

Nuclear Power in Germany

A short overview

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Nuclear Power in Germany

- 1950-1960 very positive atmosphere about nuclear energy
 - All political parties supported nuclear energy development
 - Basically no political opposition
 - Clear restriction to the peaceful use of nuclear energy
- 1957 first western german nuclear research reactor FRM in Munich
- 1960 first western german nuclear power reactor in Kahl (Main)
- Commercial availability of light water reactor concepts and impact of oil crisis in the 1970s increased industrial interest in nuclear power
- 70s and 80s highest number of nuclear new built, but at the same time increased debate about nuclear safety questions
- 1979 TMI accident in the USA

Nuclear Power debate in Germany

- 1983 Green Party wins first seats in the federal parliament
- 1986 Tchernobyl accident in Ukraine enhances safety debate
- 1989 last start up of a nuclear power plant in Germany
- 1990s: Social Democrats and Green Party focus on nuclear phase out, three major arguments
 - Reactor safety
 - Final disposal of nuclear waste
 - Nuclear non-proliferation
- 1998: Coalition of SPD and Green Party win federal elections
- 14.06.2000: Agreement between SPD/Green coalition and electricity utilities about nuclear phase out is signed

Nuclear Power debate in Germany

- Christian Democrats and Liberal Party declare their resistance

Quotes on the nuclear phase out consensus of 14. Juni 2000:

Gerhard Schröder (SPD), Chancellor:

„Mit den soeben geleisteten Unterschriften haben wir uns abschließend darauf verständigt, die Nutzung der Kernenergie geordnet und wirtschaftlich vernünftig zu beenden.“

Jürgen Trittin (Die Grünen), Federal Environmental Minister:

„Die Regellaufzeit wird auf 32 Jahre begrenzt. Im Jahre 2020 wird aller Voraussicht nach das letzte AKW hier vom Netz gehen.“

Klaus Lippold (CDU), Energy- and Nuclear Expert of the Opposition:

