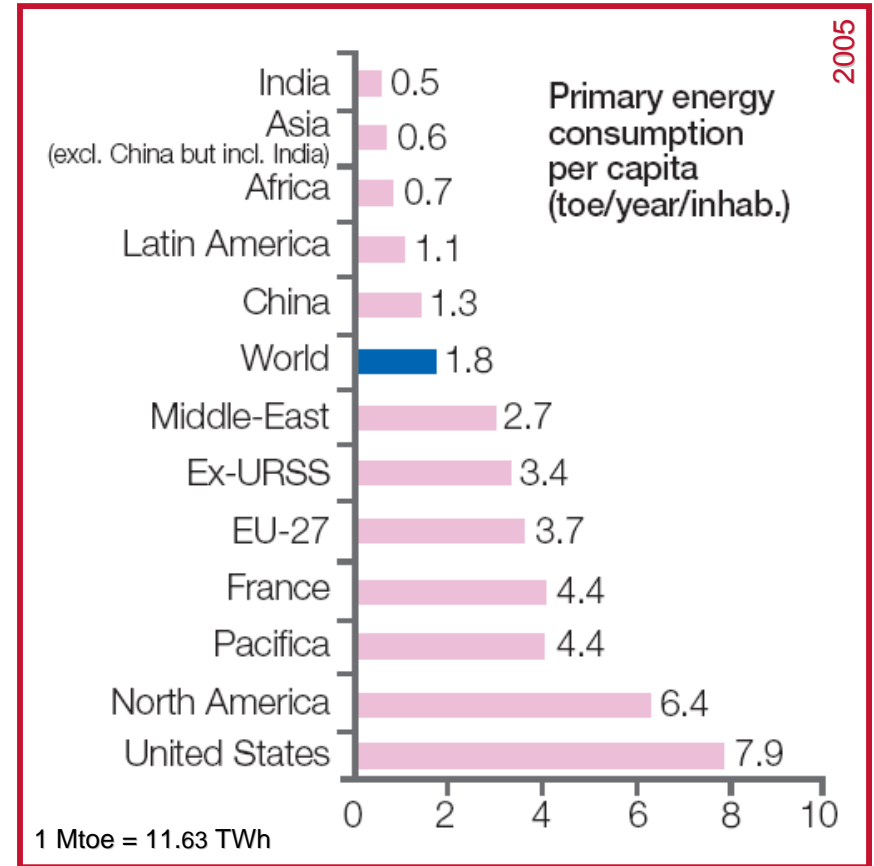
Energy contributes to human development;

As the world's population increases, the demand for energy also increases



Source: "World Energy Outlook", IEA 2006

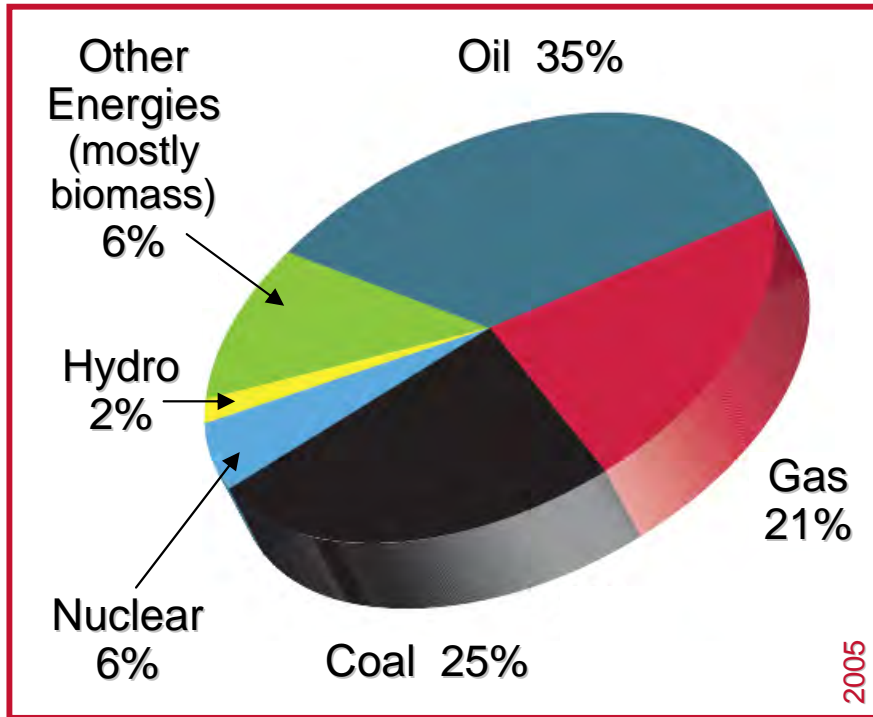
Forecast Trend of Primary Energy Consumption ("Business As Usual" Scenario)



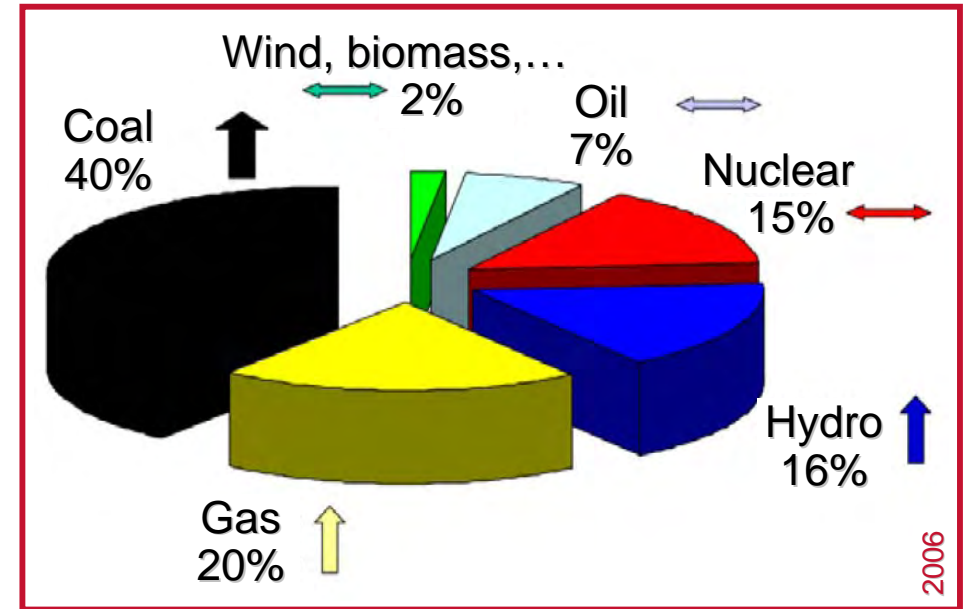
Source: IEA 2007 – "Key World Energy Statistics"
"Energy Balances of Non-OECD Countries"
"Energy Balances of OECD Countries"

Differences in Primary Energy Consumption

World Energy Consumption



Source: "Key World Energy Statistics", IEA 2007

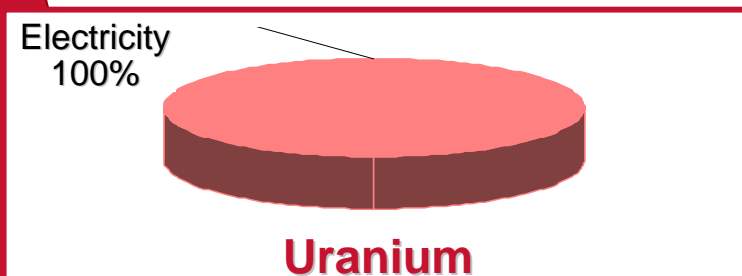
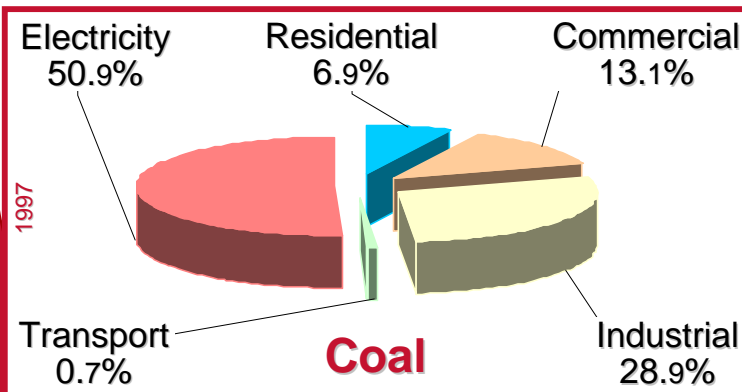
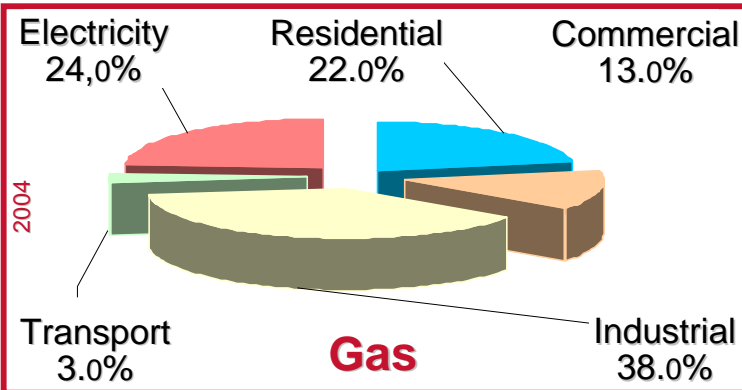
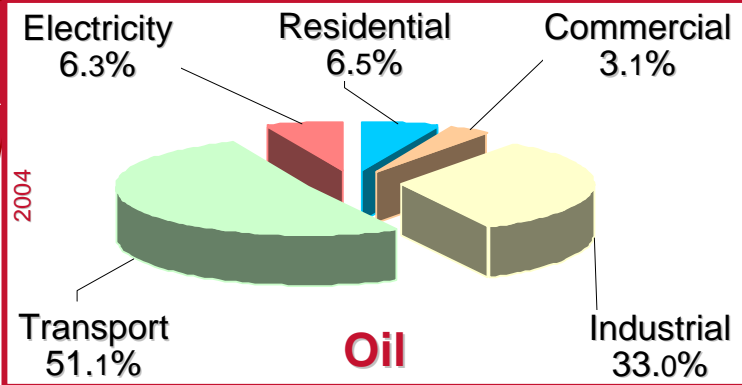


Primary Energy Supply

Electricity Production Share

- ❑ **General energy consumption is expected to at least double by 2030 and to probably triple by 2050;**
- ❑ **Electricity consumption is estimated to grow much faster — by a factor of 5 to 7 by 2050.**

Non-Renewables



Global Power Consumption by Sectors (without Heating and Military Sectors)

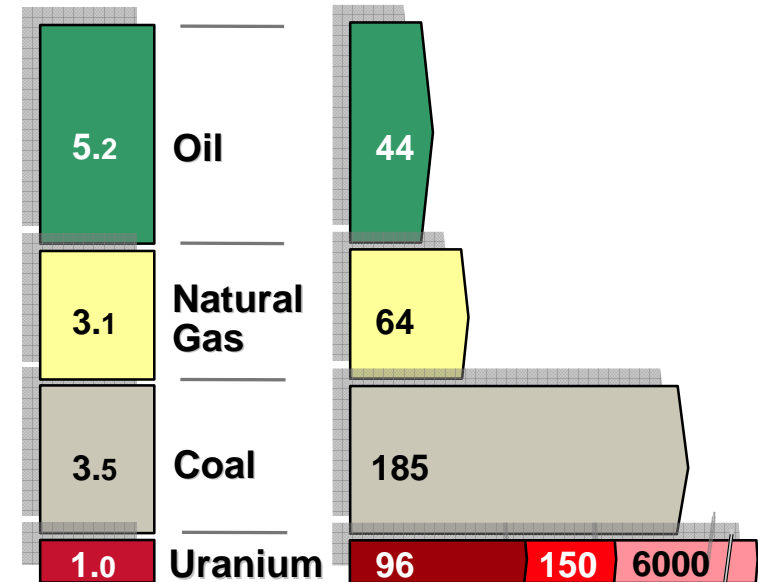
generated by non-renewables

(producing about 91% of today's total world energy consumption)
 illustrates where the nuclear power could replace the existing fossil fuels and what is the extent of sharing

Source: International Energy Outlook 2007, DOE/EIA-0484, May 2007;
 DOE, International Energy Annual 2004, EIA, May-Jul 2006;
 EIA, System for the Analysis of Global Energy Markets, EIA 2007;
 EIA, International Petroleum (Oil) Reserves and Resource, 2007;
 IEA, Oil Market Report, pp. 14, IEA May 2006;
 INTUSER: Application of Fossil Energy, 2008;
 The Oil Daily, Vol. 56, No. 100, pp.4, May 2006;
 Oil & Gas Journal, Vol. 104, No. 47, pp. 24-25, December 2006

Consumption in billion TCE (Tons of Coal Equivalent)

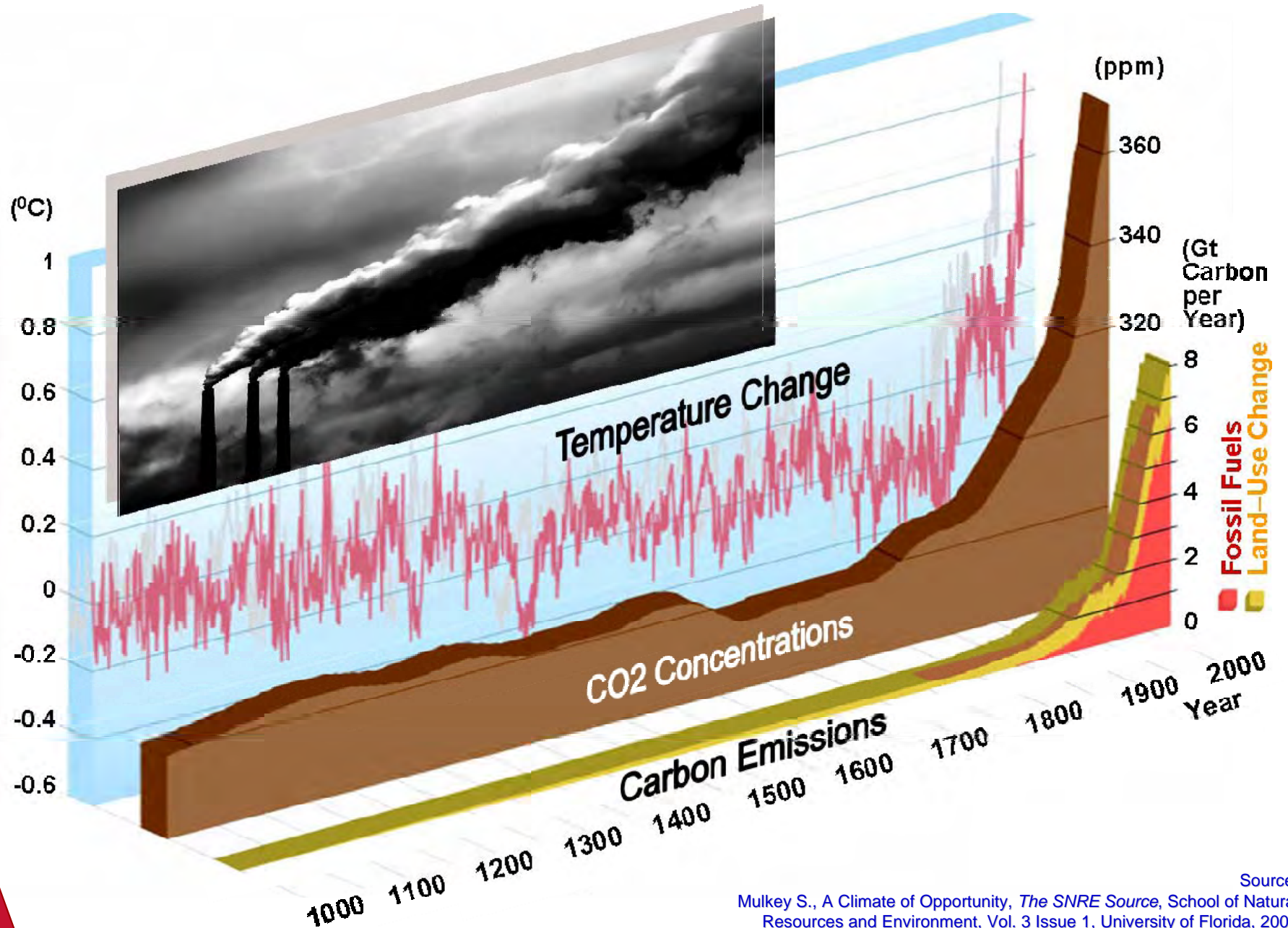
Depletion = $\frac{\text{Energy reserve}}{\text{Consumption p.a.}}$



1 TCE = 0.6667 toe
 1 Mtoe = 11.63 TWh

excl. fuel recycling with fuel recycling used in fast breeders

Climate Change — Global Warming



Source: Mulkey S., A Climate of Opportunity, *The SNRE Source*, School of Natural Resources and Environment, Vol. 3 Issue 1, University of Florida, 2007



➤ State of Affairs

➤ **The Energy Challenge**

➤ Worldwide Nuclear Status & Outlook

➤ European Energy Mix

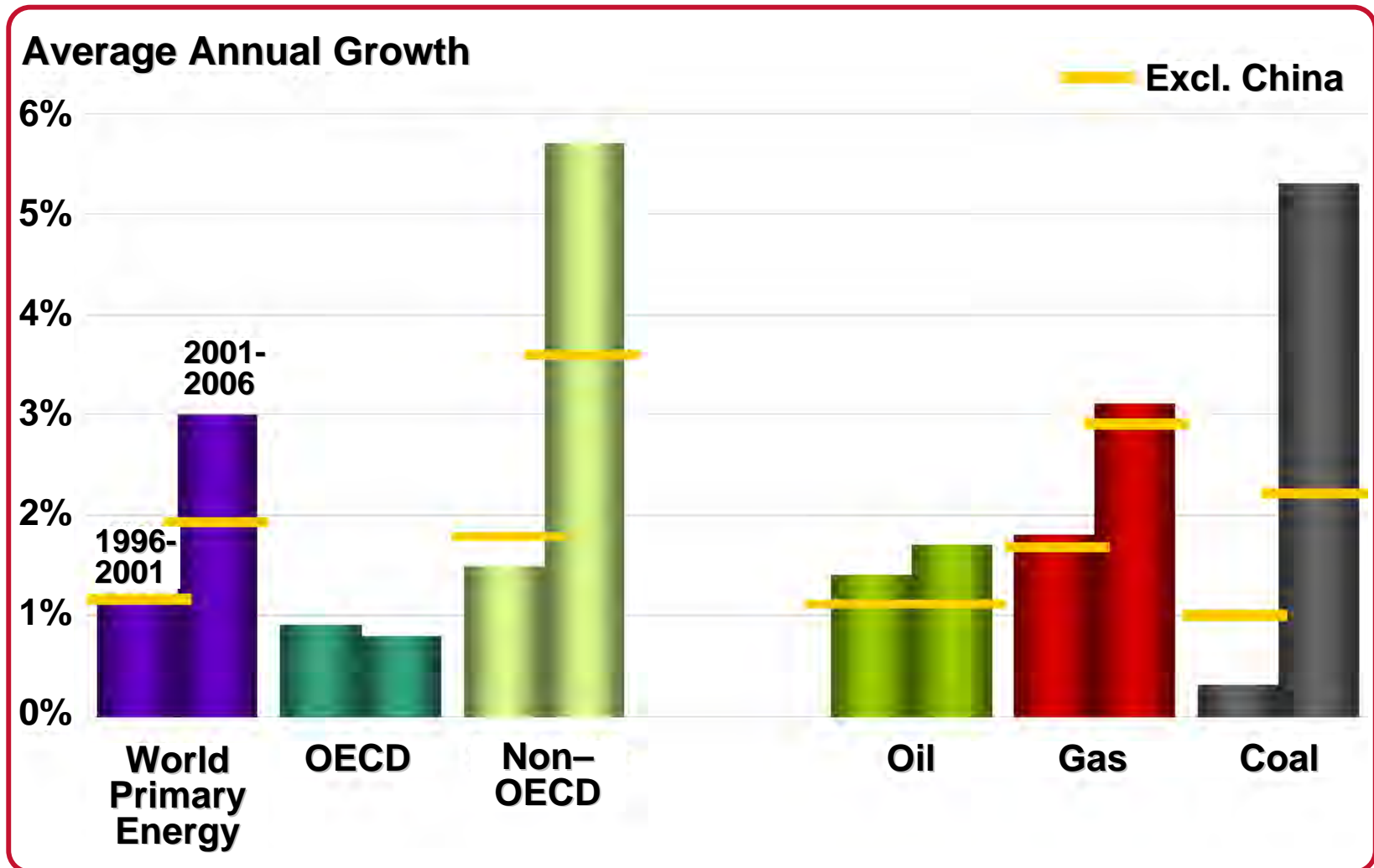
➤ Nuclear Complexity of EU-27

➤ View on Nuclear Energy in Europe

➤ South-East Region

➤ Outlines of Selected Countries

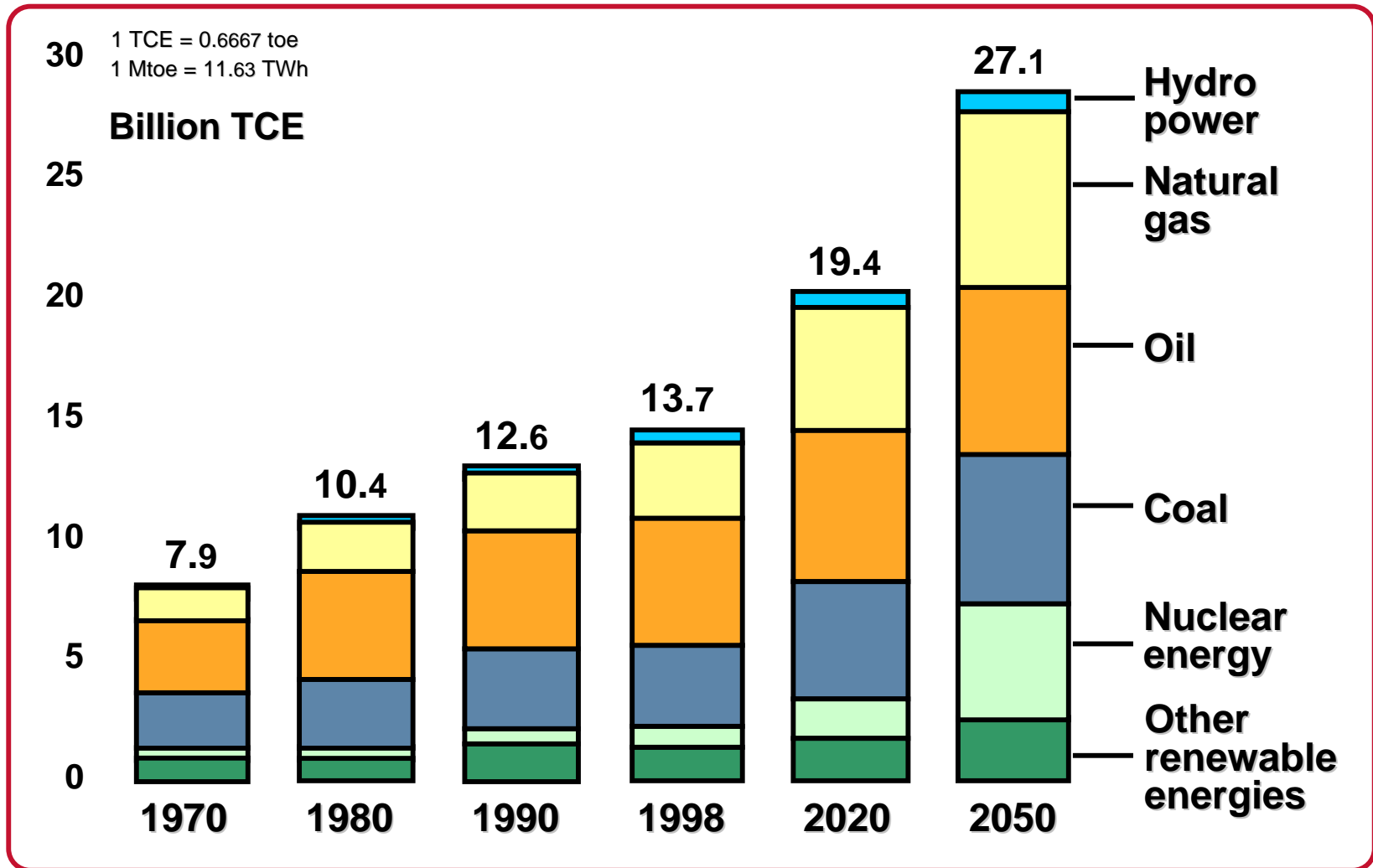
Primary Energy Consumption Growth in a Decade



Source: Rühl C., "Energy in Perspective", BP Statistical Review of World Energy 2007, London, June 12, 2007

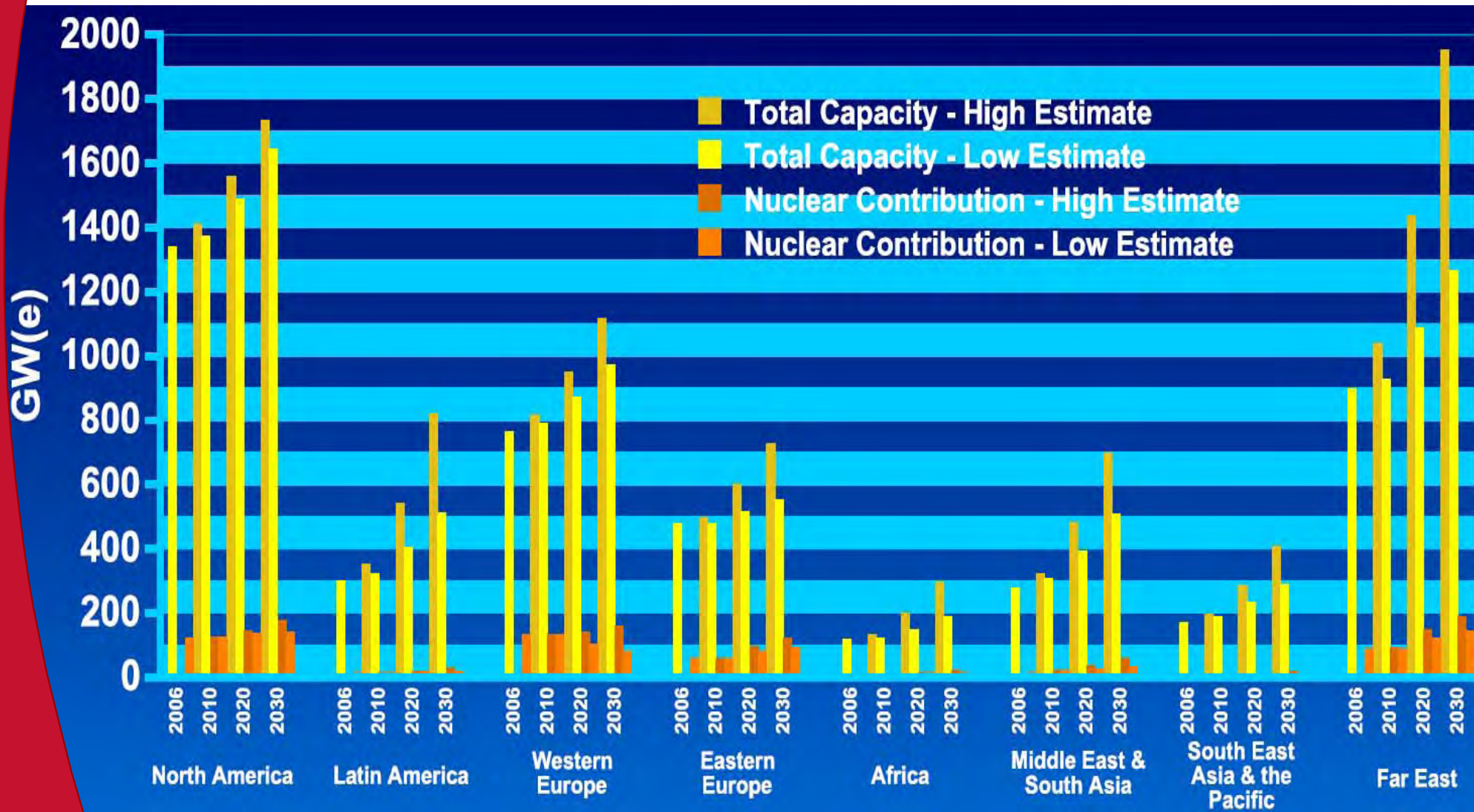
World recorded annual growth of about 3% — almost 2% in the last 5 years — non-OECD countries recorded almost 4% in last 5 years

Increasing Primary Energy Demand



World Primary Energy Demand
(WEC – Reference Scenario)

Increasing Electricity Consumption



Source: „Energy, Electricity and Nuclear Power for the Period up to 2030”, IAEA, 2007

Nuclear and Total Electricity Generating Capacity up to 2030

Industrialized Countries

(Europe, US, Canada, Japan, Korea)

Energy independence strategies

Desire for stable and competitive energy

Environmental concerns regarding CO₂ emissions

Emerging Countries

(China, India, Brazil, South Africa)

Support strong economic and demographic growth generating increased demand for energy

The Nuclear Renaissance is on its way right NOW

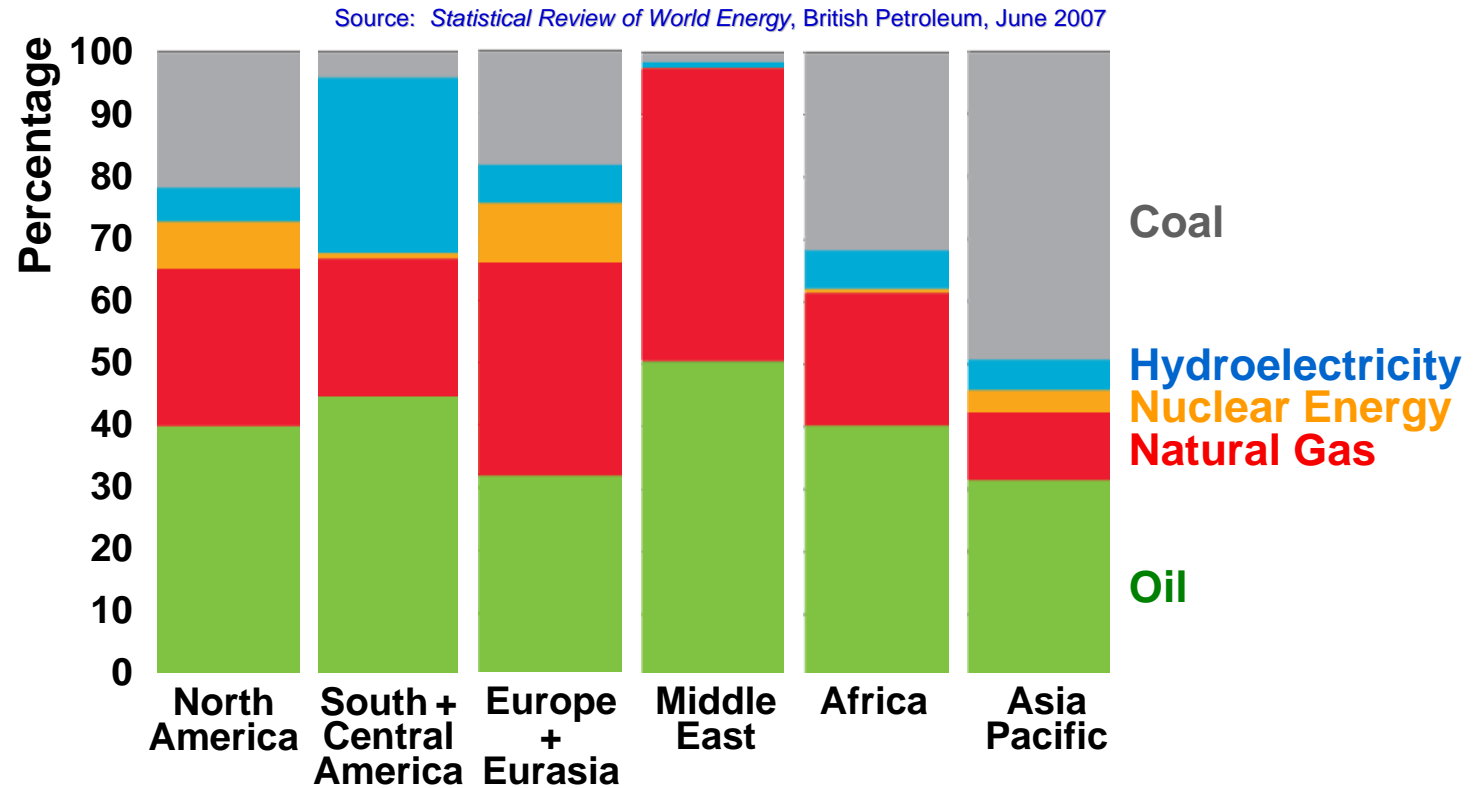




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Security of Energy Supply

The emphasis on security of energy supply is very important for the nuclear movement as well



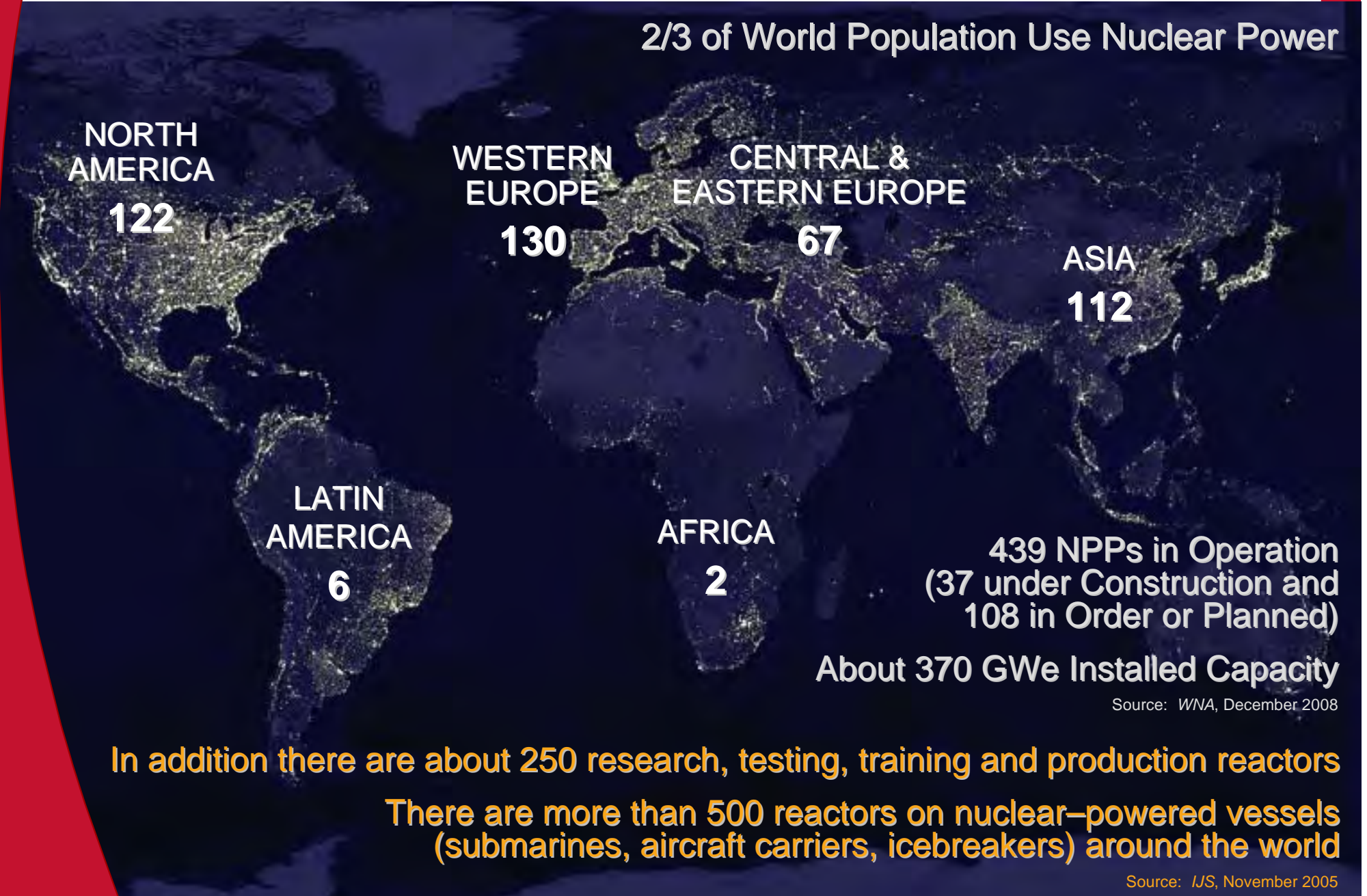
Primary Energy Consumption Pattern by Areas in 2007

Oil is the prime energy source, except in Asia Pacific and Europe & Euroasia

Coal dominates in the Asia Pacific region
(Asia Pacific region accounted for 2/3 of global energy consumption growth in 2006)

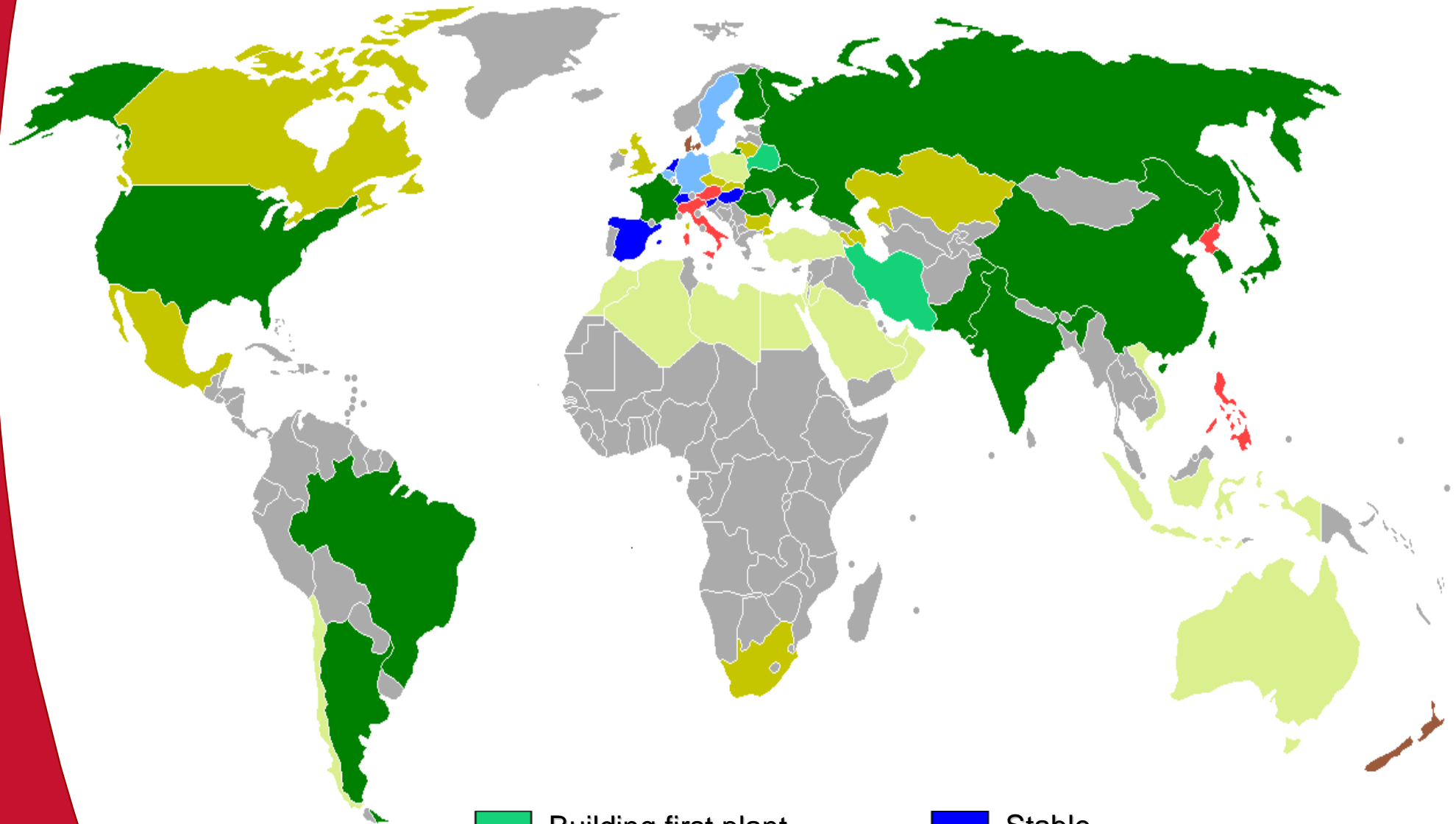
Natural gas is the leading fuel in Europe & Euroasia





2/3 of World Population Use Nuclear Power







Commercial Nuclear Power Plants Worldwide

(End of 2007)

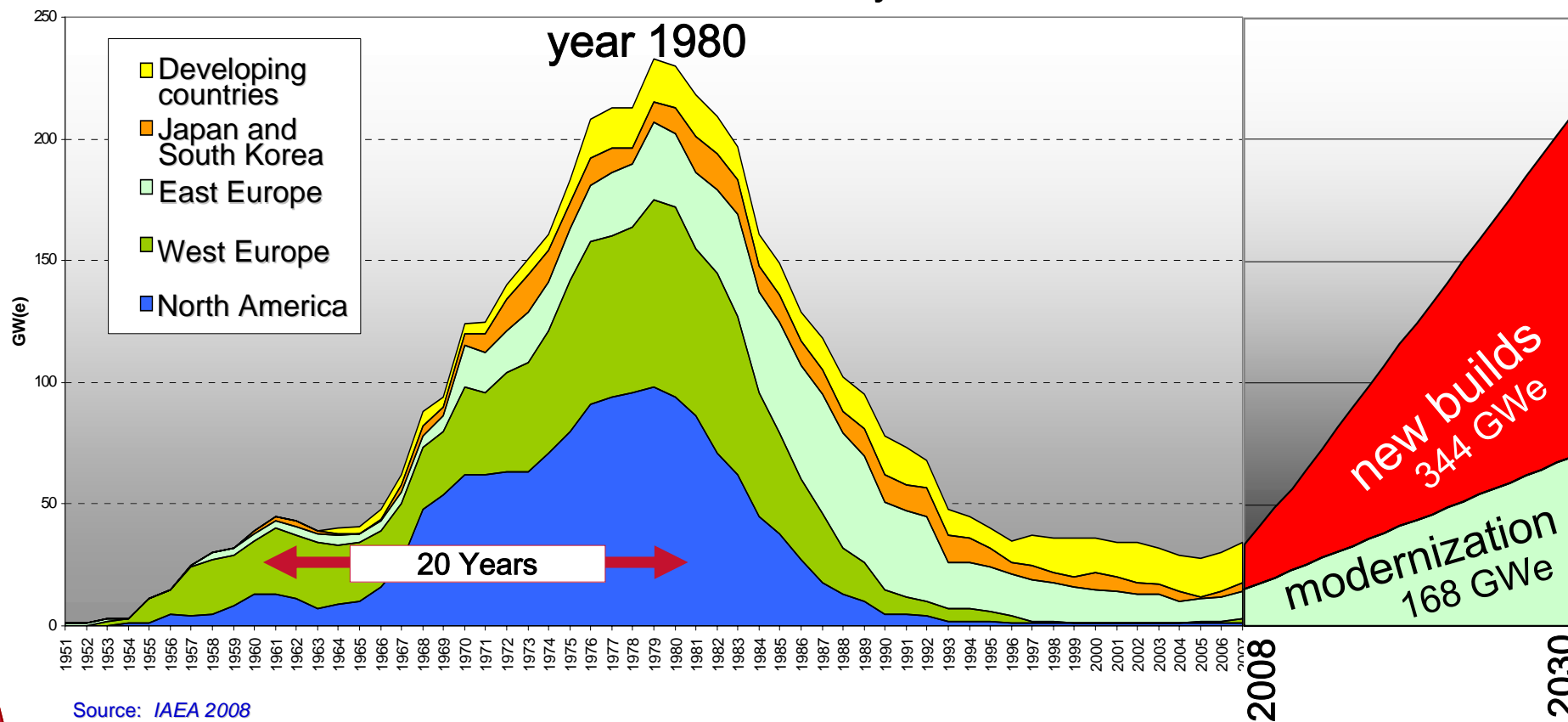


	Building first plant
	Building new plants
	Considering first plant
	Considering new plants

	Stable
	Considering / Decommissioning
	All plants decommissioned
	No commercial reactors

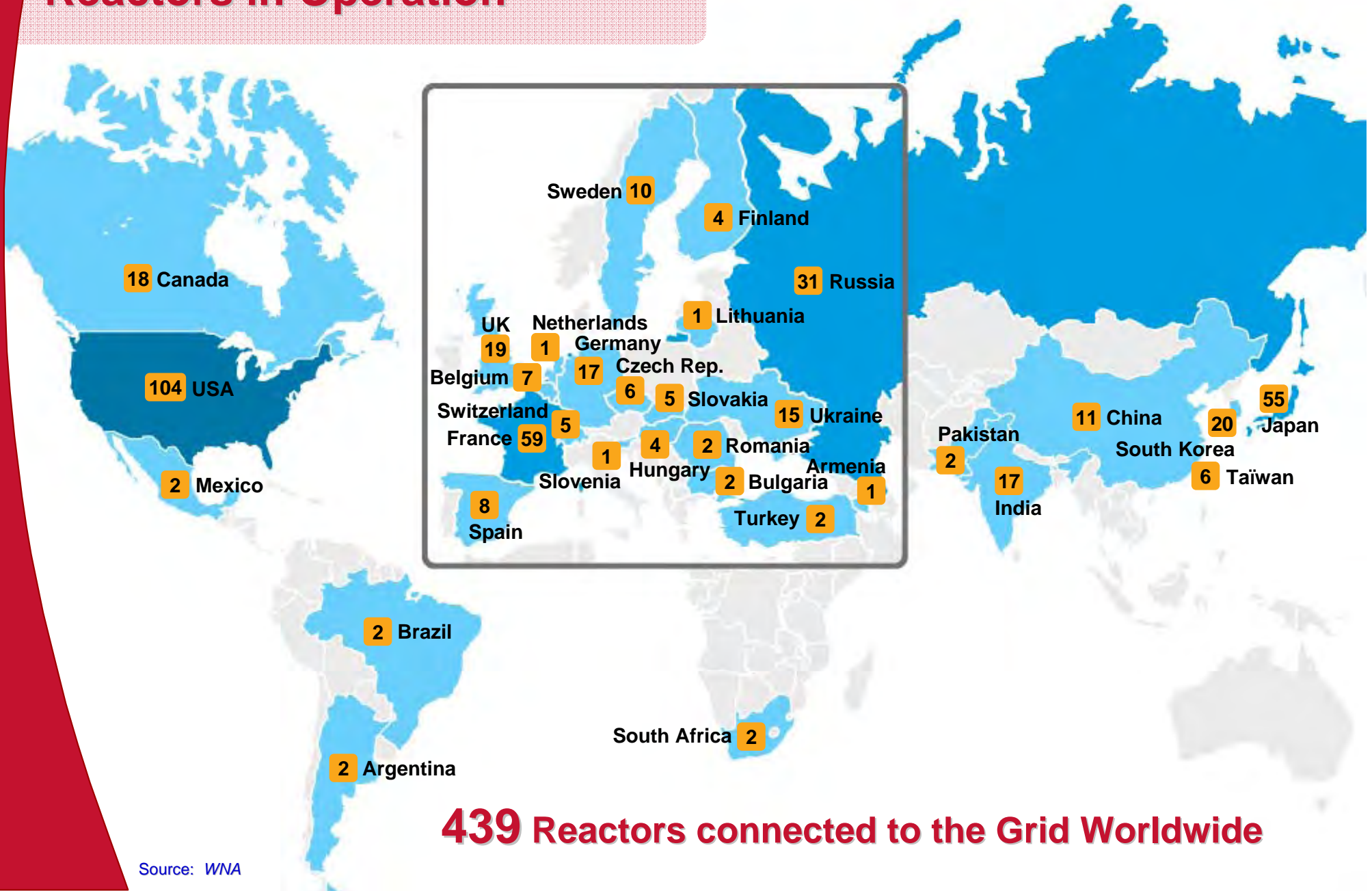
Evolution of Manufacturing Capacities

Nuclear Reactors Simultaneously under Construction



History shows: ① Capacity uprate is possible
 ② Capacity uprate takes its time

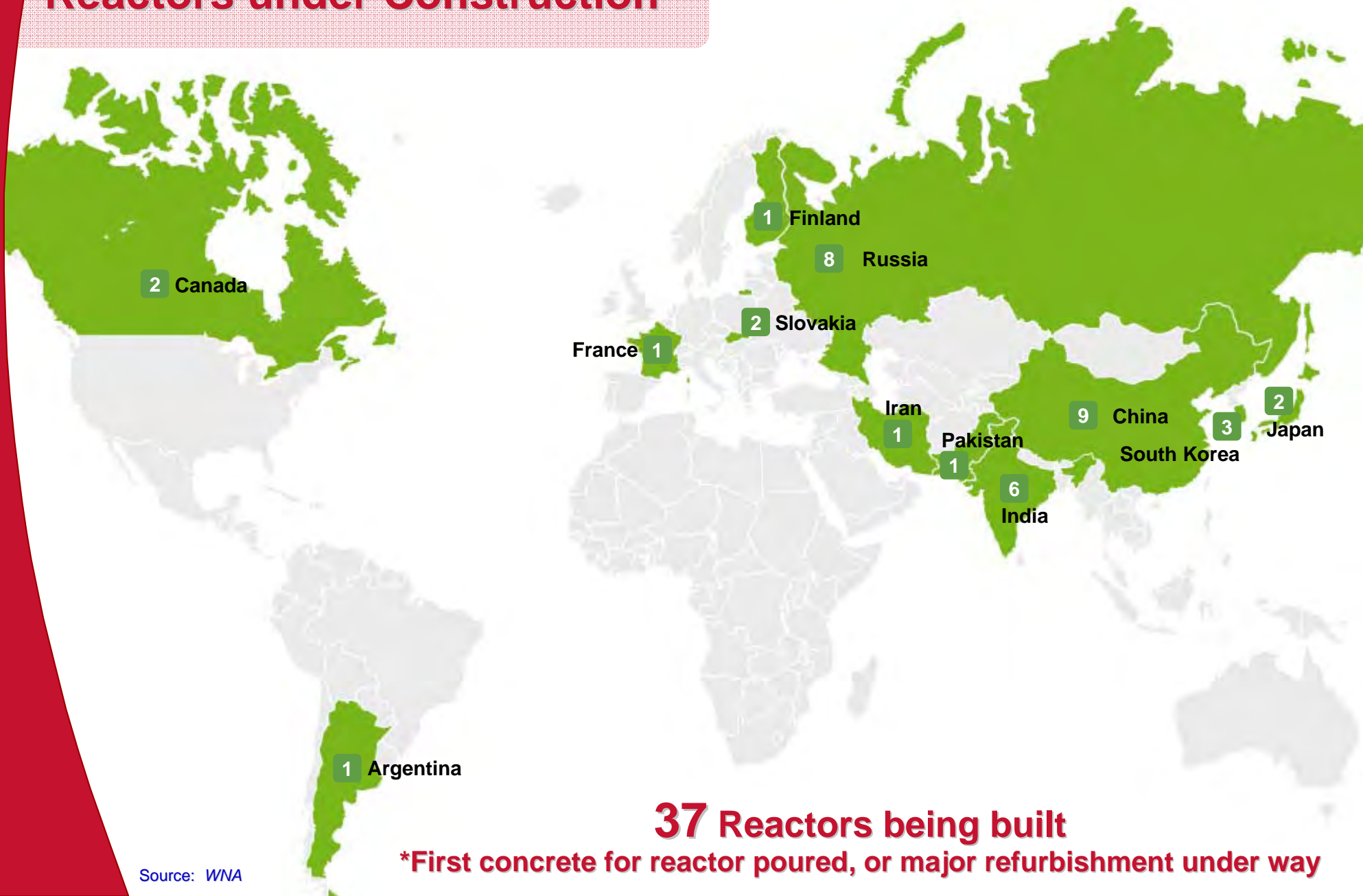
Reactors in Operation



439 Reactors connected to the Grid Worldwide

Source: WNA

Reactors under Construction*

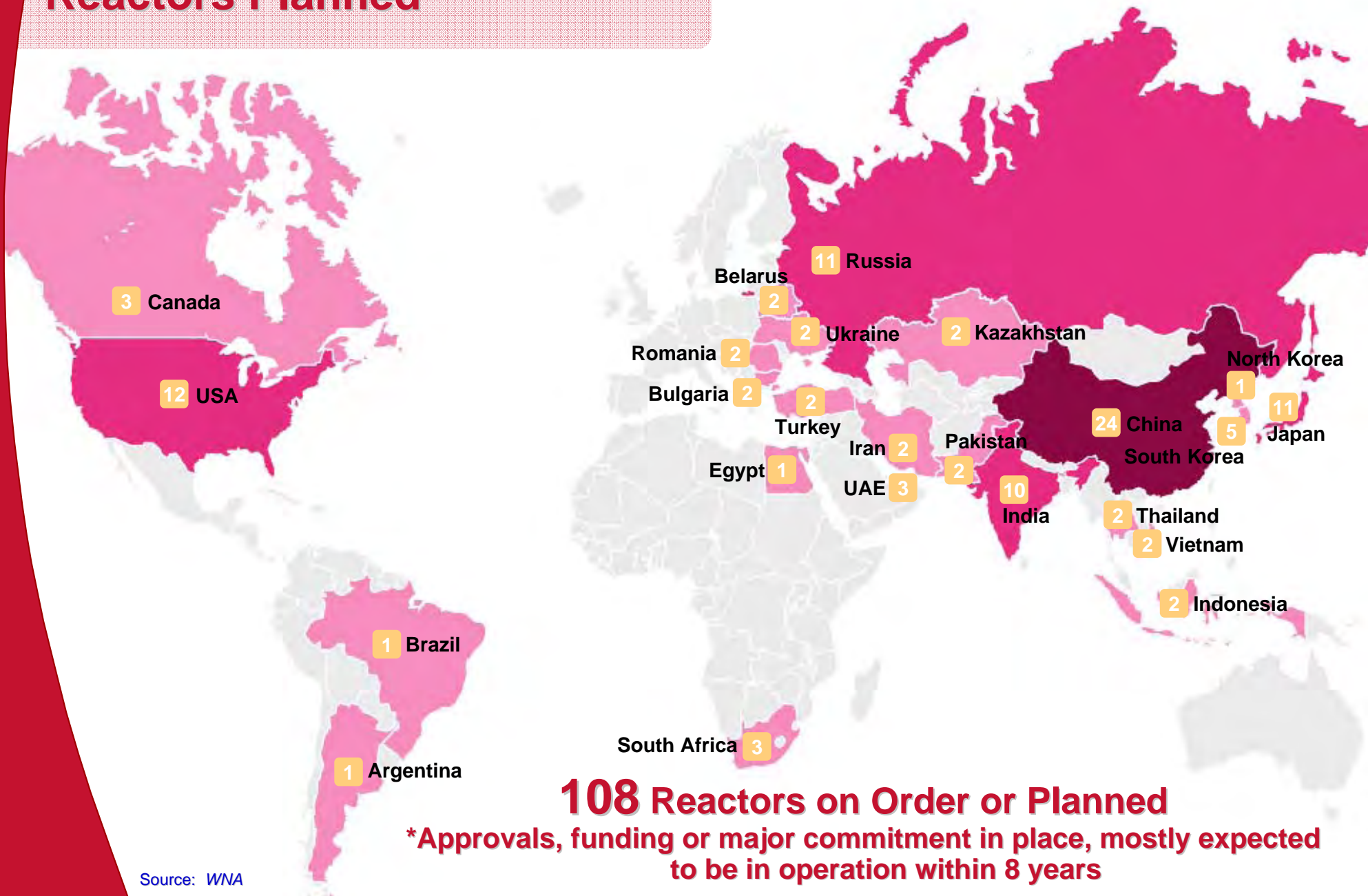


37 Reactors being built

***First concrete for reactor poured, or major refurbishment under way**

Source: WNA

Reactors Planned*

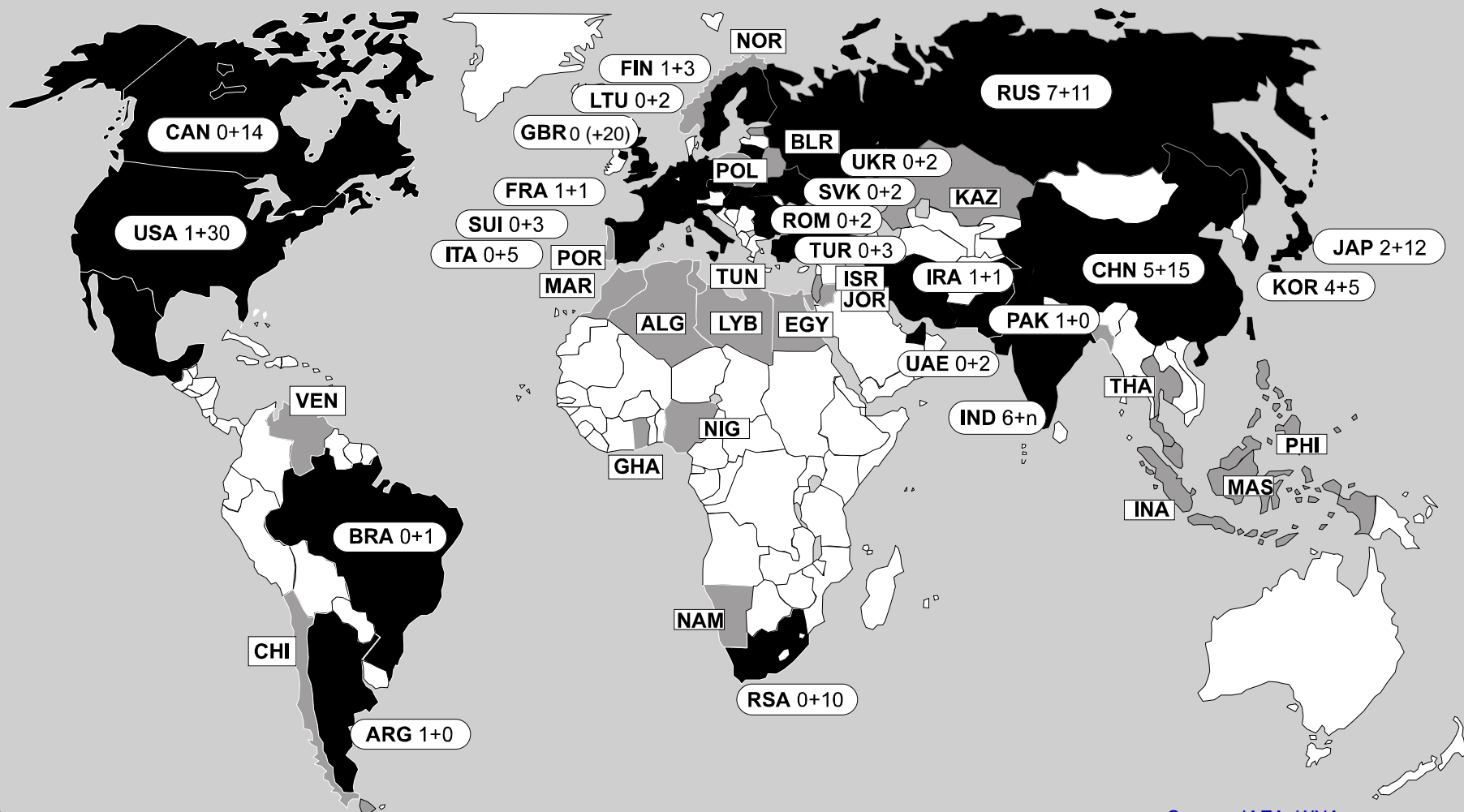


108 Reactors on Order or Planned

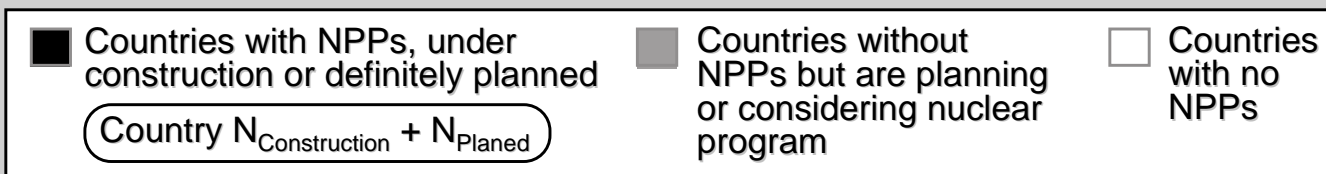
*Approvals, funding or major commitment in place, mostly expected to be in operation within 8 years

Source: WNA

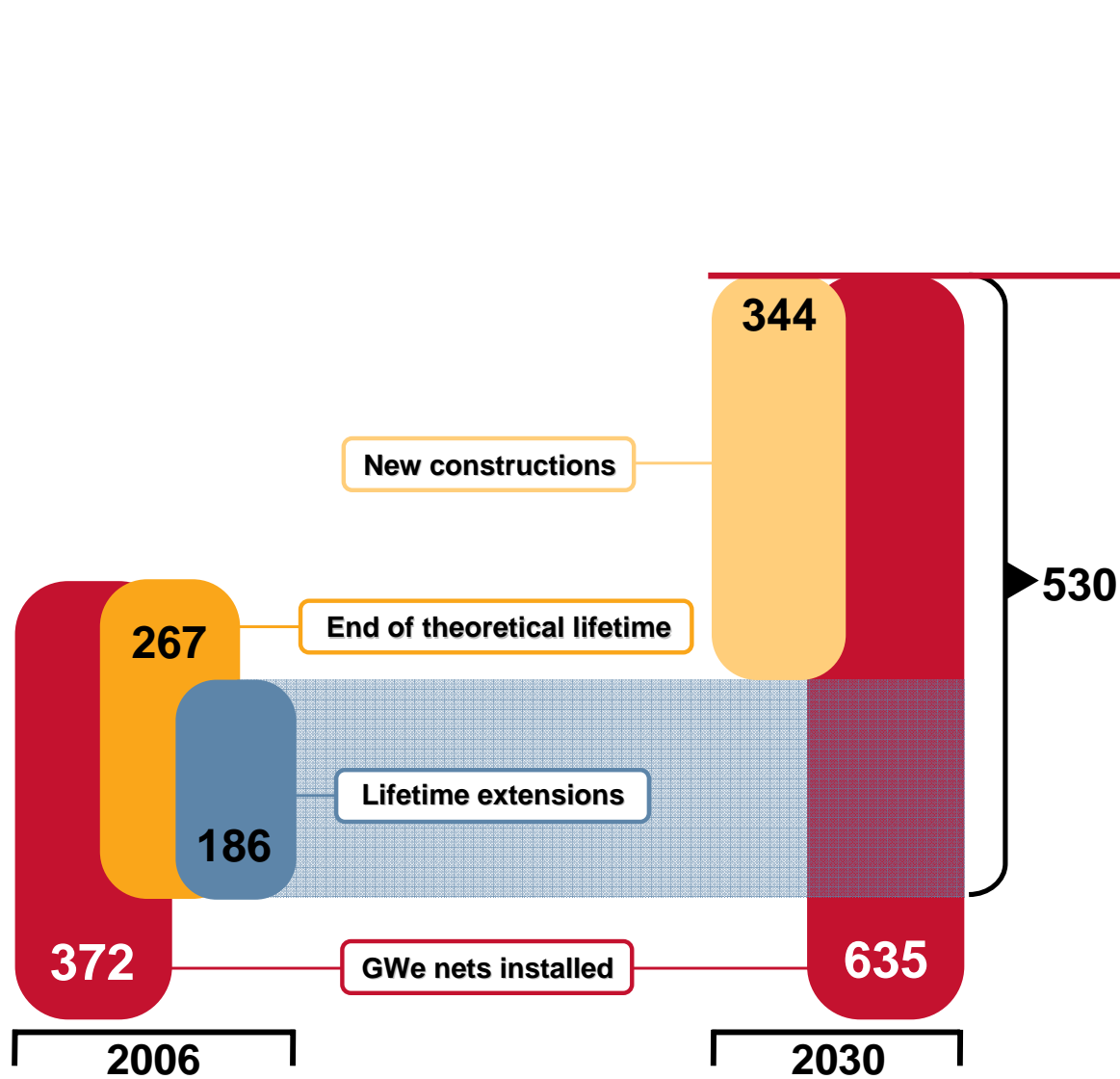
Nuclear Power Plants Worldwide (April 2009)



Source: IAEA, WNA



Worldwide Installed Nuclear Power Will Rise — Mutual International Consent

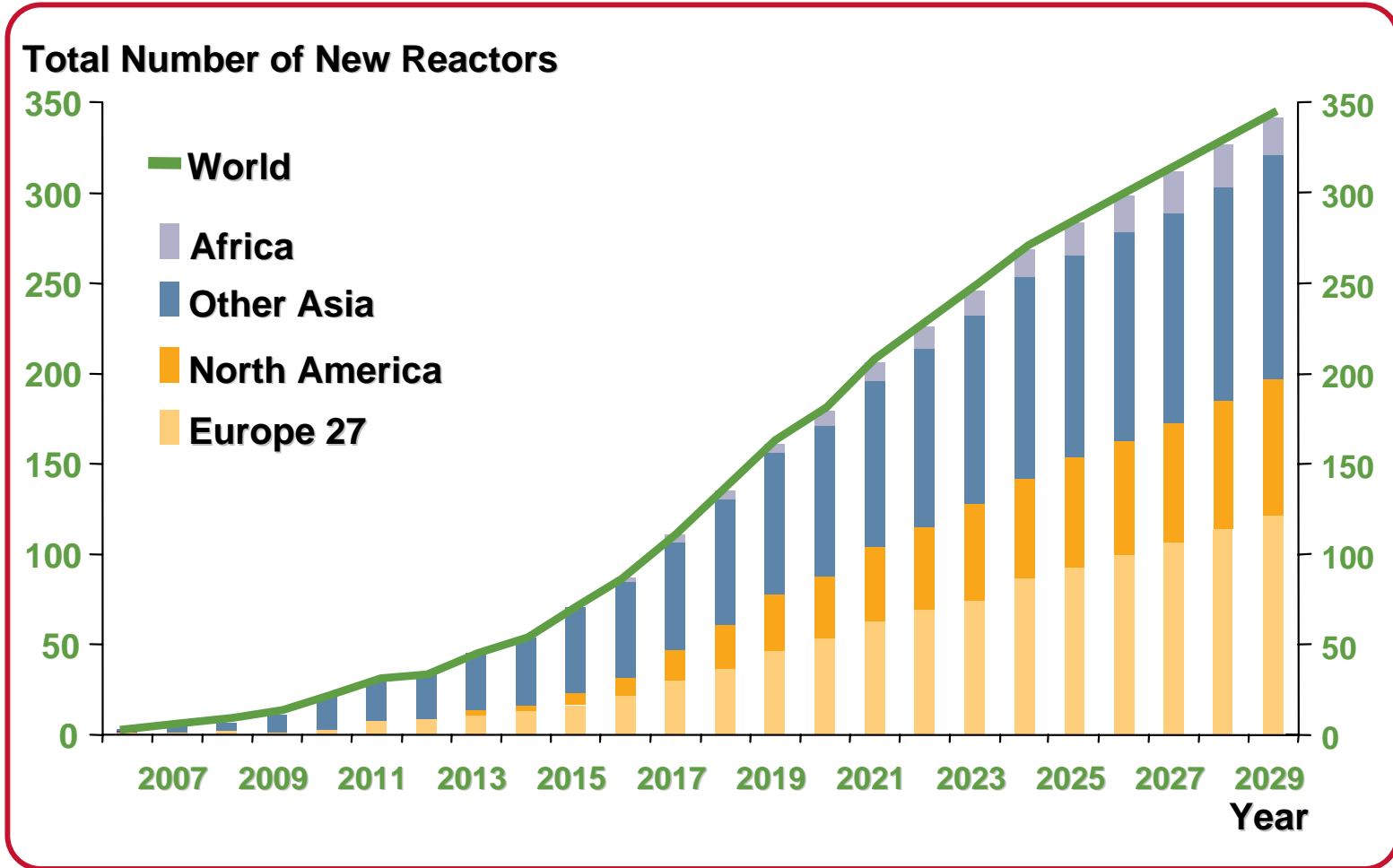


Institutions internationales

- 833 : WEO - 2007 Stabilisation 450ppm
- 731 : WNA - 2007 Upper
- 691 : IAEA - 2007 High
- AREVA**
- 529 : WNA - 2007 Reference
- 525 : WEO - 2007 Alternative
- 447 : IAEA - 2007 Low
- 438 : DOE EIA 2006
- 415 : WEO - 2007 Reference

The 2030 AREVA scenario foresees that more than 500 GWe of nuclear power will be added through new constructions or life extensions

New Nuclear Constructions Worldwide



Source: AREVA Strategic Plan 2007

Nuclear power is growing in new markets

Trends in Nuclear Power Worldwide

(October 2008)

- ❑ **China:** Duplication of reactors and construction of 6 Gen III+ (2 EPR™). Further expansion to approx. 40 GW planned by 2020
- ❑ **India:** 6 units under construction. Installed nuclear capacity to reach 20 GW in 2020
- ❑ **U.S.:** Upratings and life extensions for existing nuclear power plants. New Energy Act offers strong incentives for the construction of new plants; AREVA and Constellation Energy are starting a U.S. EPR™ marketing drive.
- ❑ **Canada:** To meet demand, new service life of 25 years for six reactors shut down in 1997: four units reconnected between 2003 and 2005 two more units to be modernized and recommissioned by 2009/10
- ❑ **Japan:** Three new nuclear power plants are under construction and 12 planned

The IAEA is anticipating a boom in the production of nuclear-based power: "Some 127 new nuclear power plants will have to be built worldwide by 2020."

Mohamed El Baradei, IAEA, March 2005



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The Energy Situation in Europe



**Our dependence is
already too high**

❑ Geopolitical constraints

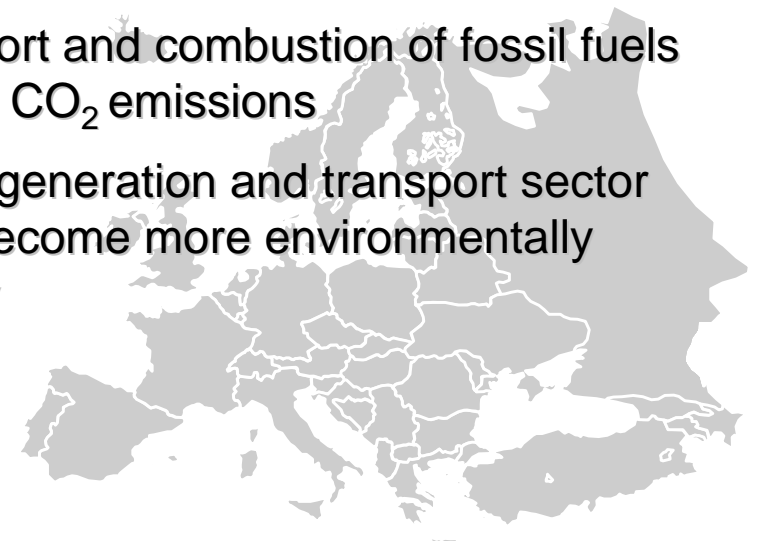
- Today Europe imports 50% of its energy
- By 2030 this figure will have risen to 70%

❑ Geological dependency

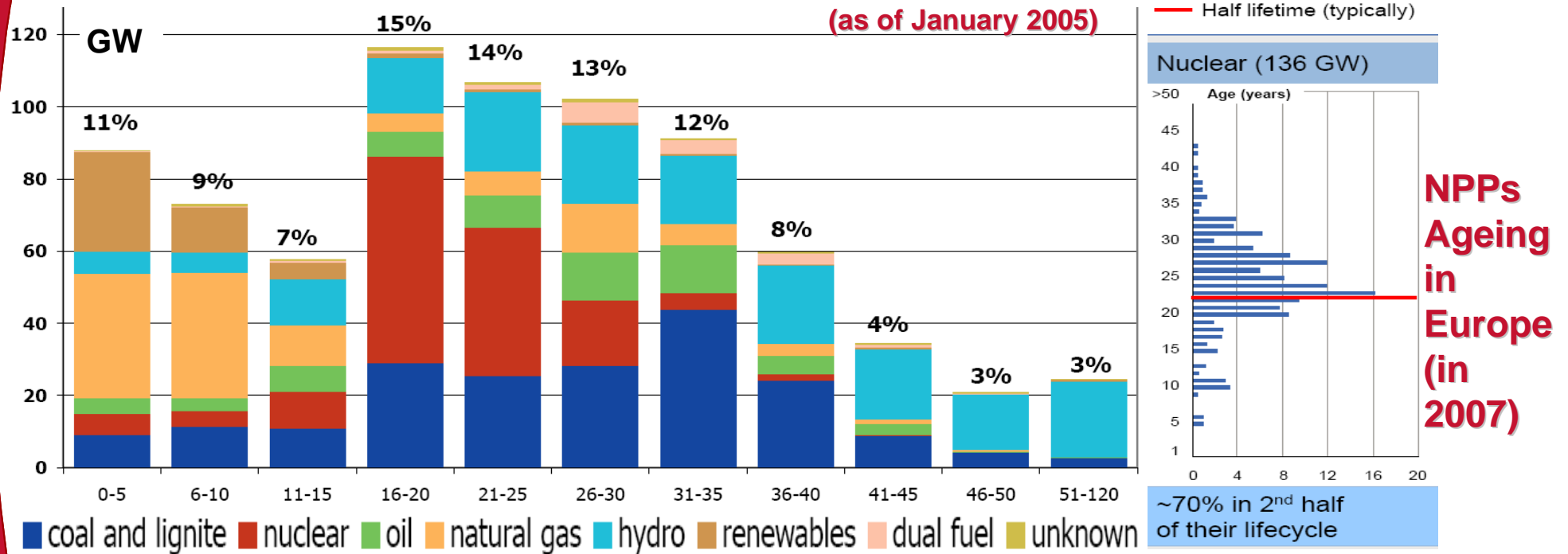
- Increase in oil and gas consumption with simultaneous depletion of resources

❑ Environmental protection will gain in importance

- Transport and combustion of fossil fuels causes CO₂ emissions
- Power generation and transport sector must become more environmentally friendly



Breakdown of European Power Generation by Age

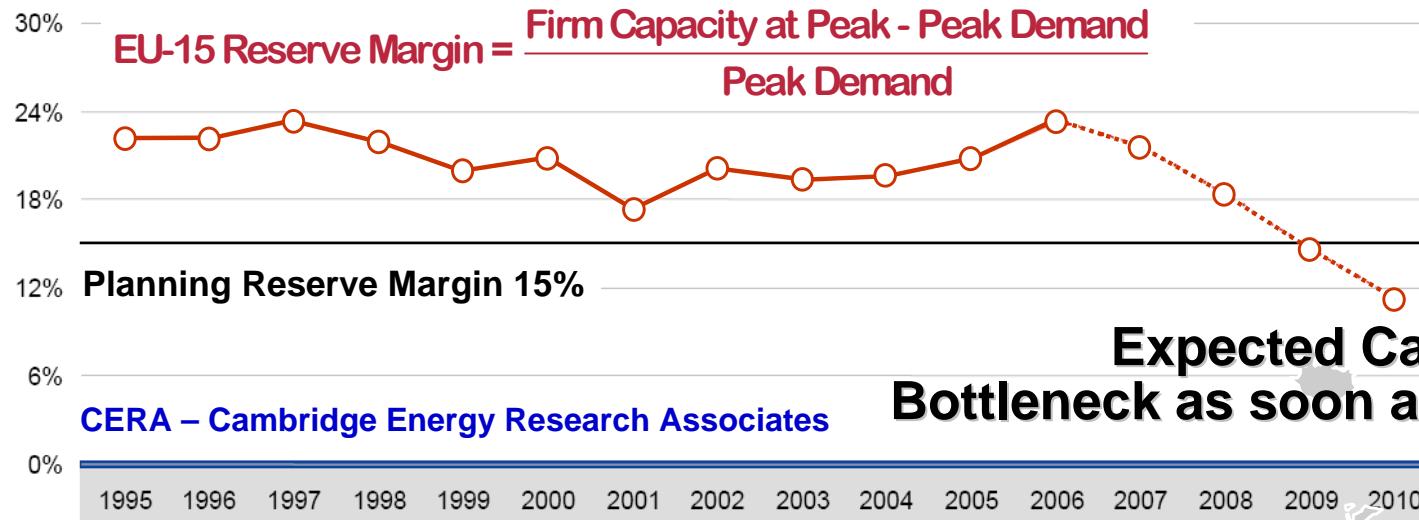


Source: RWE, Fact Book — Generation Capacity in Europe, RWE, Germany, June 2007

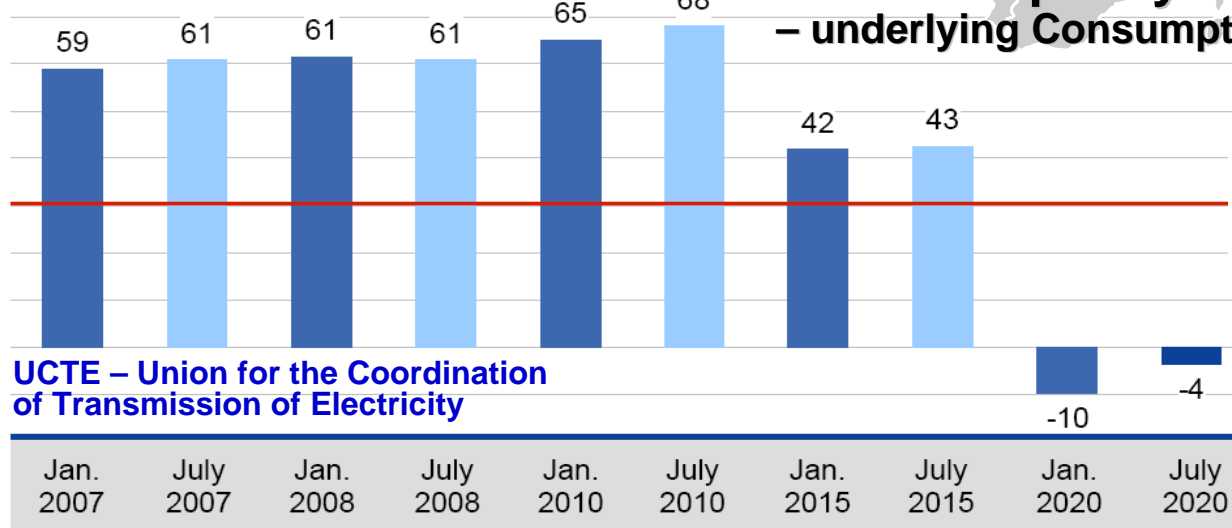
- ❑ Some 30% of generating capacity is now more than 30 years old;
- ❑ The installed capacity by plant age reflects the technological history of Europe's electricity industry;
- ❑ Renovation of more than 50% of the current electricity installations must be addressed from as early as 2010.



Predicted Capacity Shortage/Bottleneck in Europe

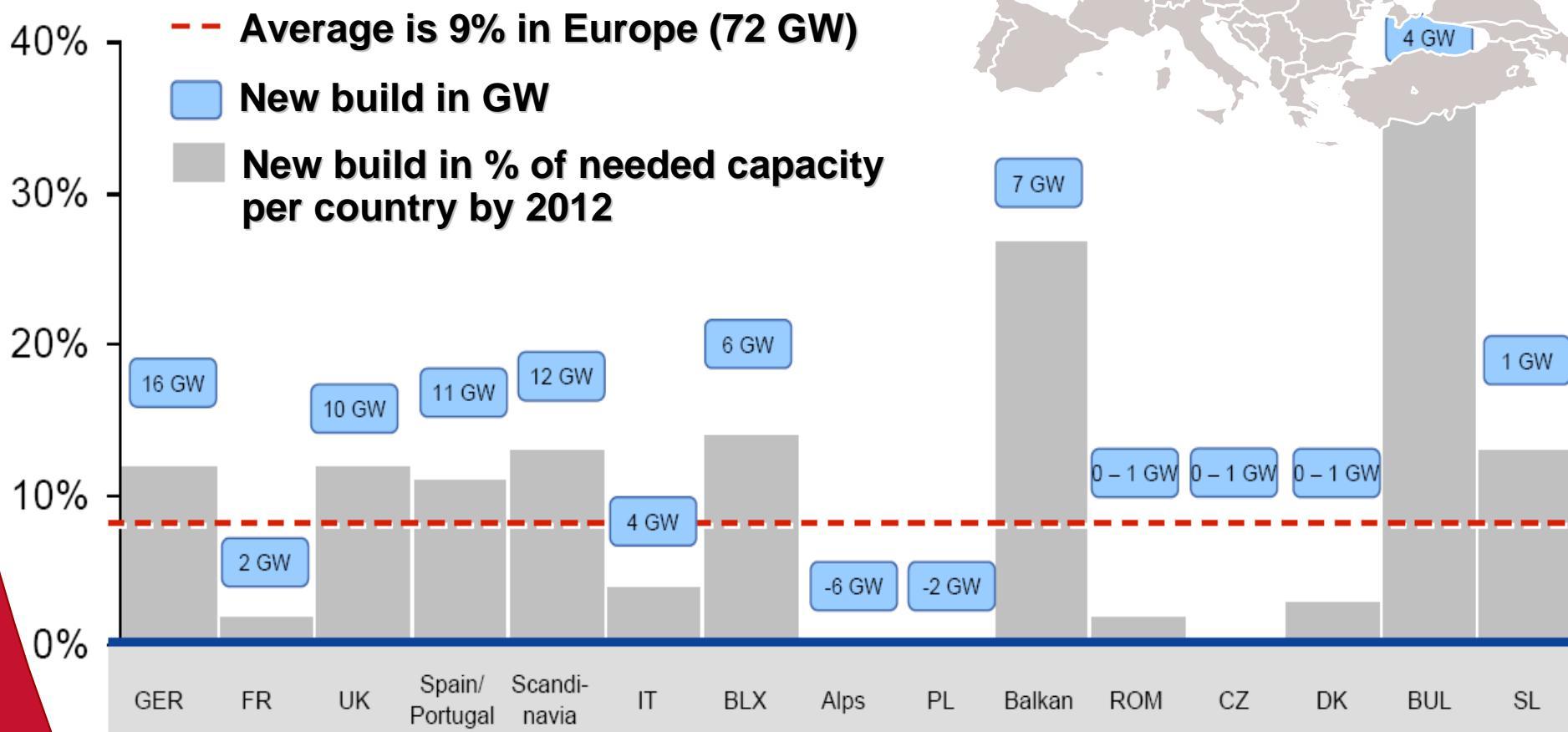


EU-25 Reserve Capacity (GW)



Source: RWE, Fact Book — Generation Capacity in Europe, RWE, Germany, June 2007

Expected New Builds for Thermal and Nuclear Power Plants in Europe by 2012



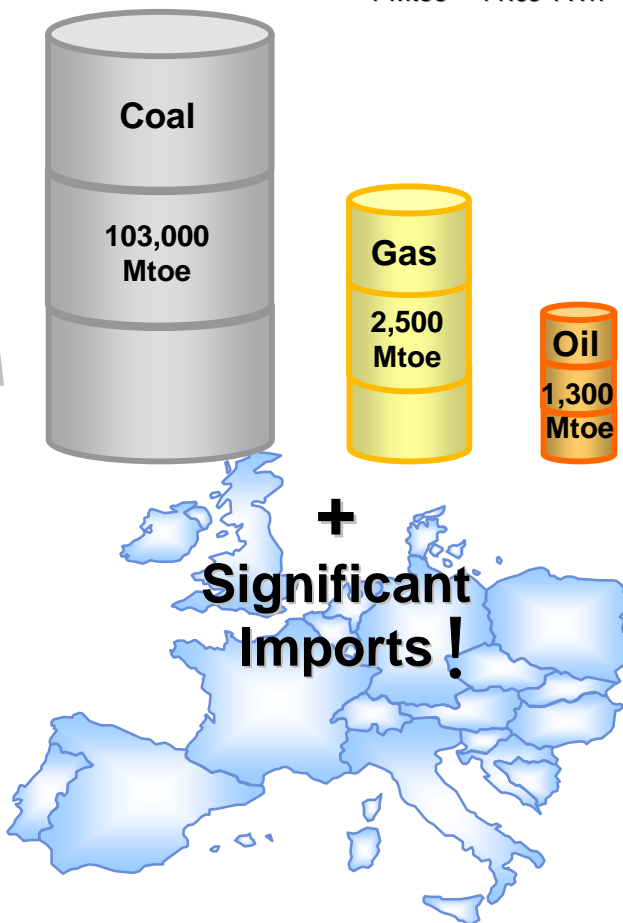
Source: RWE, Fact Book — Generation Capacity in Europe, RWE, Germany, June 2007

In 2020 an Additional Power Demand of approx. 680 TWh_{el} will have to be met in the EU-25

Coal demand for		
Power gen.	192	Mtoe
+680 TWh _{el} power generation		
Additional coal imports	160	Mtoe
Extra costs	12	billion €/a
Amount of CO ₂	650	million t/a

Fossil Fuel Reserves

1 Mtoe = 11.63 TWh



Gas demand for		
Power gen.	145	Mtoe
+680 TWh _{el} power generation		
Additional gas imports	131	Mtoe
Extra costs	22	billion €/a
Amount of CO ₂	290	million t/a

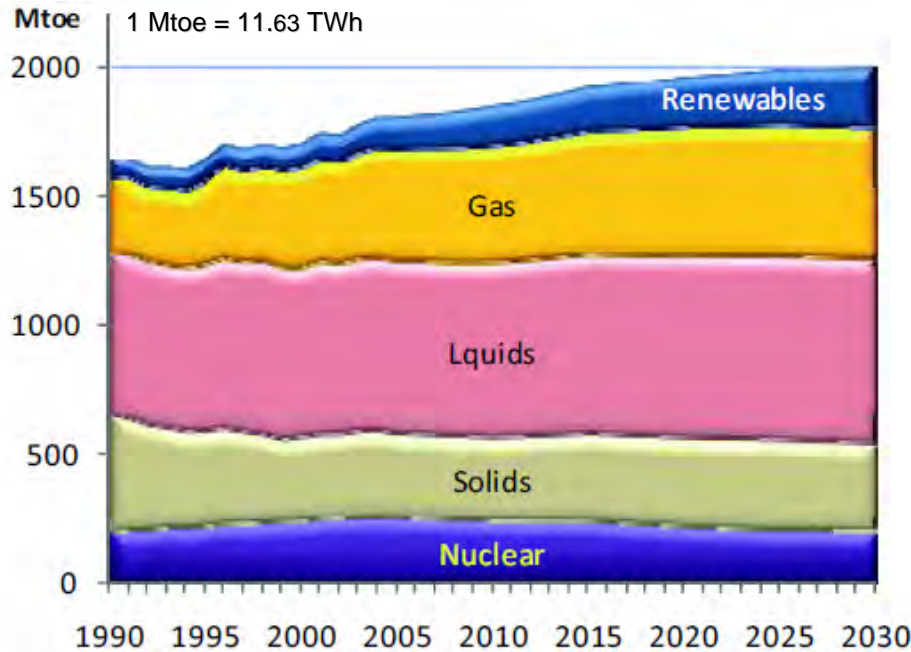
Oil demand for		
Power gen.	37	Mtoe
+680 TWh _{el} power generation		
Additional oil imports	159	Mtoe
Extra costs	45	billion €/a
Amount of CO ₂	560	million t/a

Nuclear fuel demand for		
Power gen.	242	Mtoe
+680 TWh _{el} power generation		
Additional fuel imports	177	Mtoe
Extra costs	5.2	billion €/a
Amount of CO ₂	0	million t/a

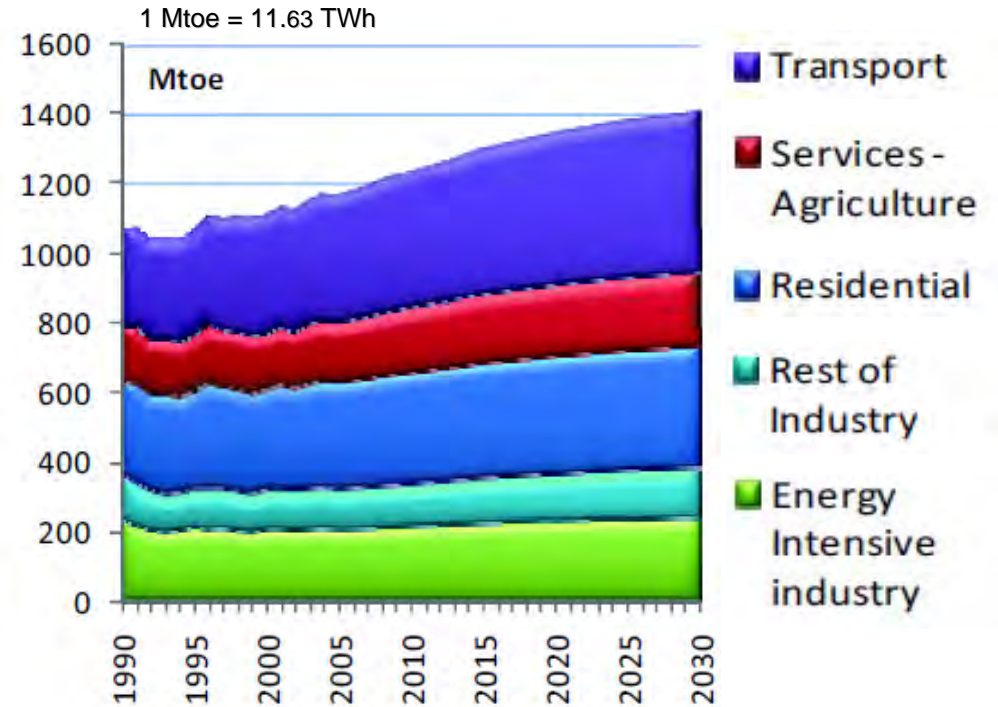
Source: Extrapolation of EU-25 data from "Statistics and prospects for the European electricity sector", 2004

A single energy source alone will not be able to meet the additional fuel demand expediently

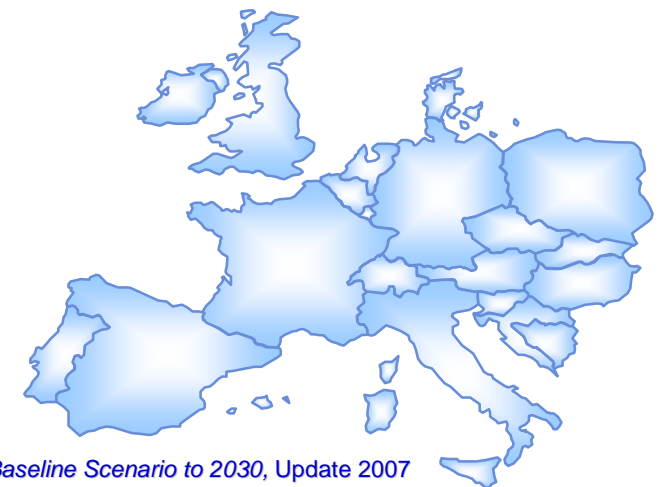
EU-27 Energy Baseline Scenario to 2030 — 1/2



Primary Energy Requirements by Fuel

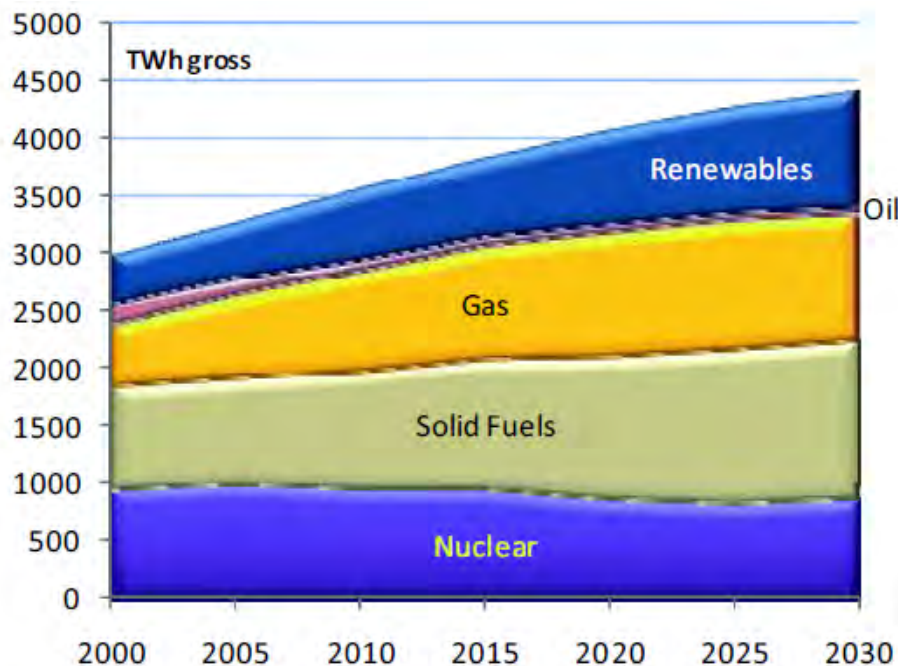


Final Energy Demand by Sector

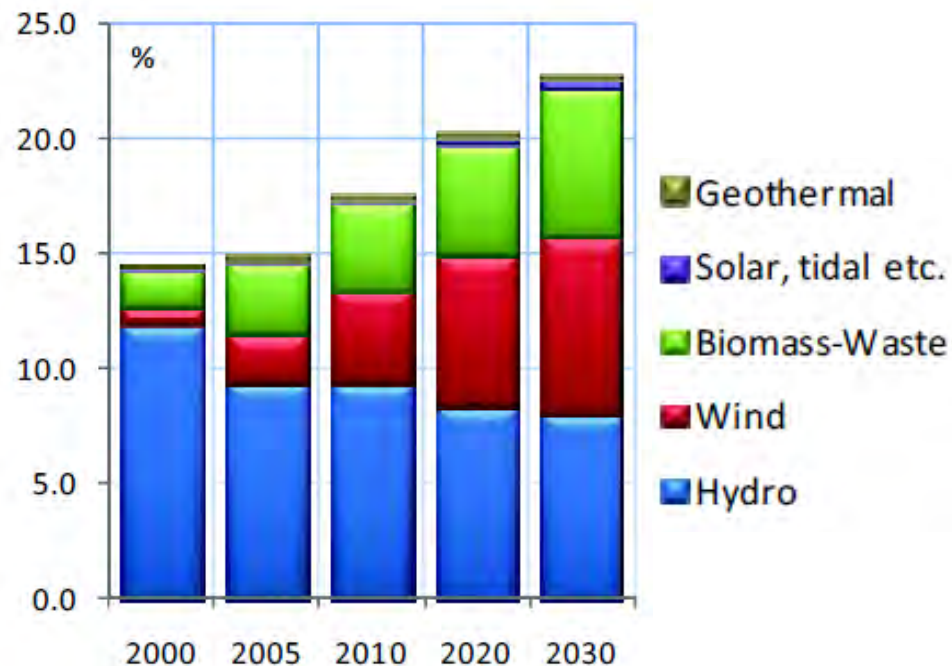


Source: EU-27 Energy Baseline Scenario to 2030, Update 2007

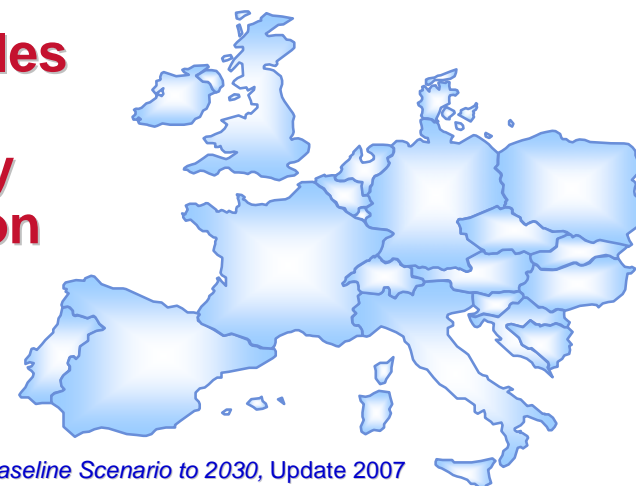
EU-27 Energy Baseline Scenario to 2030 — 2/2



Gross Electricity Generation by Source

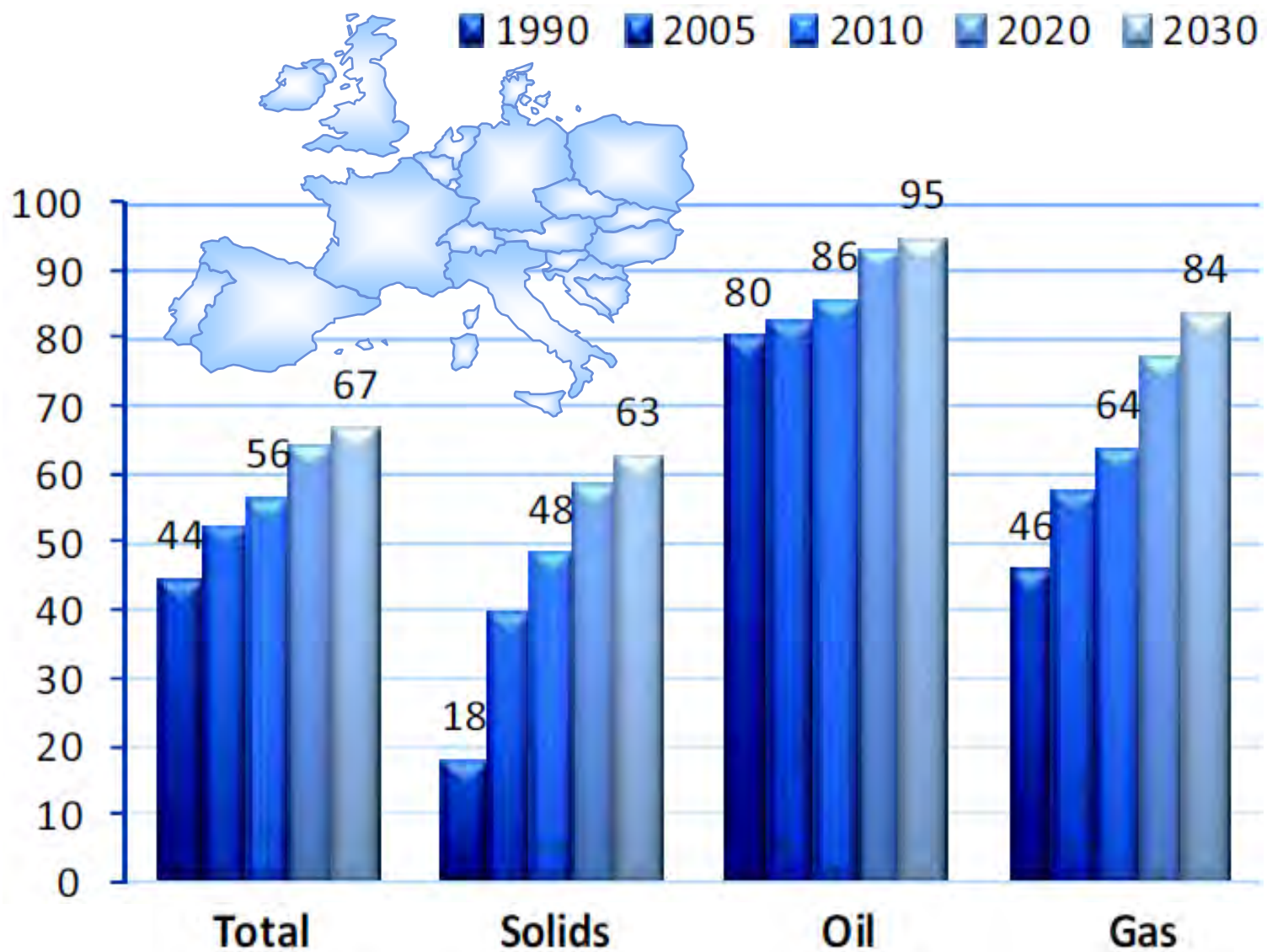


Renewables Share in Electricity Generation (Gross)



Source: EU-27 Energy Baseline Scenario to 2030, Update 2007

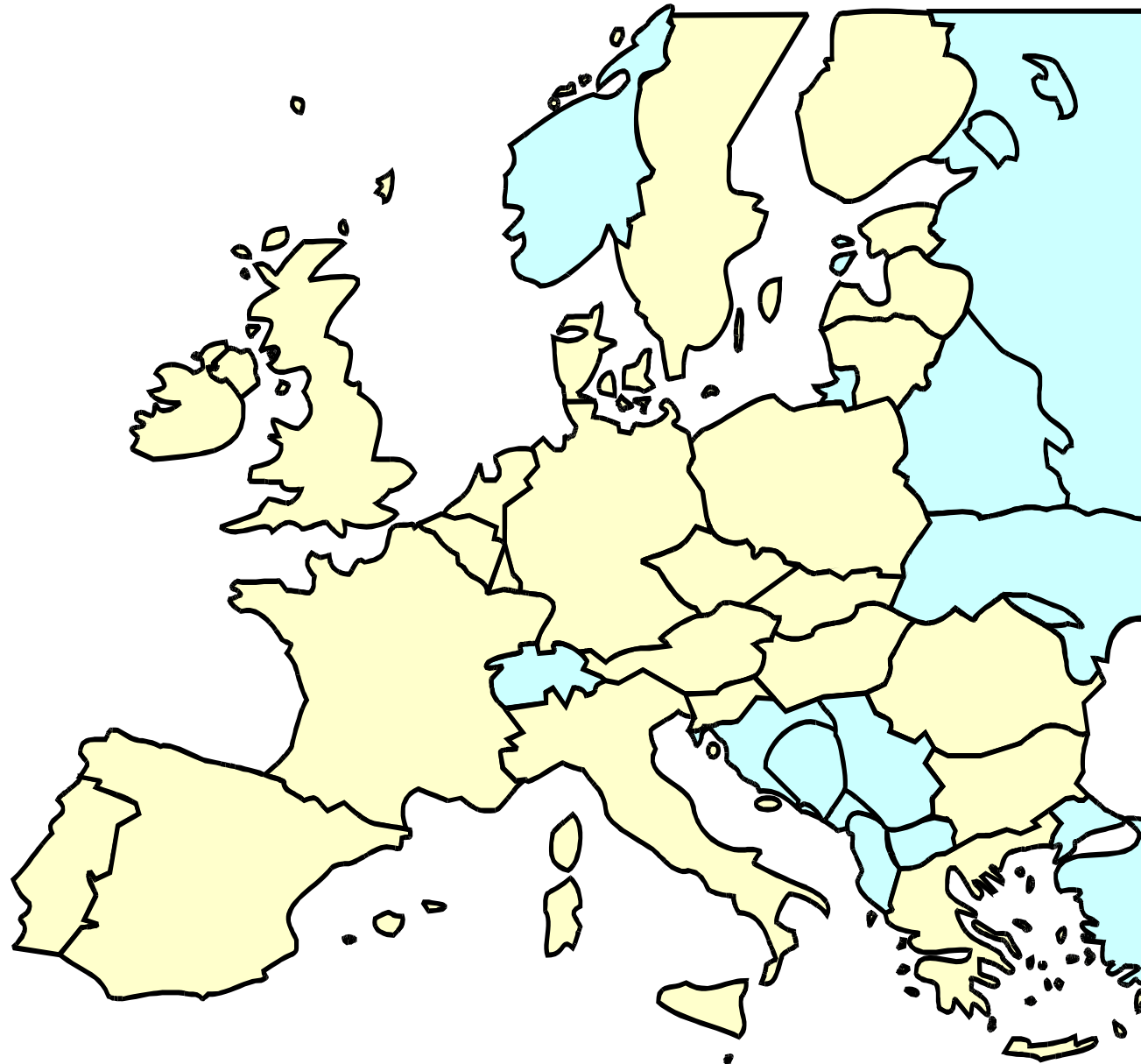
Import Dependence of the EU-27



Source: EU-27 Energy Baseline Scenario to 2030, Update 2007



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Source: Stritar A., Int. Conf. NENE-2008, Portoroz, Slovenia, September 2008

16 Nuclear EU Countries

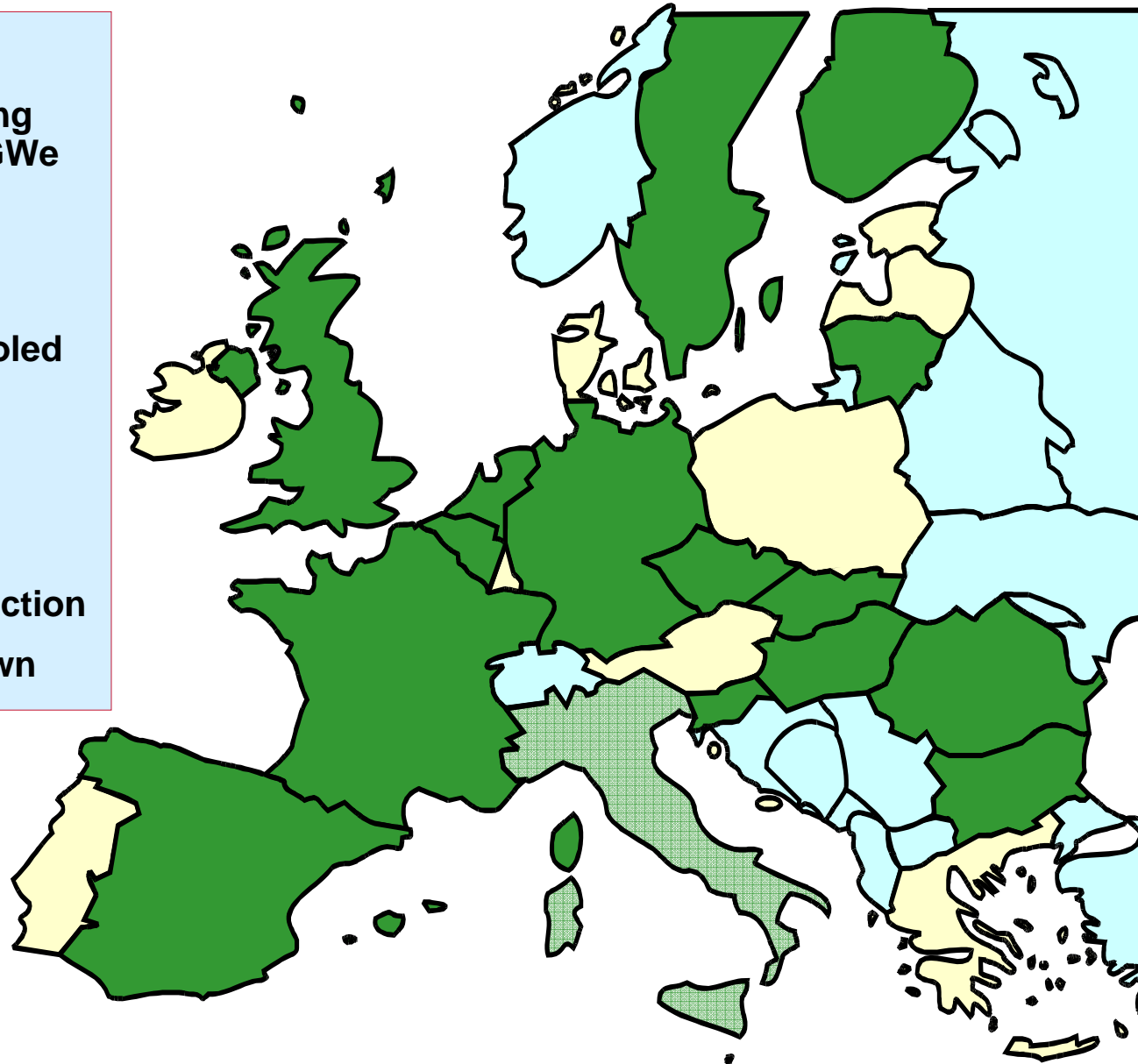
Reactors

150 Operating
132.36 GWe

89 PWR
17 VVER
16 BWR
21 Gas Cooled
2 PHWR
1 FBR
1 RBMK

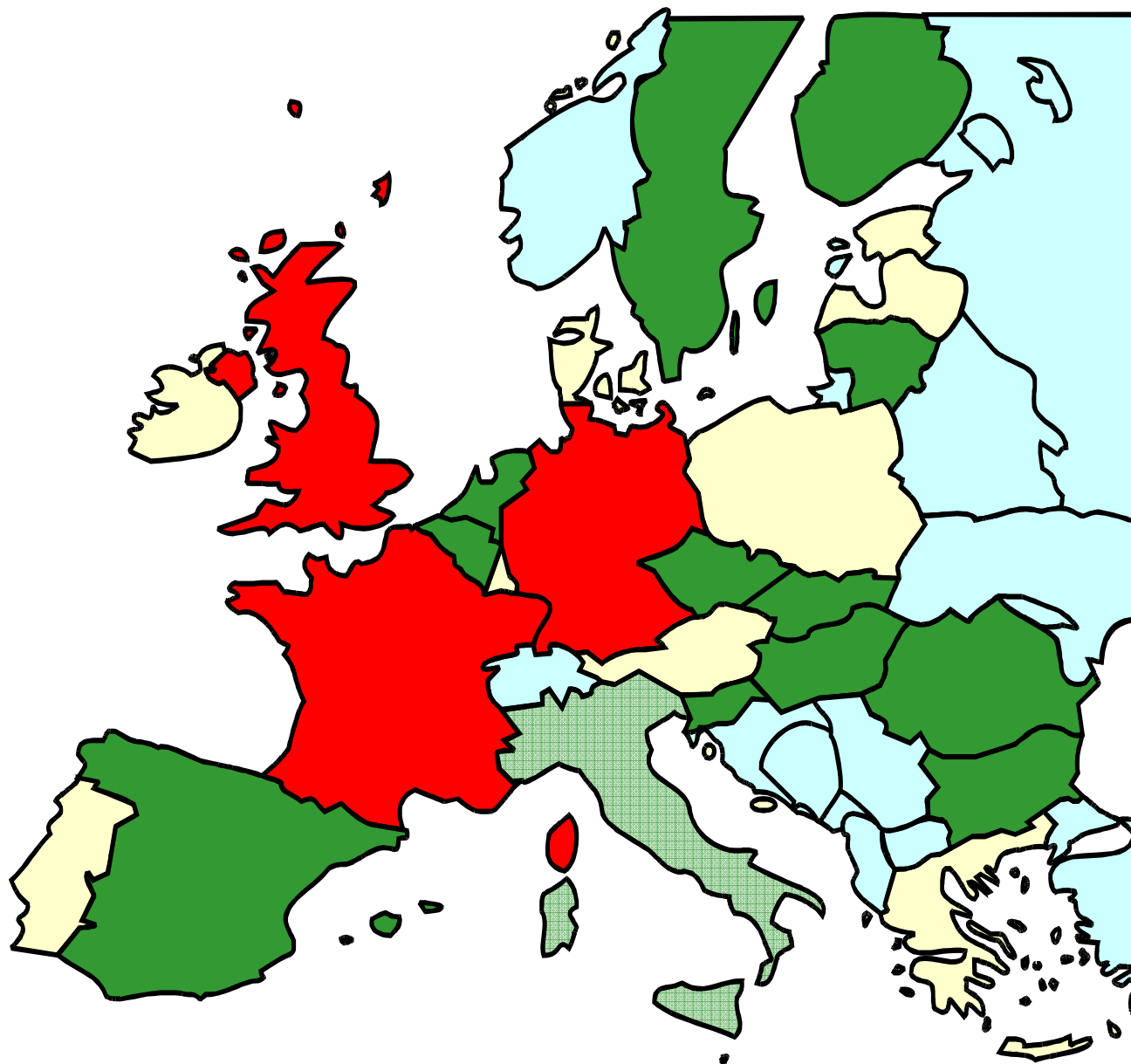
6 Under Construction

74 Shutdown



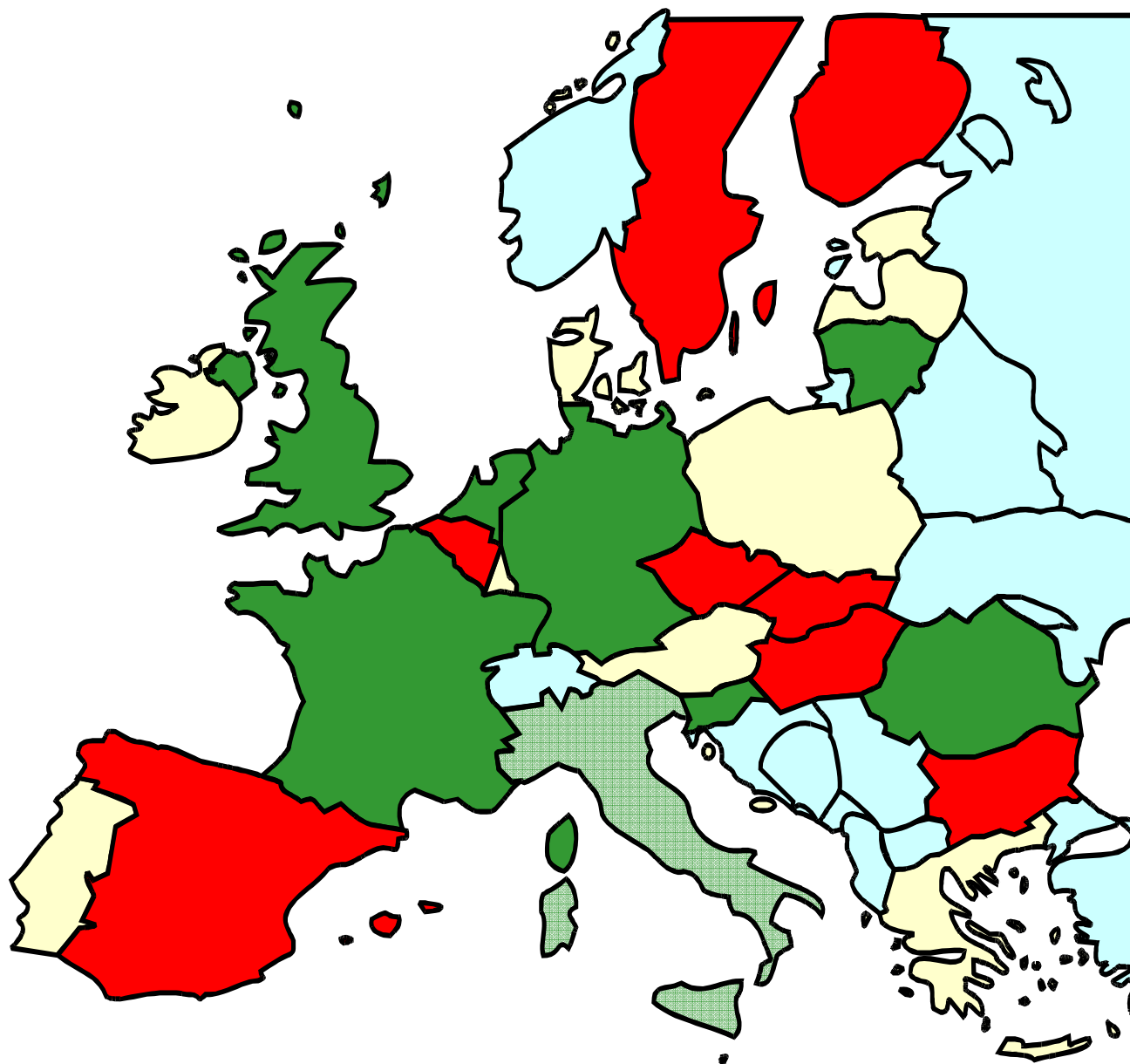
Source: Stritar A., Int. Conf. NENE-2008, Portoroz, Slovenia, September 2008

3 'BIG' Nuclear EU Countries



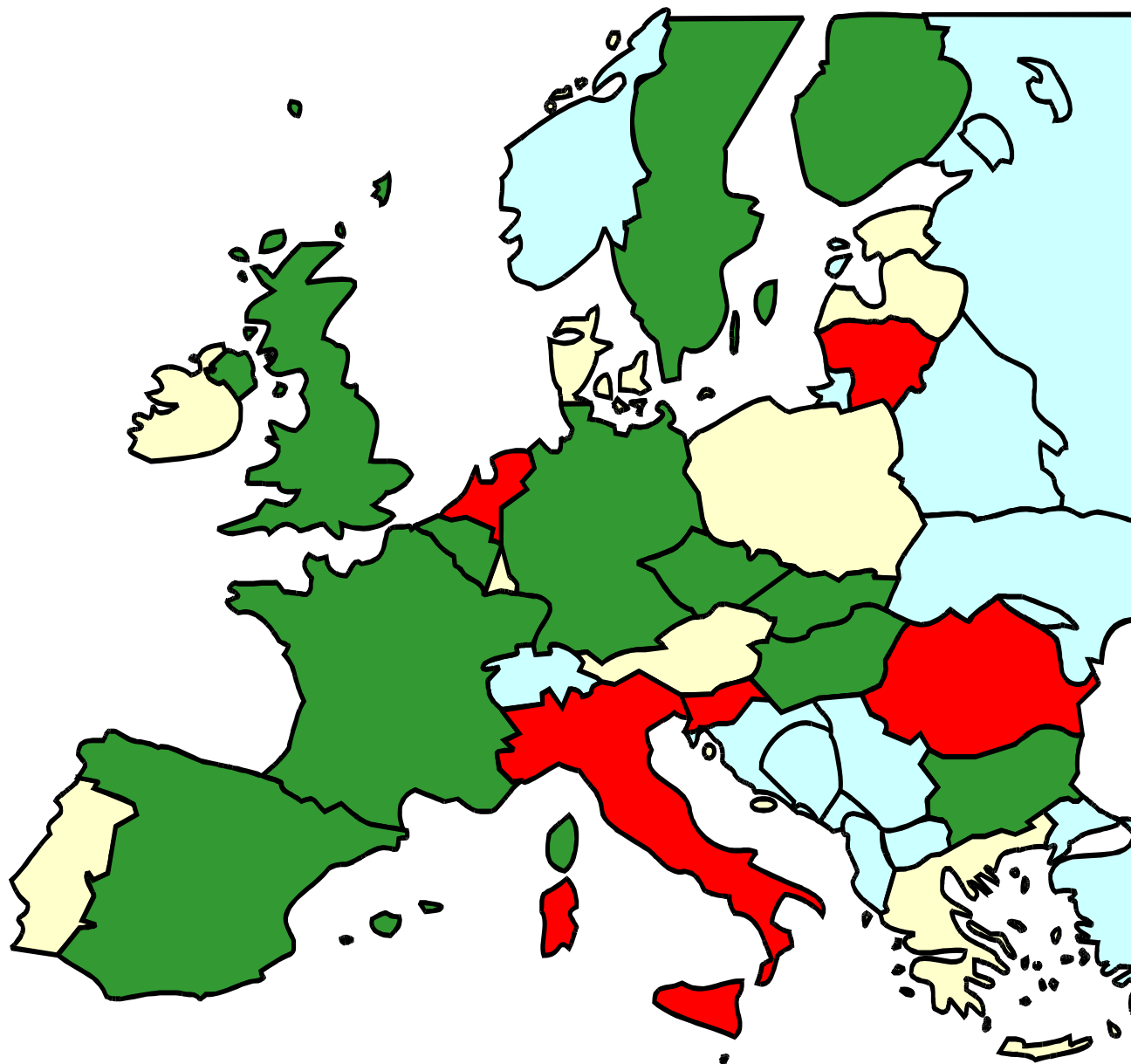
Source: Stritar A., Int. Conf. NENE-2008, Portoroz, Slovenia, September 2008

8 'MEDIUM' Nuclear EU Countries



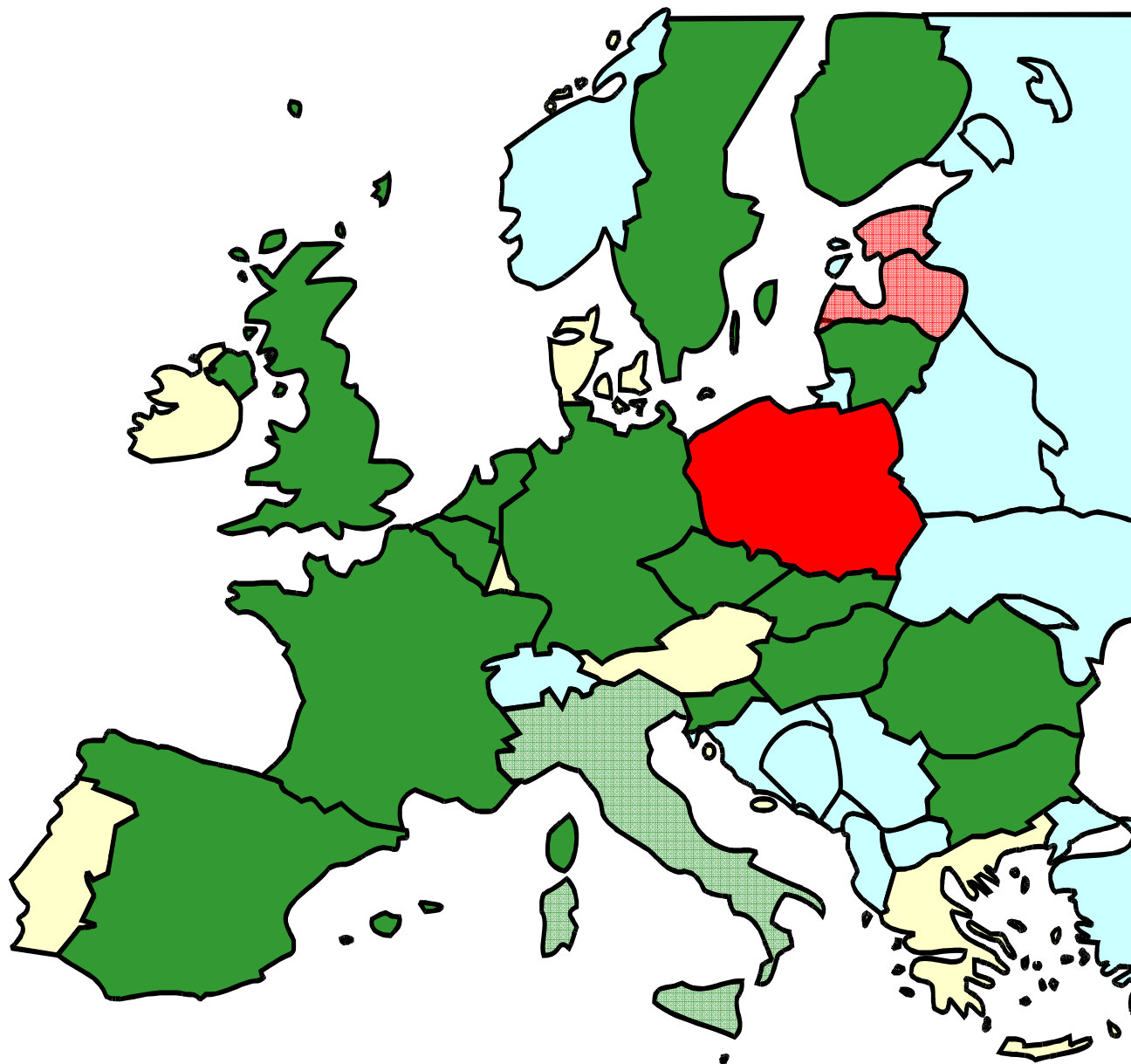
Source: Stritar A., Int. Conf. NENE-2008, Portoroz, Slovenia, September 2008

5 'SMALL OR FORMER' Nuclear EU Countries



Source: Stritar A., Int. Conf. NENE-2008, Portoroz, Slovenia, September 2008

1–3 (4) 'TO BE (AGAIN)' Nuclear EU Countries



Source: Stritar A., Int. Conf. NENE-2008, Portoroz, Slovenia, September 2008

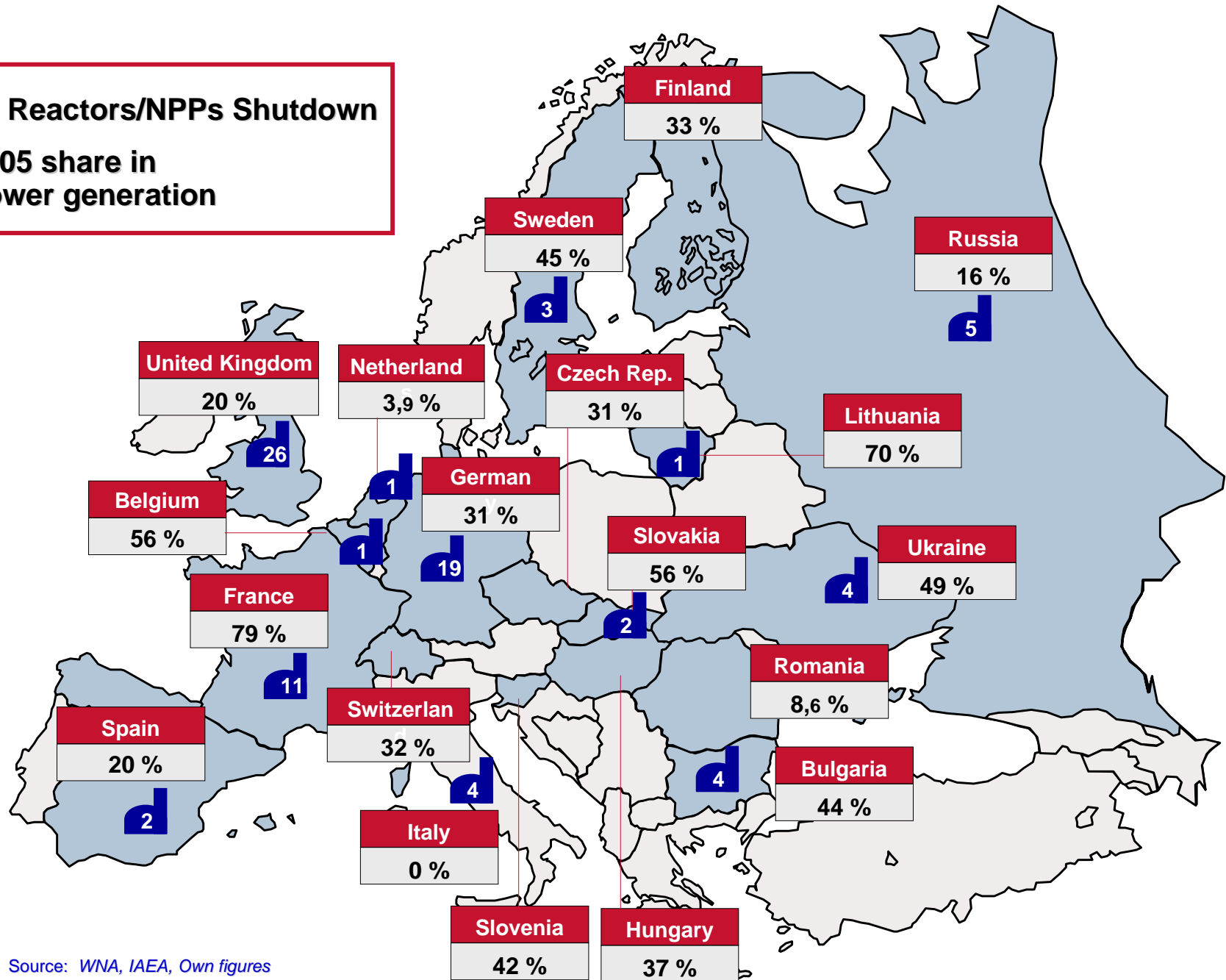


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Nuclear Power in Europe (January 2007)

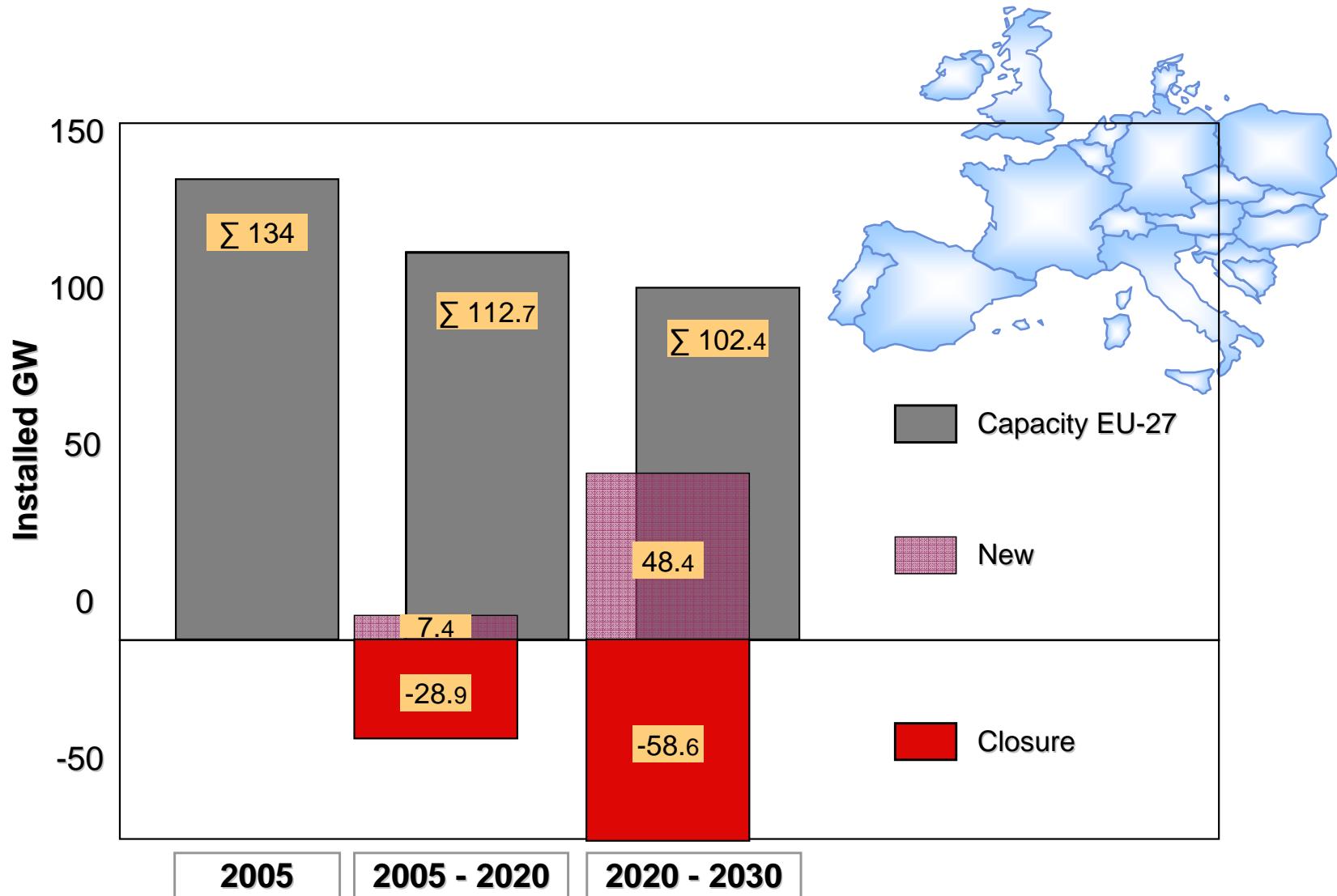
83 Reactors/NPPs Shutdown

2005 share in power generation



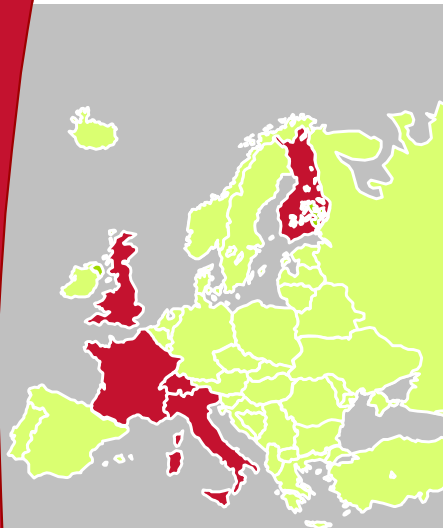
Source: WNA, IAEA, Own figures

EU-27 Nuclear Energy Baseline Scenario to 2030



Source: EU-27 Energy Baseline Scenario to 2030, Update 2007

Current Political Environment of Nuclear Energy in Europe — 1/3



France:

EDF will build EPR™ as a "series precursor" in Flamanville; construction of a second EPR™ decided and of a third EPR™ under consideration

Finland:

Application for „Decision in principle“ for 3 other projects was applied for (TVO, Fortum, Fennovoima)

United Kingdom:

Joint Venture of E.ON and RWE founded for the joint construction of 2–4 NPPs;
EDF: Construction of 4 EPR™ announced priority goal: Securing of possible sites

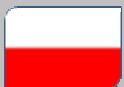
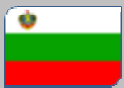
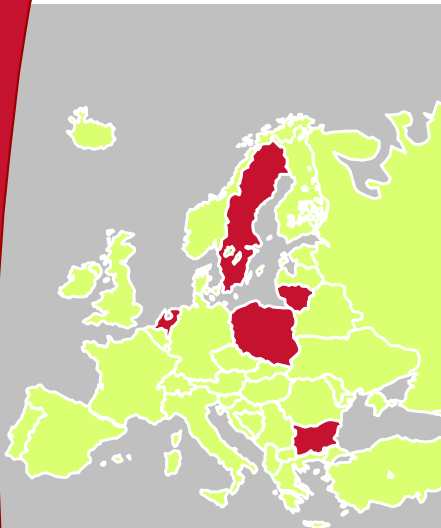
Switzerland:

Planning for three new units as replacement for today's nuclear power plants at the end of their service life;
The licensing procedure has already started

Italy:

Access to generation capacity of the French EPR™;
EDF and ENEL are investigating the possibility of building four EPR™ in Italy

Current Political Environment of Nuclear Energy in Europe — 2/3



Bulgaria:

Construction of two 1,000–MW units at the Belene site ordered in December 2006, signing of contract in January 2008

Lithuania:

Construction of 2 nuclear power plants (a total of 3,000 MW) design is planned to compensate for shutdown of Ignalina (RBMK, 2x1,300 MW)

Netherlands:

20–Year lifetime extension for Borssele until 2033, construction of 1 or 2 new nuclear power plants at Borssele is under consideration; Essent acquisition by RWE

Poland:

New construction is considered, eventually together with Lithuania

Sweden:

Utilities are backfitting nuclear power plants and want a life extension of up to 60 years;
Lifting the ban on the construction of new nuclear power plants

Current Political Environment of Nuclear Energy in Europe — 3/3



Slovakia:

Completion of Mochovce 3 and 4 and new construction planned (Bohunice 5)

Slovenia:

New construction at Krsko site planned for operating in 2019

Turkey:

Bidding for a project taking place,
Discussions on VVER reactors in progress

Czech Republic:

Planning of two new plants at Temelin site
and one new plant at Dukovany as long-term surrogate for the two VVER440 blocks in Dukovany

Hungary:

On the 30.3.2009 Parliament voted with 330:6 votes for a landmark decision of building a new reactor at NPP Paks;
Commissioning not earlier than 2020

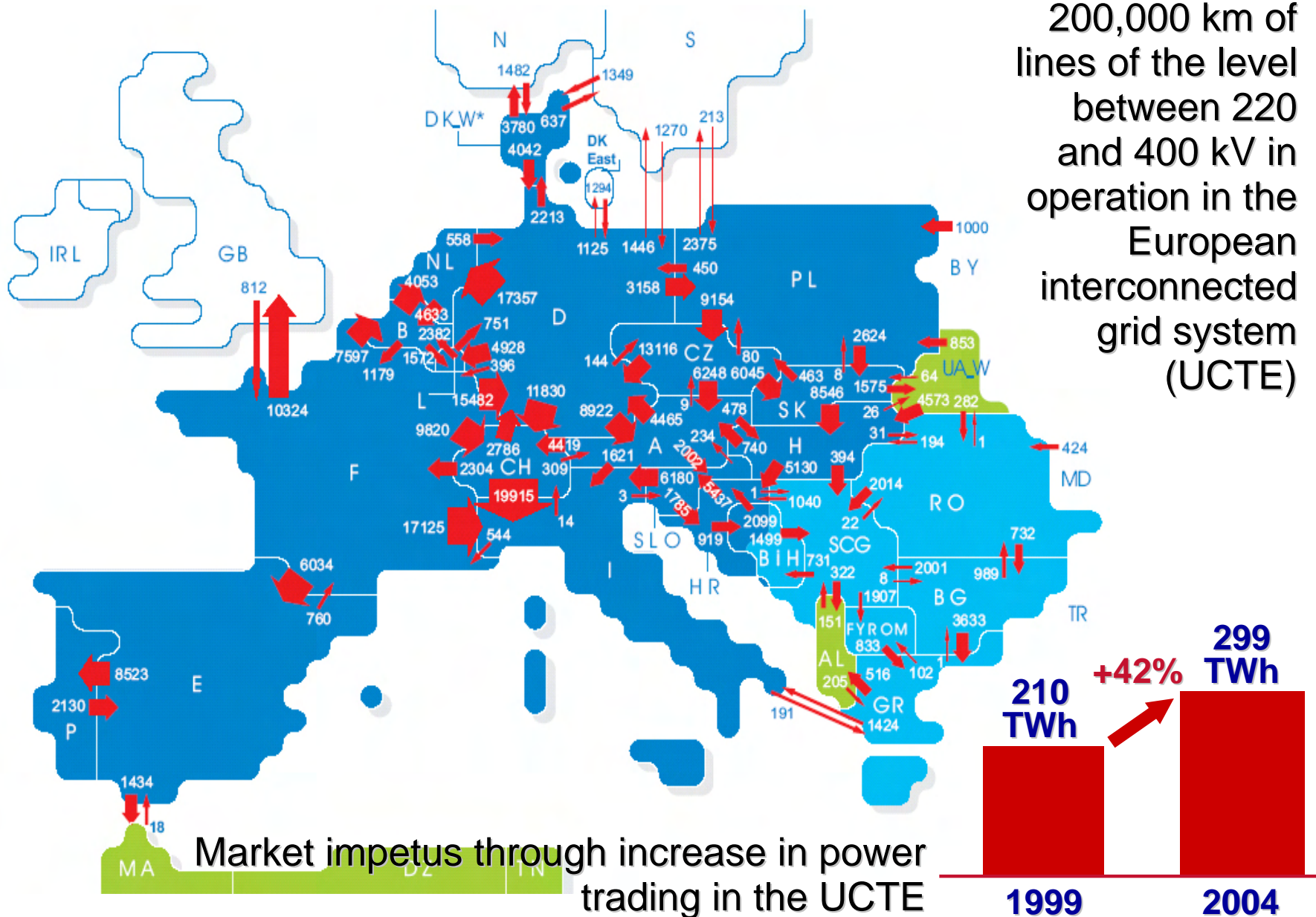
- State of Affairs
- The Energy Challenge
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- View on Nuclear Energy in Europe
- **South-East Region**
- Outlines of Selected Countries



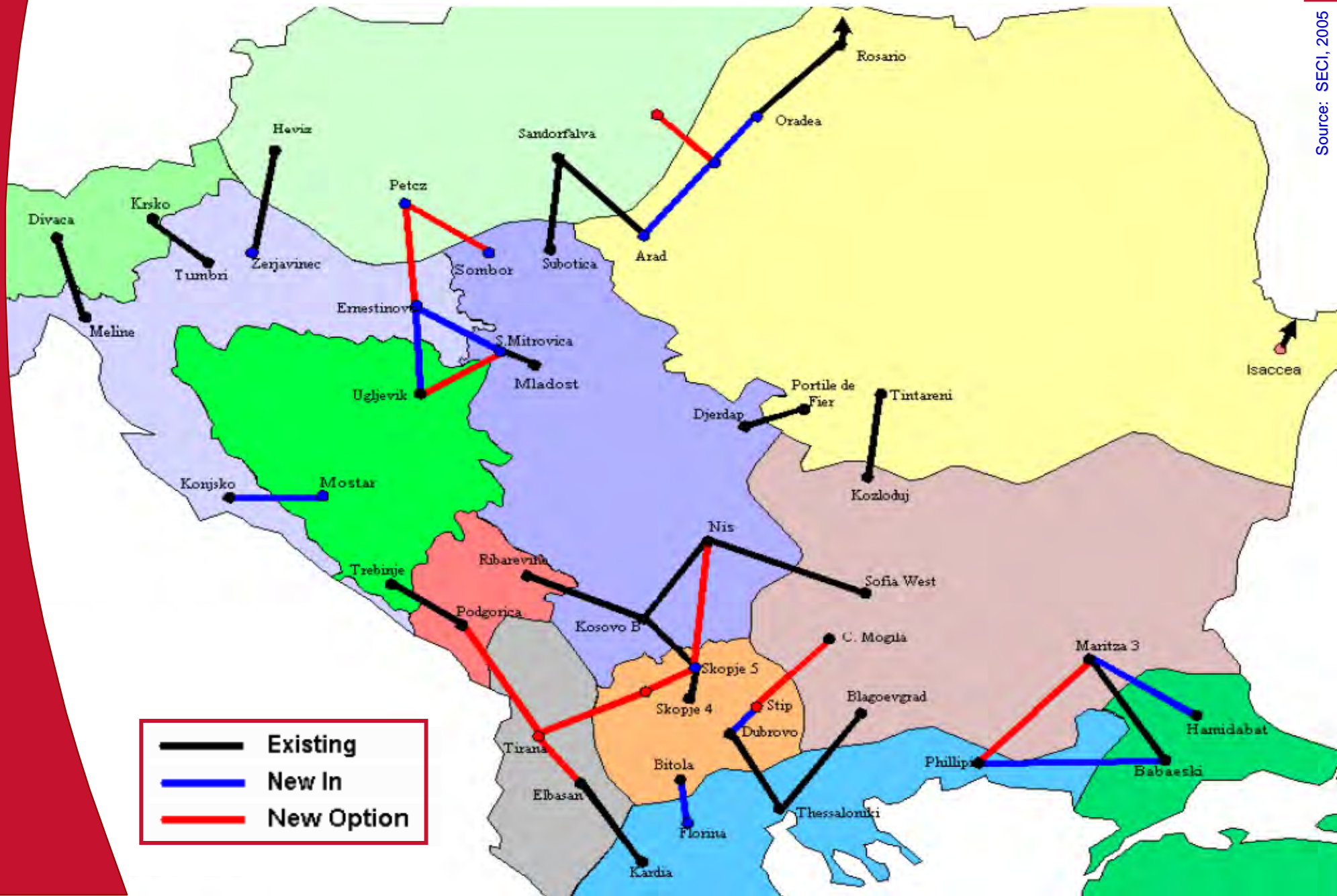
- ❑ **By 2020, electricity demand will grow by 85 TWh or 36.4% (with an annual average of 2.4%).
To meet future needs, new generating capacities of 20 GW are necessary.
This requires investments, in order of 30 billion Euro;**
- ❑ **Over the next couple of years, electricity shortages of 10 TWh should be covered by import from external suppliers;**
- ❑ **Cross-border connections are good, but the external ones are not;**
- ❑ **Refurbishing of coal-based power plants and enhancement of further connections.
Urge to build new generation capacities to meet EU-environmental standards;**
- ❑ **Diversification of energy mix is desirable to ensure the security of supplies;**
- ❑ **Energy efficiency is supposed to remain priority.**

Grid Capacities and Power Trading in Europe and South-East Region

Today there are 200,000 km of lines of the level between 220 and 400 kV in operation in the European interconnected grid system (UCTE)

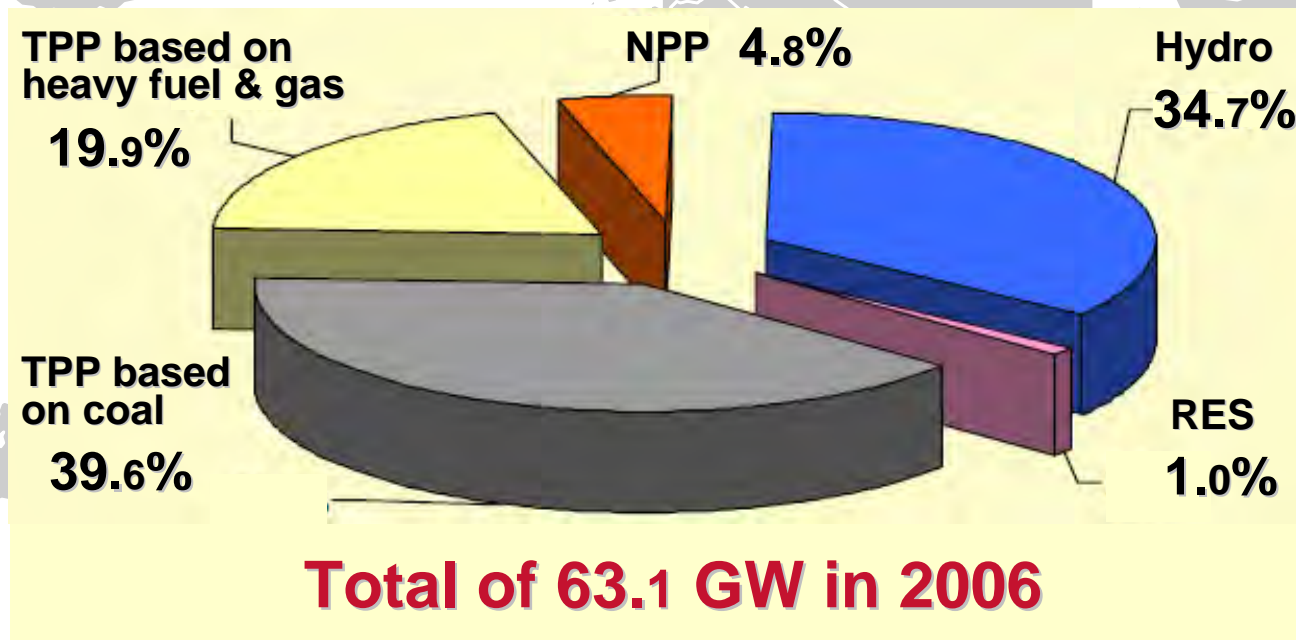


400 kV Interconnections in South-East Region (2005)



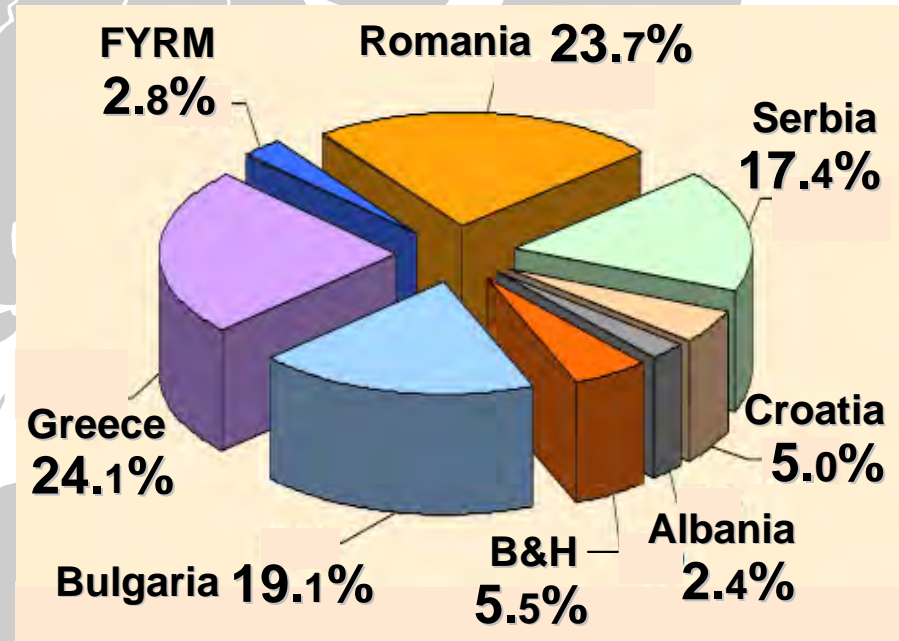
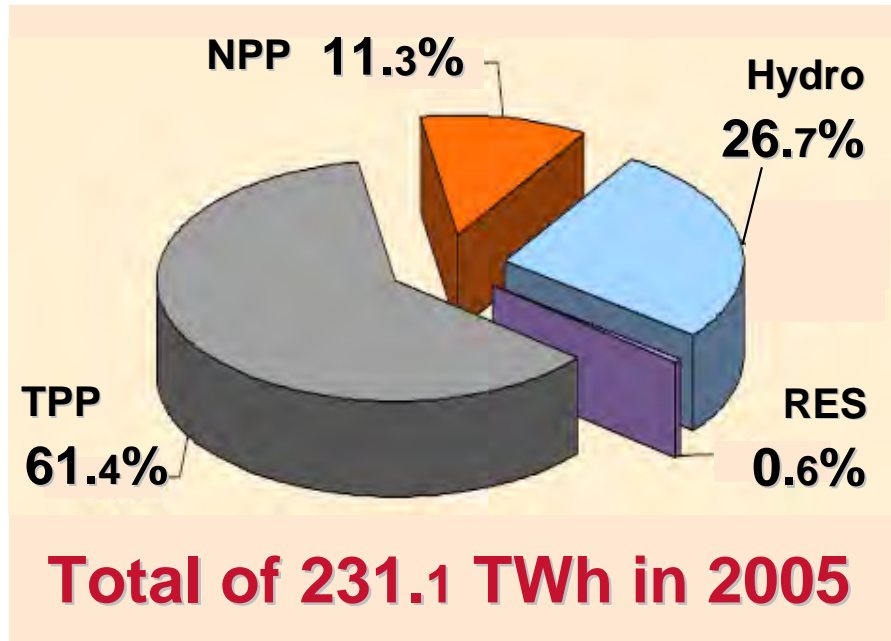
Source: SECI, 2005

Installed Regional Electricity Generating Capacity



Source: WEC, Crans Montana Forum, Tirana, Albania May 15-17, 2008

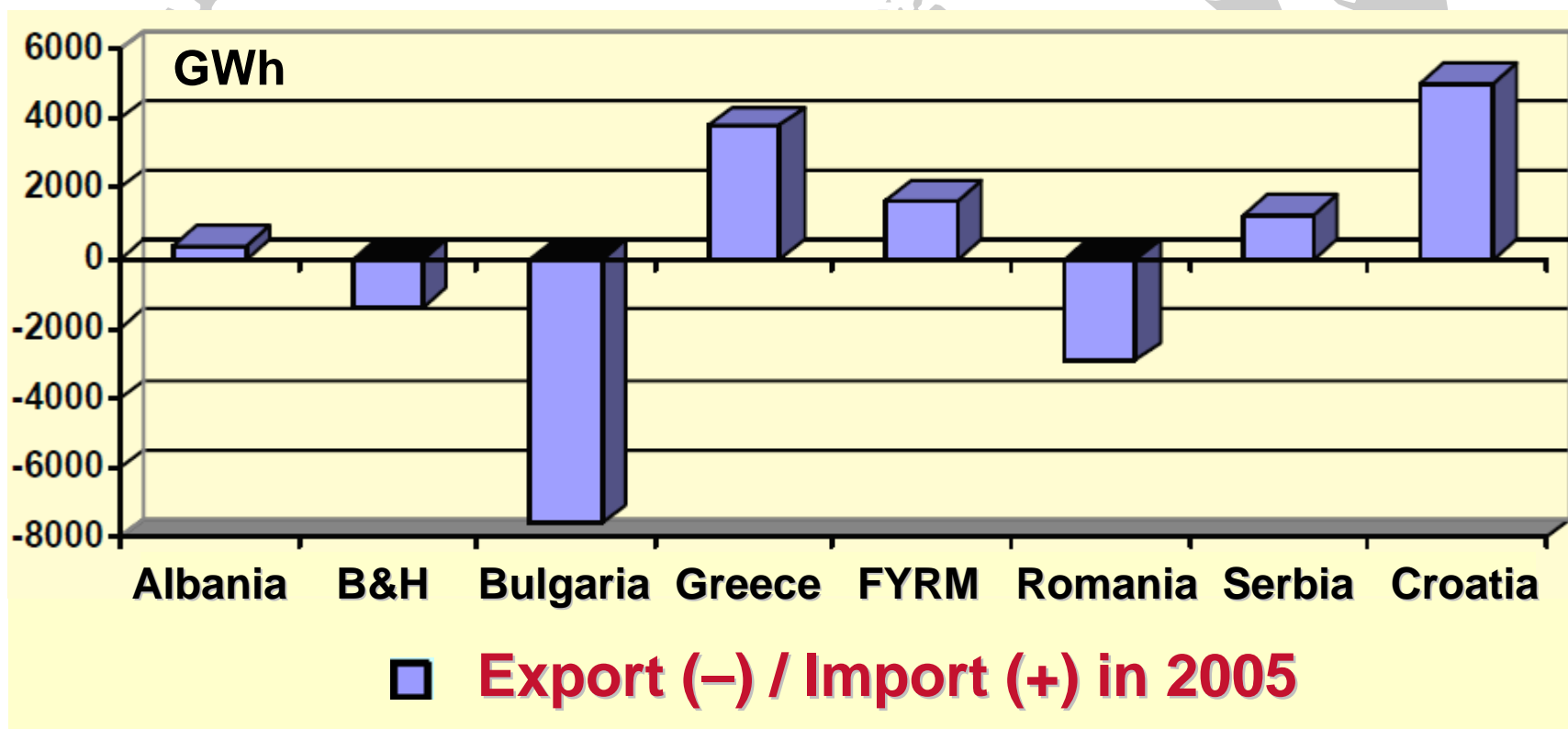
Regional Electricity Power Structure



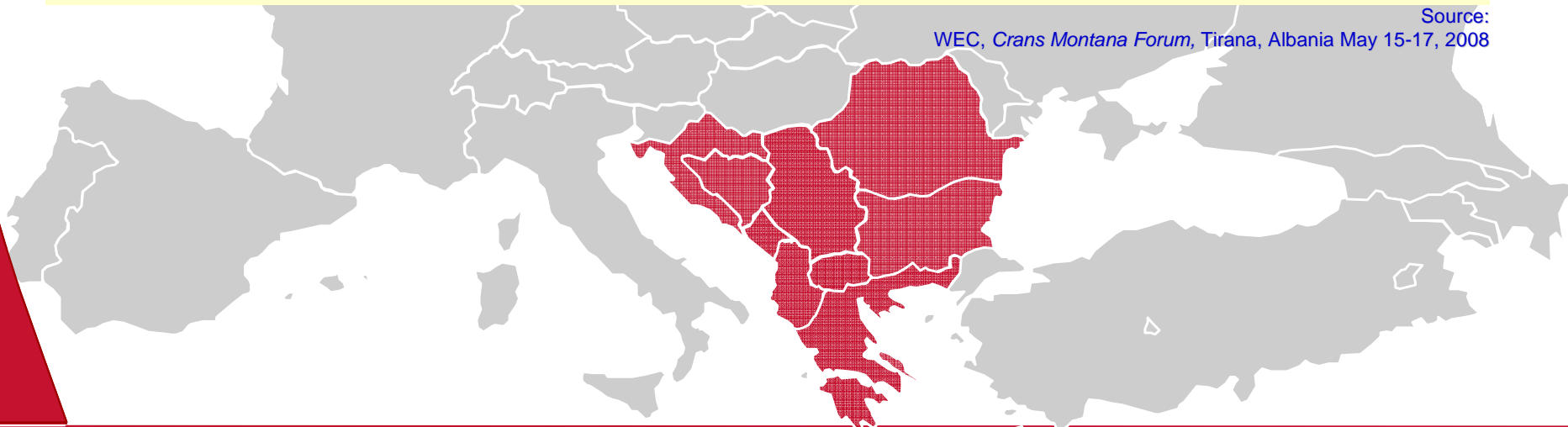
Source: WEC, Crans Montana Forum, Tirana, Albania May 15-17, 2008



Cross-Regional Exchange of Electricity



Source: WEC, Crans Montana Forum, Tirana, Albania May 15-17, 2008



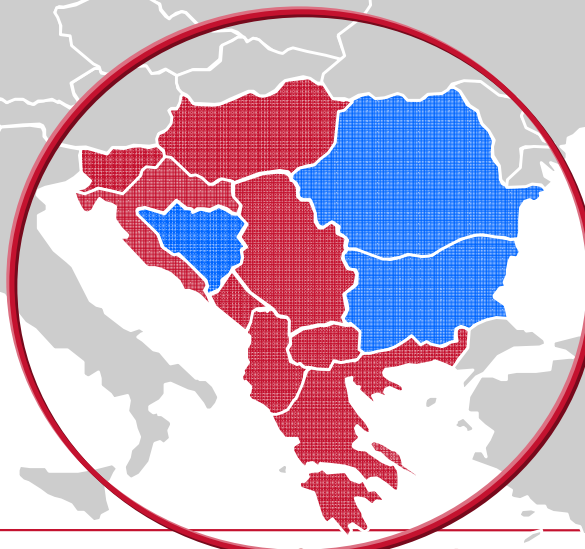
Regional Deficit in 2008 — 1/2

IMPORTERS			
COUNTRY	TWh	TWh/h	%
Hungary	-8.12	-0.93	19.9
Greece	-4.23	-0.48	7.6
Croatia	-4.21	-0.48	22.8
Slovenia	-3.75	-0.43	27.0
Albania	-3.20	-0.37	47.5
Serbia+Montenegro	-3.17	-0.36	7.0
FYR Macedonia	-3.06	-0.35	33.6
TOTAL	-29.74	-3,40	15.7

EXPORTERS			
COUNTRY	TWh	TWh/h	%
Romania	7.82	0.89	14.5
Bulgaria	2.56	0.29	6.5
Bosnia	1.04	0.12	9.2
TOTAL	11.42	1.30	10.9

Source:
Spiler J, 7th Int. Conf. on Nuclear Option in Countries with Small and Medium Electricity Grids, Dubrovnik, Croatia, May 2008

Regional
electricity deficit:
-18.32 TWh



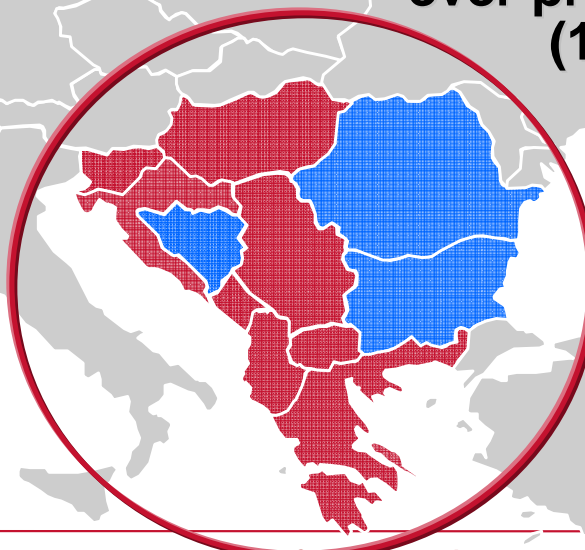
Regional Deficit in 2008 — 2/2



A city like Hamburg needs about **10 TWh** of electricity yearly

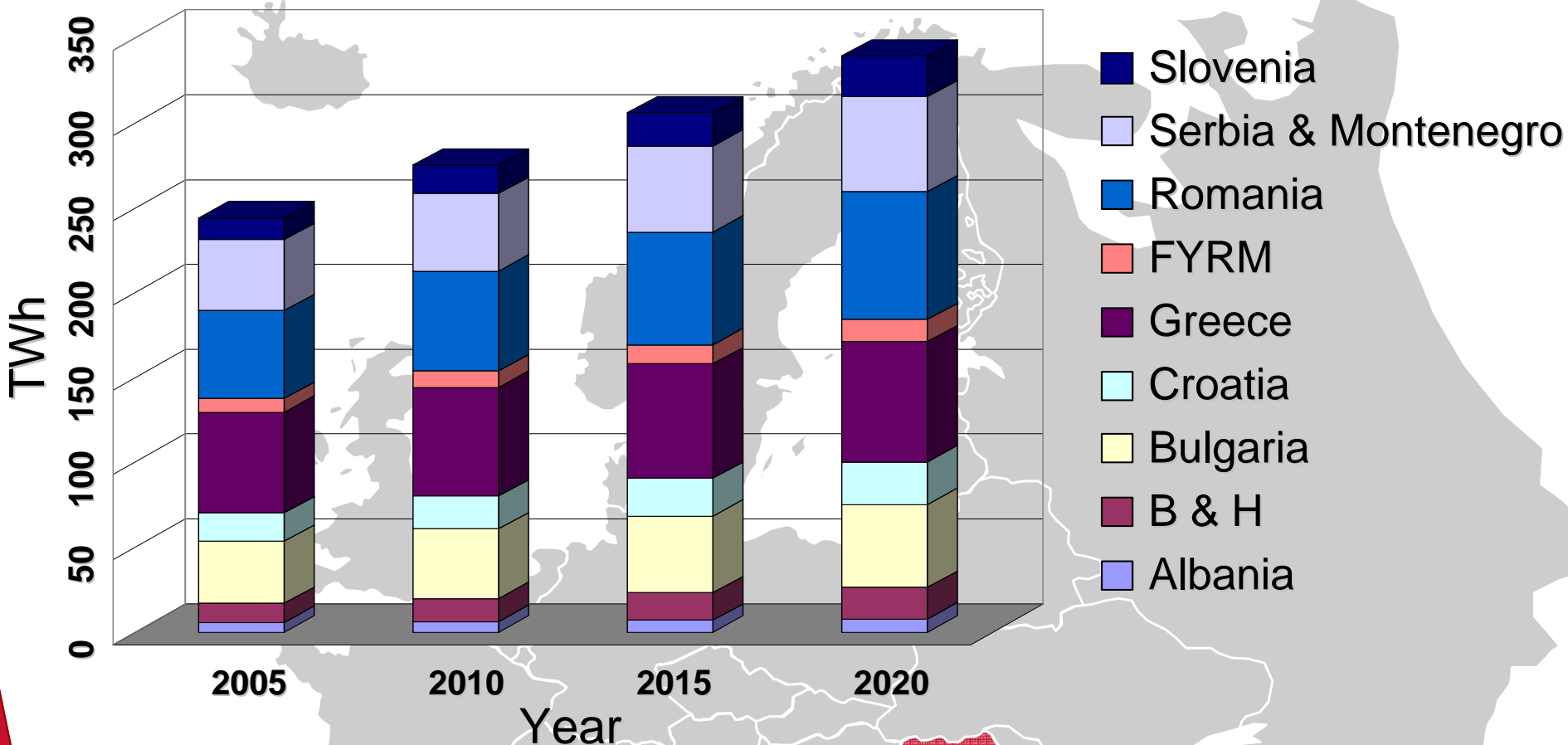
The 1997 world record of **12.53 TWh** was the greatest amount of electricity ever produced by a single NPP (1,430 MW NPP *Grohnde*)

Regional electricity deficit:
-18.32 TWh

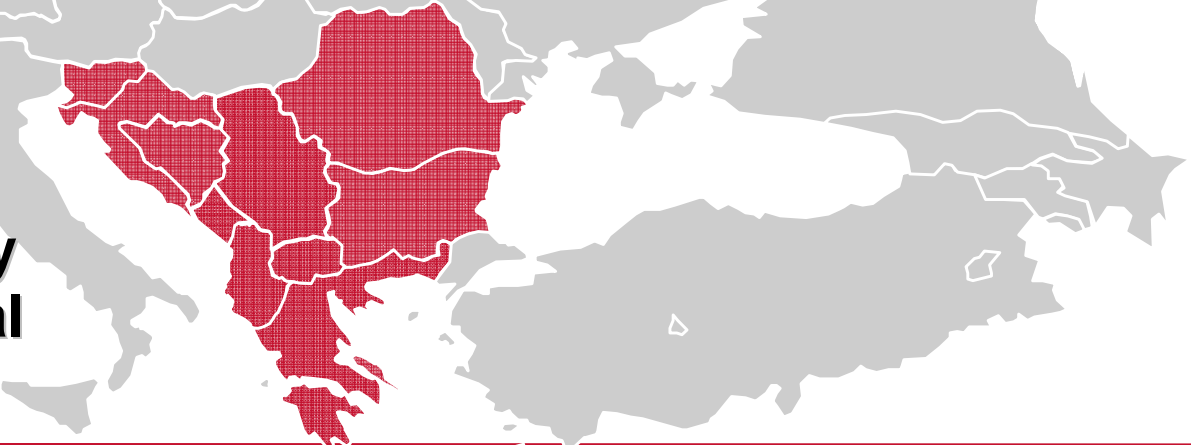


Regional capacity deficit:
-2,000 MW

Regional Electricity Demand Growth — 1/2



Between 2005 and 2020 electricity demand will grow by 39.0% with an annual average of 2.6%



Regional Electricity Demand Growth — 2/2

Country	2006 - 2010	2011 - 2015	2016 - 2020
Albania	2.0	2.0	2.0
B & H	4.0	3.5	3.0
Bulgaria	2.0	2.0	1.5
Croatia	3.0	3.0	2.5
Greece	1.5	1.5	1
FYRM	4.0	3.0	3.0
Romania	2.5	2.5	2.5
Serbia + Montenegro	2.0	2.0	2.0

Between 2005 and 2020 electricity demand will grow by 36.4% with an annual average of 2.4%

Without Slovenia

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Selected Countries

Ljubljana



Slovenia

Zagreb



Croatia

Beograd



Serbia

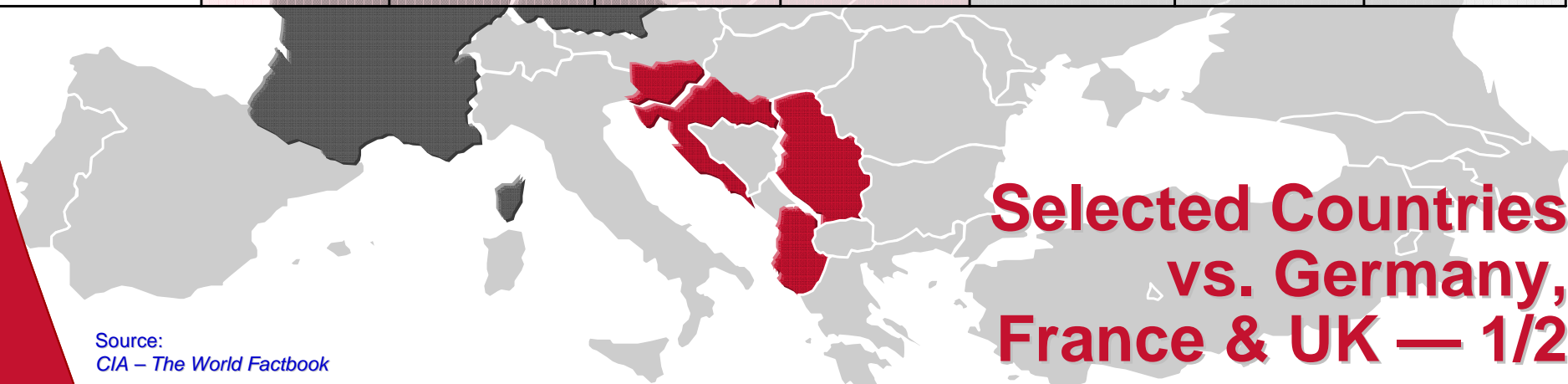


Tirana



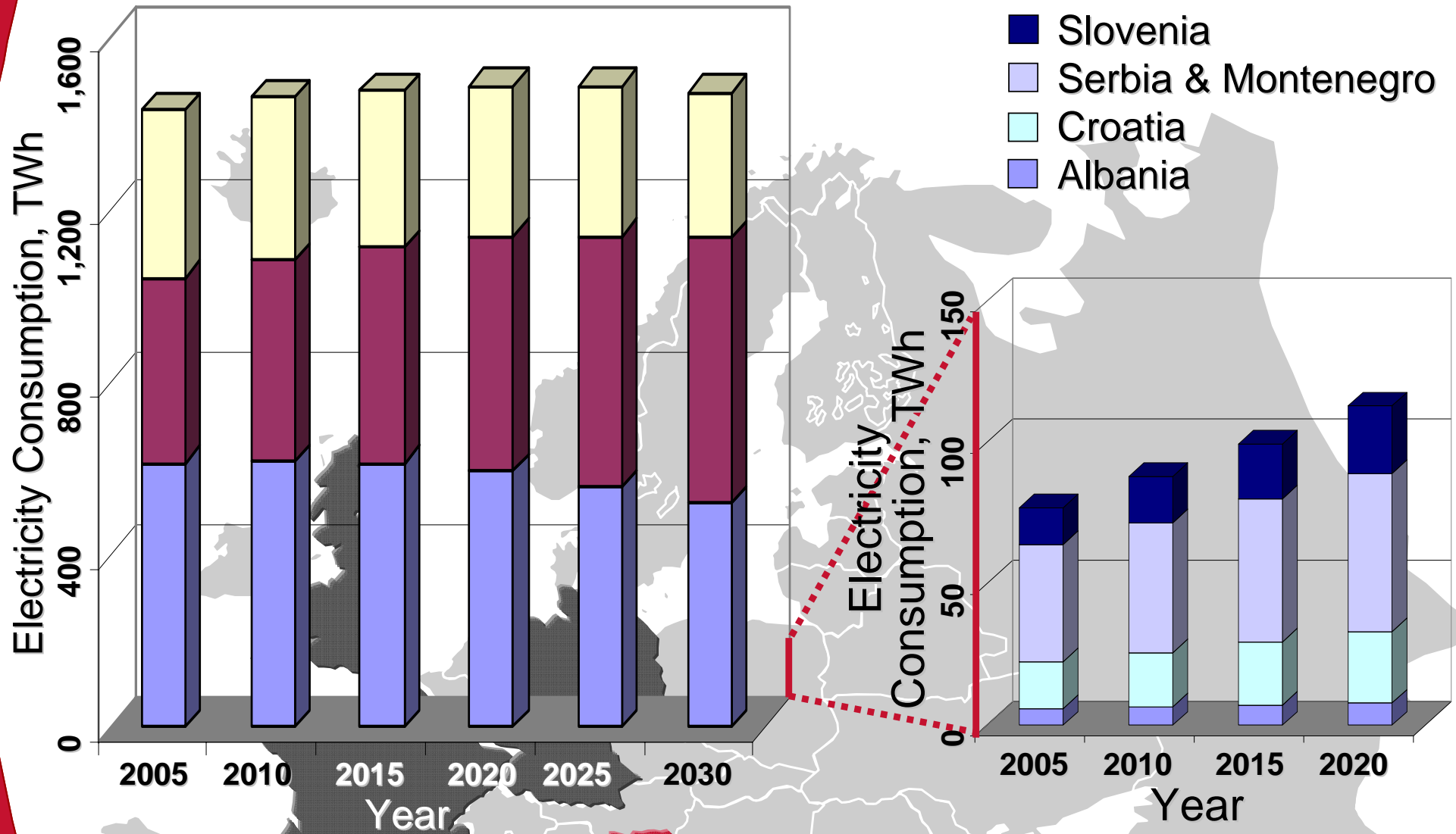
Albania

	Slovenia	Croatia	Serbia	Albania	Germany	France	UK
Population	2 mill. (July 2008 est)	4.5 mill. (July 2008 est)	10.2 mill. (July 2008 est)	3.6 mill. (July 2008 est)	82.4 mill. (July 2008 est)	64.1 mill. (July 2008 est)	61.1 mill. (July 2009 est)
GDP per capita	\$30,800 (2008 est.)	\$16,900 (2008 est)	\$10,400 (2008 est)	\$6,400 (2008 est)	\$34,800 (2008 est)	\$32,700 (2008 est)	\$37,400 (2008 est)
GDP real growth rate	4.5% (2008 est)	4.8% (2008 est)	7.3% (2007 est)	6% (2008 est)	1.7% (2008 est)	0.7% (2008 est)	1.1% (2008 est)
Education expenditures	6% of GDP (2005)	4.5% of GDP (2004)	NA	2.9% of GDP (2002)	4.6% of GDP (2004)	5.7% of GDP (2005)	5.6% of GDP (2005)
Industrial production growth rate	4.5% (2008 est)	2.9% (2008 est)	1.8% (2007 est)	3% (2008 est)	2.2% (2008 est)	-8% (2008 est)	-0.1% (2008 est)
Budget:	(2008 est)	(2008 est)	(2007 est)	(2008 est)	(2008 est)	(2008 est)	(2008 est)
– revenues	\$23.16 bill.	\$23.71 bill.	\$9.6 bill.	\$3.771 bill.	\$1.614 trill.	\$1.439 trill.	\$1.107 trill.
– expenditures	\$22.93 bill.	\$23.46 bill.	\$9.8 bill.	\$4.538 bill.	\$1.579 trill.	\$1.525 trill.	\$1.242 trill.
Public debt	22% of GDP (2008 est)	49% of GDP (2008 est)	37% of GDP (2007 est)	51% of GDP (2008 est)	63% of GDP (2008 est)	67% of GDP (2008 est)	47% of GDP (2008 est)
Population below poverty line	12.9% (2004)	11% (2003)	6.5% (2007 est)	25% (2004 est)	11% (2001 est)	6.2% (2004)	14% (2006)
Inflation rate	6% (2008 est)	6.3% (2008 est)	6.8% (2007)	4% (2008 est)	2.8% (2008 est)	1% (2008 est)	3.8% (2008 est)



Selected Countries vs. Germany, France & UK — 1/2

Source:
CIA – The World Factbook



Source:
CIA - The World Factbook

Selected Countries vs. Germany, France & UK — 2/2

Countries' Balance

	Slovenia	Croatia	Serbia	Albania
Production	14.13 TWh (2007 est)	12.25 TWh (2007)	33.87 TWh (2004)	2.892 TWh (2007 est)
Production by Source	fossil fuel: 35.2% hydro: 27.3% nuclear: 36.8% other: 0.7% (2001)	fossil fuel: 33.6% hydro: 66.0% nuclear: 0.0% other: 0.4% (2001)	fossil fuel: 73.2% hydro: 25.6% nuclear: 0.0% other: 1.2% (2007)	fossil fuel: 2.9% hydro: 97.1% nuclear: 0.0% other: 0.0% (2001)
Consumption	13.4 TWh (2006 est)	18.61 TWh (2007)	25.787 TWh (2004)	3.607 TWh (2007 est)
Import	6.14 TWh (2007 est)	7.511 TWh (2007)	11.23 TWh (2004)	2.8 TWh (2007 est)
Export	5.894 TWh (2007 est)	1.451 TWh (2007)	12.05 TWh (2004)	0.0 TWh (2007 est)

Source:
CIA – The World Factbook

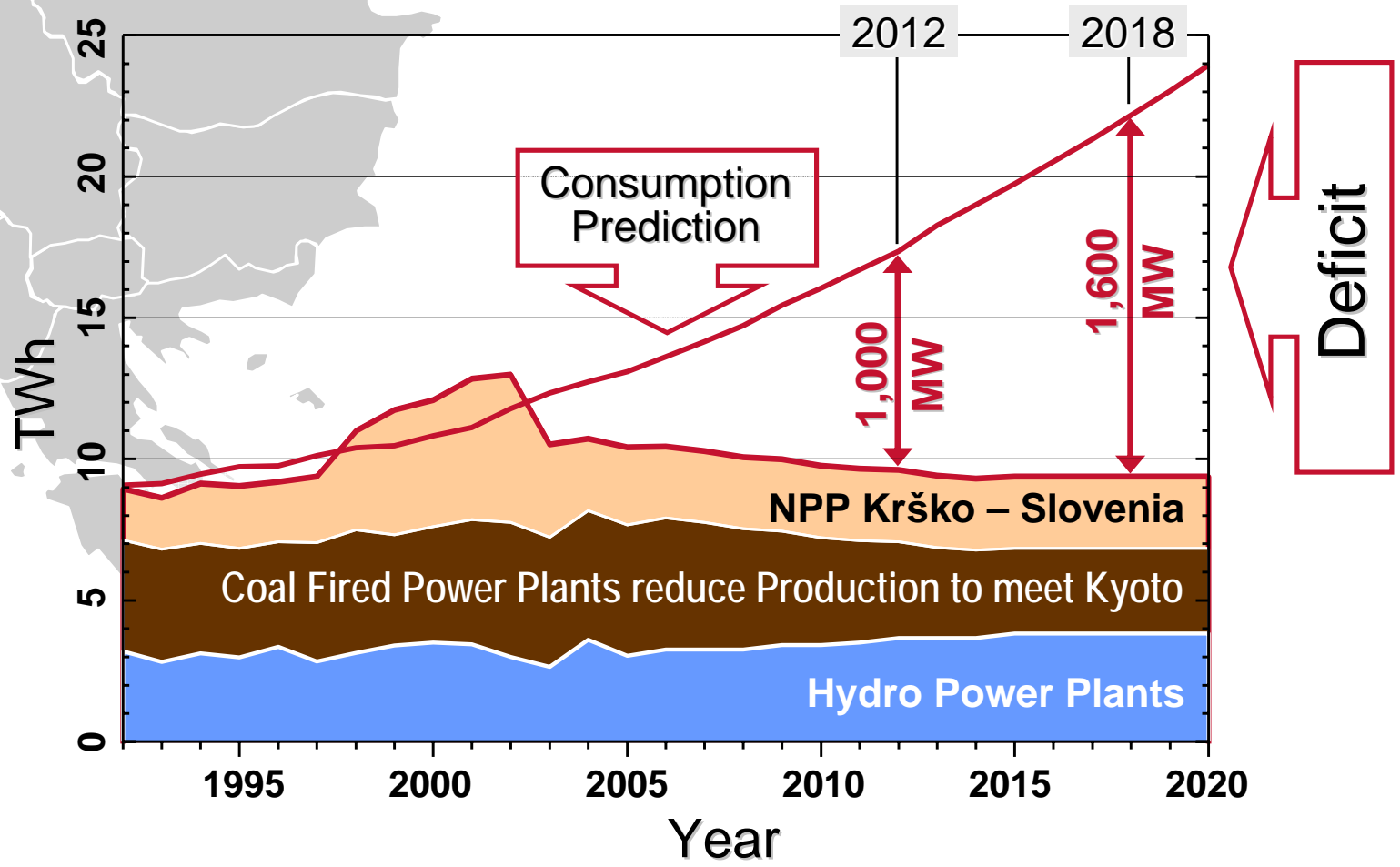




- ❑ Data for 2007 shows that power plants produced 10.40 TWh, out of those
 - ❖ Hydro 27%
 - ❖ Thermal 46%
 - ❖ Nuclear (Slovenian part 50% of NEK) 26%.
- ❑ Remaining consumption serviced through energy import.
- ❑ Import steadily increased during the last three years. Last year it accounted for more than 21% of the total consumption (21%=2.94 TWh).
- ❑ Conditions in 2009 and 2010 are expected to be more stable due to the current recession. On the long term, the basic problem remains.
- ❑ The present situation in the electric power system opens a variety of questions of how to secure a reliable and high-quality power supply given the economic and environmental criteria.



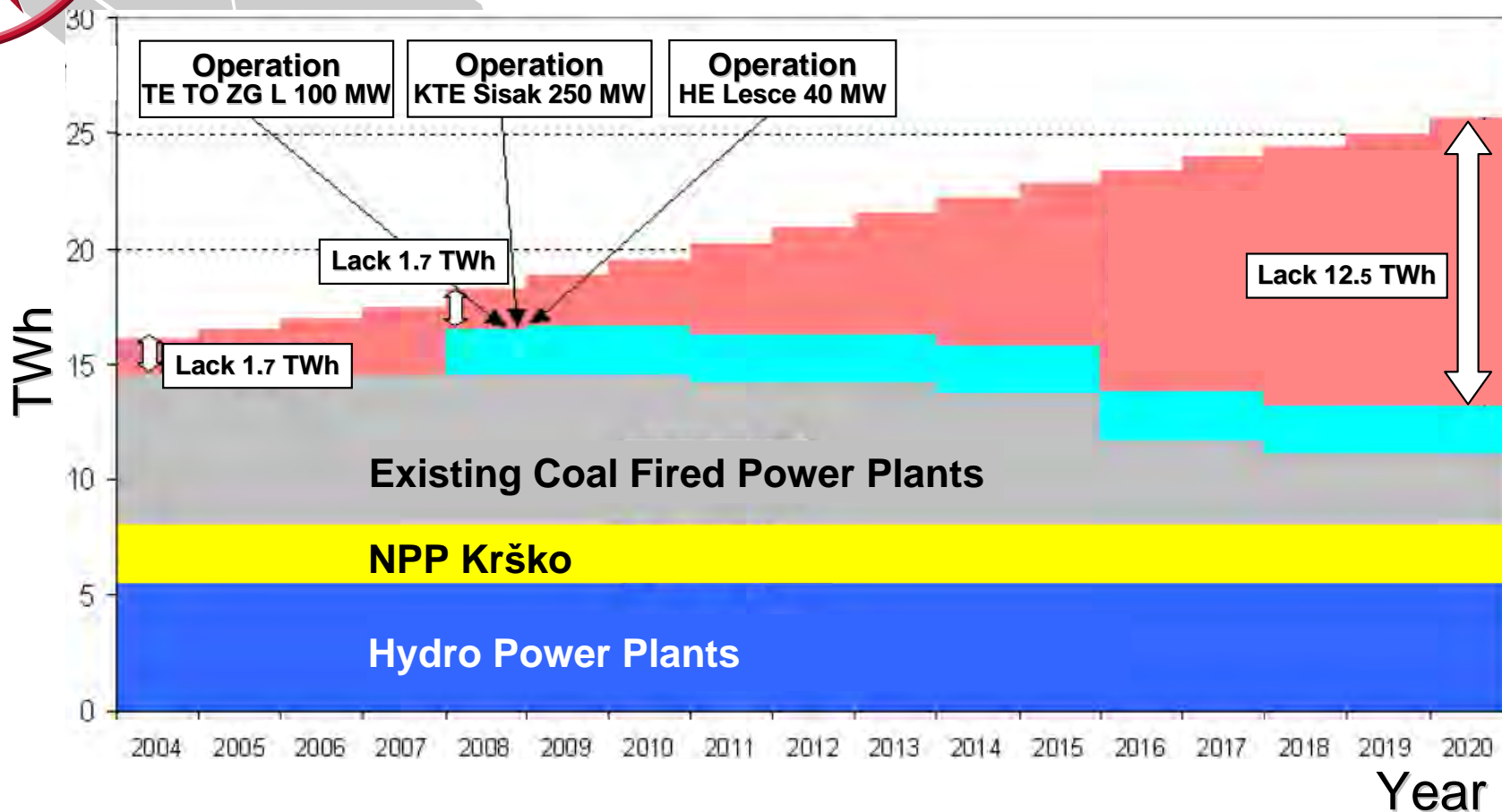
Outlook in Slovenia



Source: Spiler J, 7th Int. Conf. on Nuclear Option in Countries with Small and Medium Electricity Grids, Dubrovnik, Croatia, May 2008



Source:
Cavlina N, 7th Int. Conf. on *Nuclear Option in Countries with Small and Medium Electricity Grids*, Dubrovnik, Croatia, May 2008

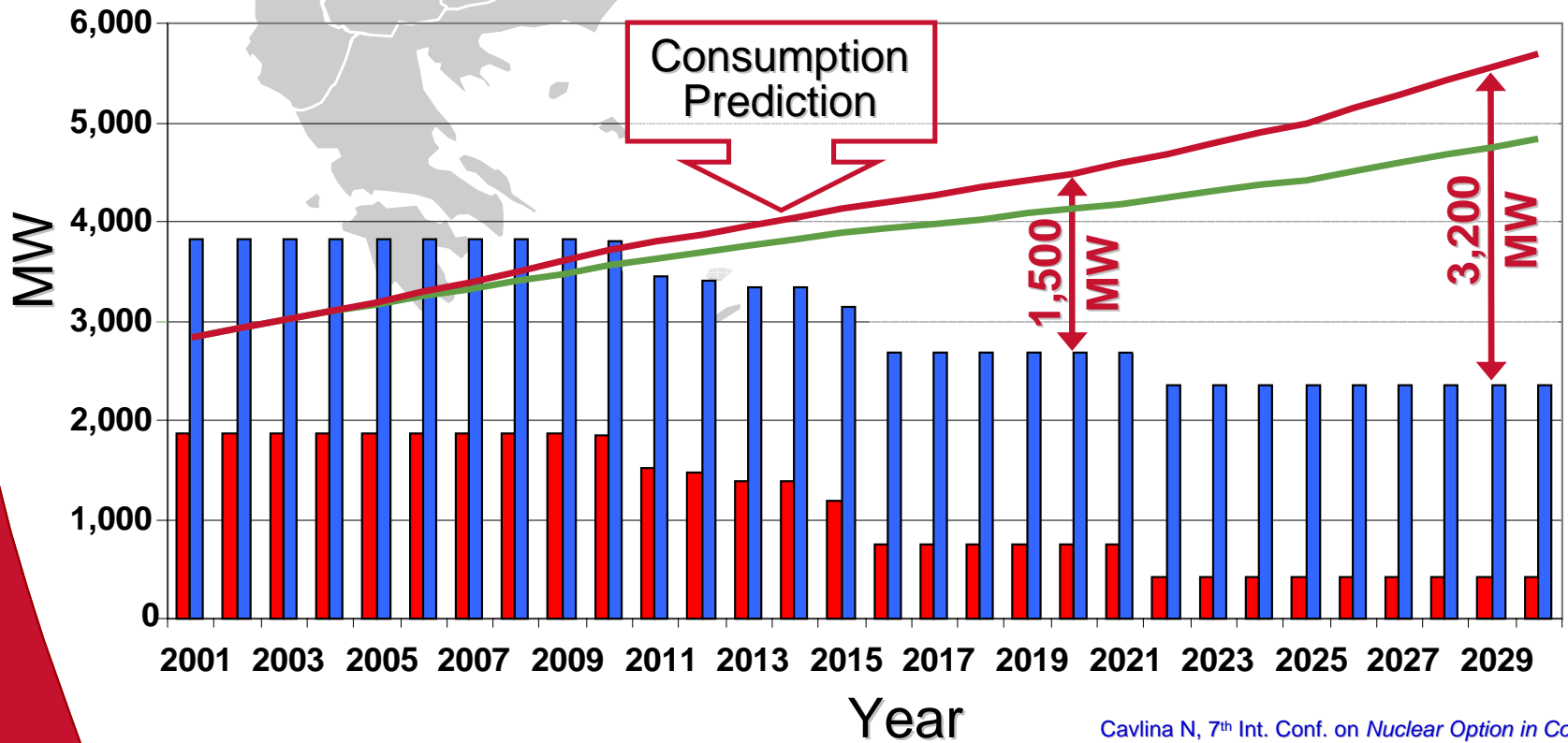




Outlook in Croatia



■ Fixed System Thermal ■ Fixed System Total
— Peak Load Ref. 2.86% — Peak Load High 3.33%



Deficit

Source: Cavlina N, 7th Int. Conf. on Nuclear Option in Countries with Small and Medium Electricity Grids, Dubrovnik, Croatia, May 2008



Power Sector in Serbia



Installed Capacity (MW) 2000–2009

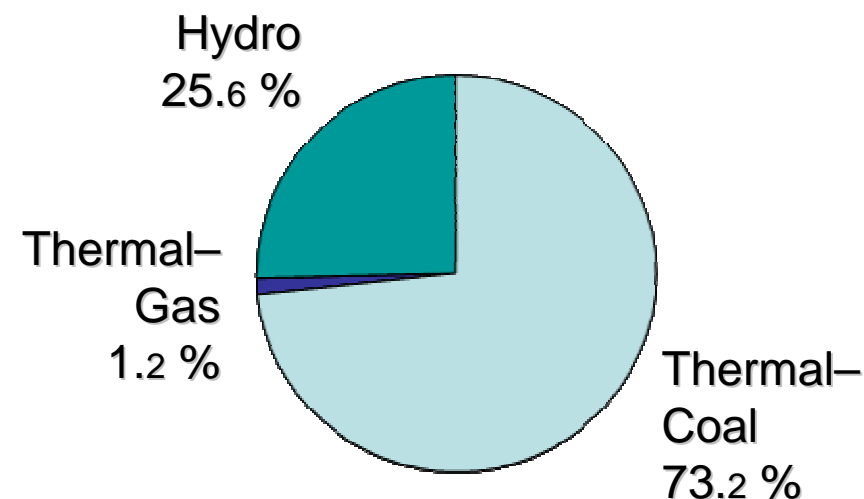
Thermal Power Plants	Co - Generation	Hydro Power Plants	Total
3,936	353	2,831	7,120

Source: Serbian Utility EPS, February 2009

Concerning the total primary energy consumption 58% are provided by domestic energy sources, where low caloric lignite plays the dominant roll. Crude oil, oil derivates, natural gas and small amounts of coal and electricity are imported, and they represent 42% of the total primary energy consumption.

Serbia has poor energy resources. Resources of oil and gas are scarce and about 80% of oil and 90% of gas consumed is imported.

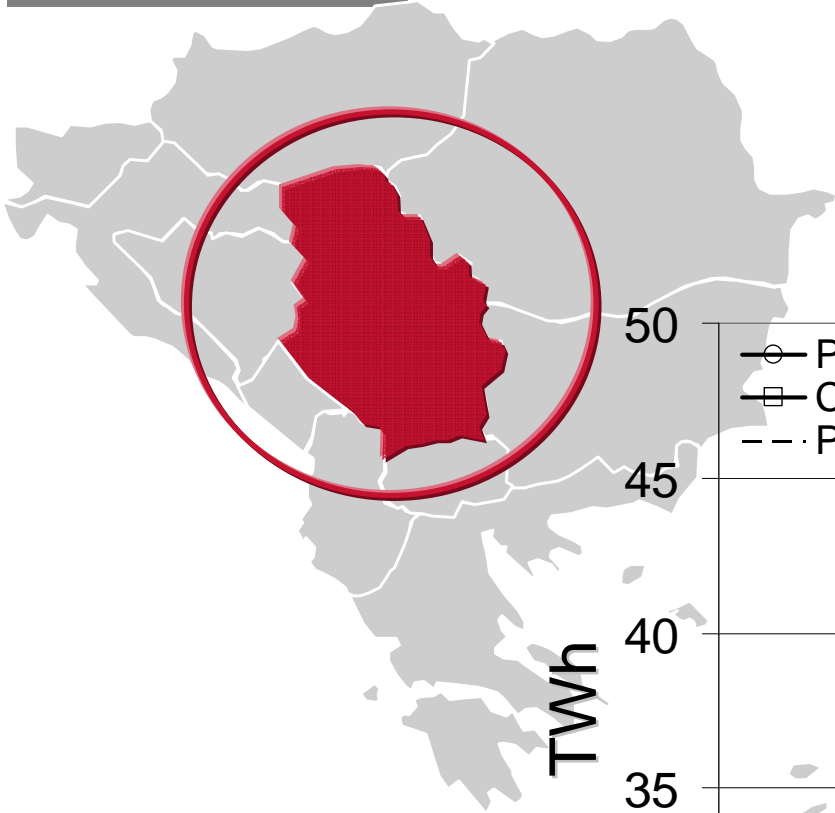
The main energy reserves consist of lignite. In 2008 the dependence on import was 41.65%.



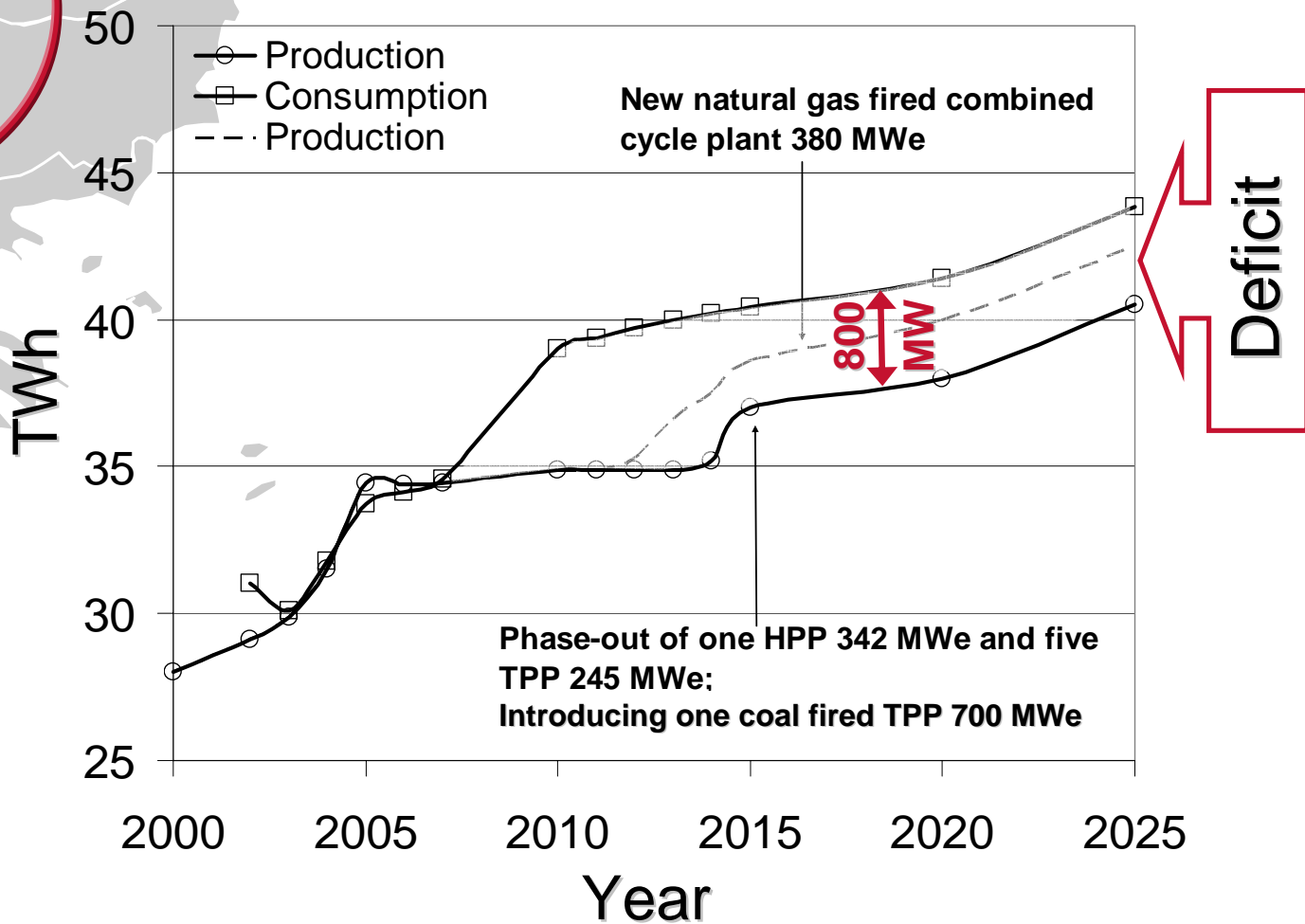
Share in total electricity production (34.4 TWh) in 2007



Outlook in Serbia

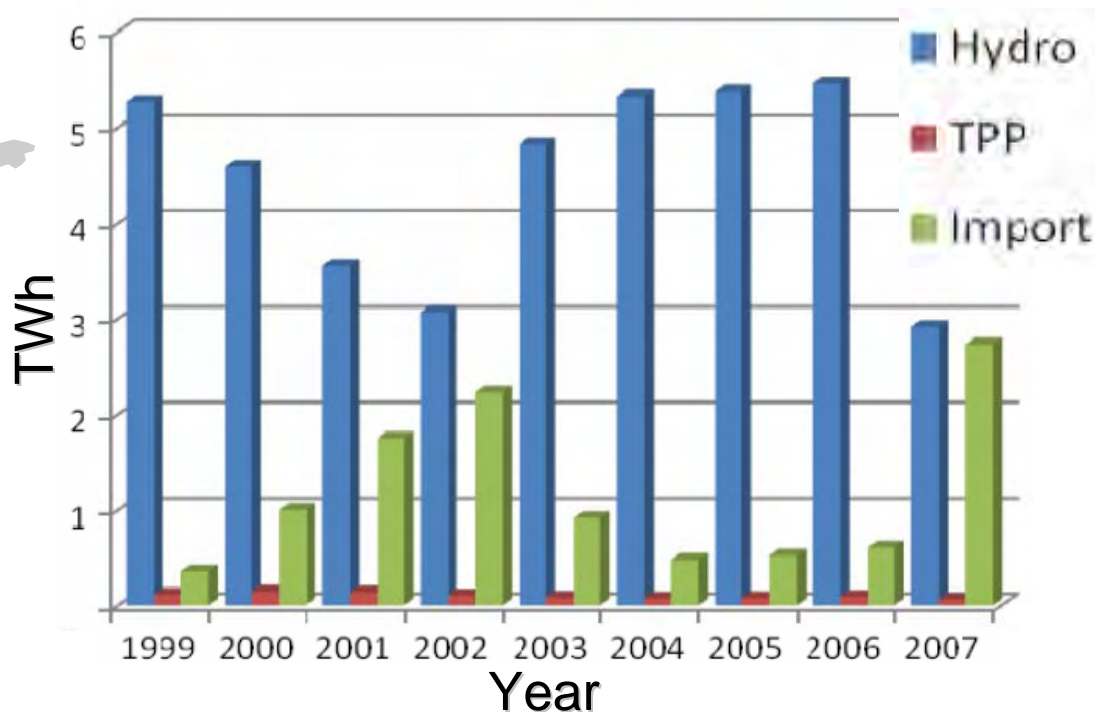


Source:
Serbian Utility EPS, March 2009





Power Sector in Albania



Source: AKBN, Crans Montana Forum, Tirana, Albania May 15-17, 2008

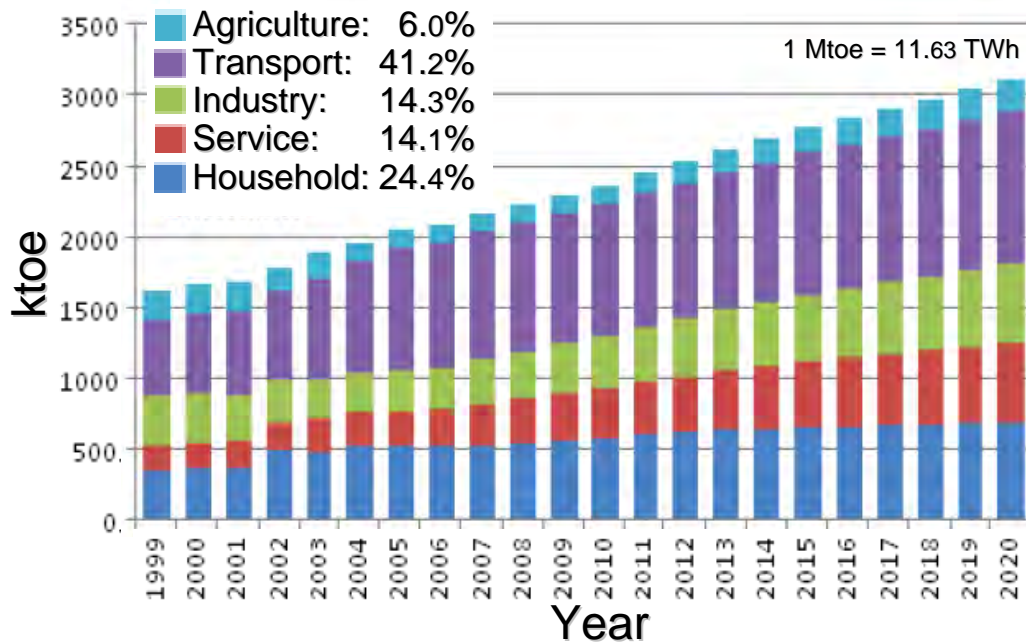
- ❑ Power generation by Hydro Power Plants is 5,500 GWh/year
- ❑ Power generation by Thermo Power Plant (TPP) is 100 GWh/year
- ❑ Import of electricity varies from 1,000–2,700 GWh/year
- ❑ Electricity demand is 6,700 GWh/year
- ❑ Electricity supply is 5,665 GWh/year



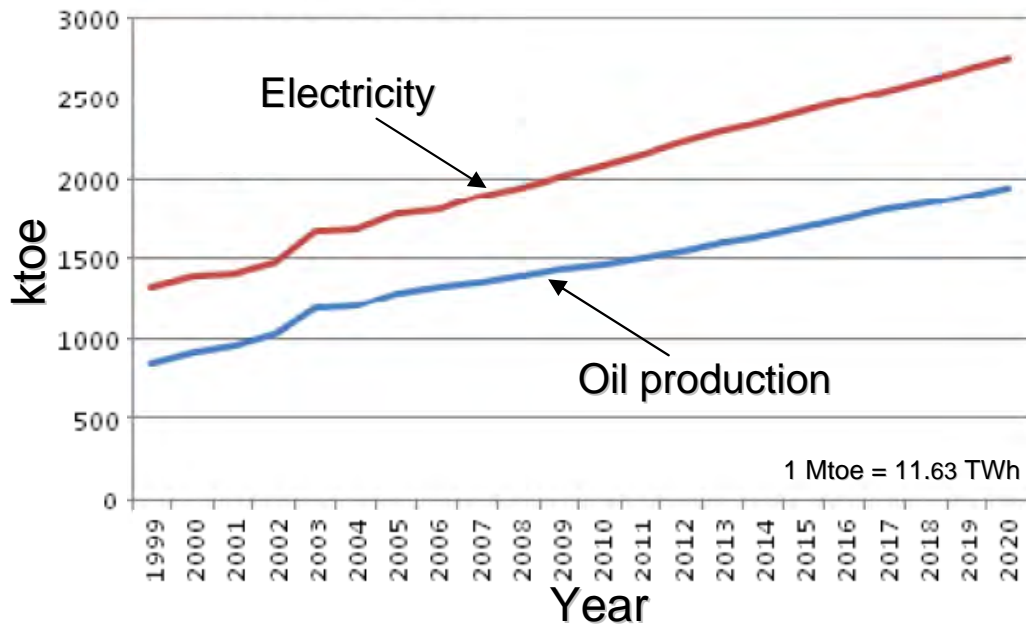
Outlook in Albania



Energy Consumption by Sectors



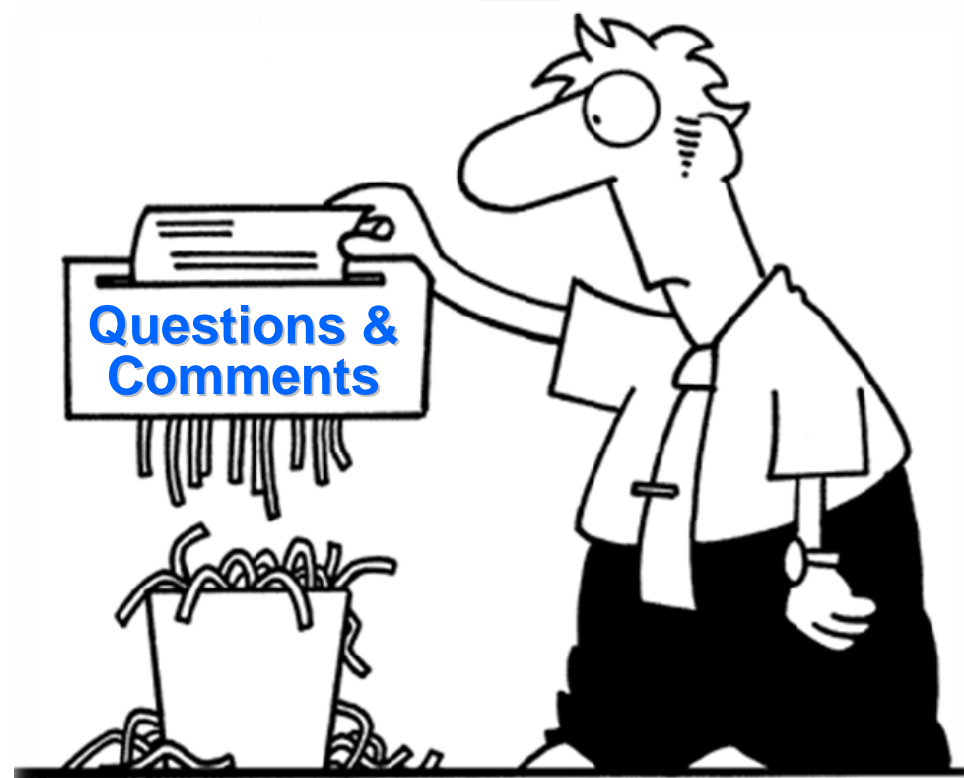
Energy Consumption for Oil Production and Electricity



Source:

AKBN, Crans Montana Forum, Tirana, Albania May 15-17, 2008

Thank You for Your Attention



HND Forum
Zagreb, CROATIA, April 22nd 2009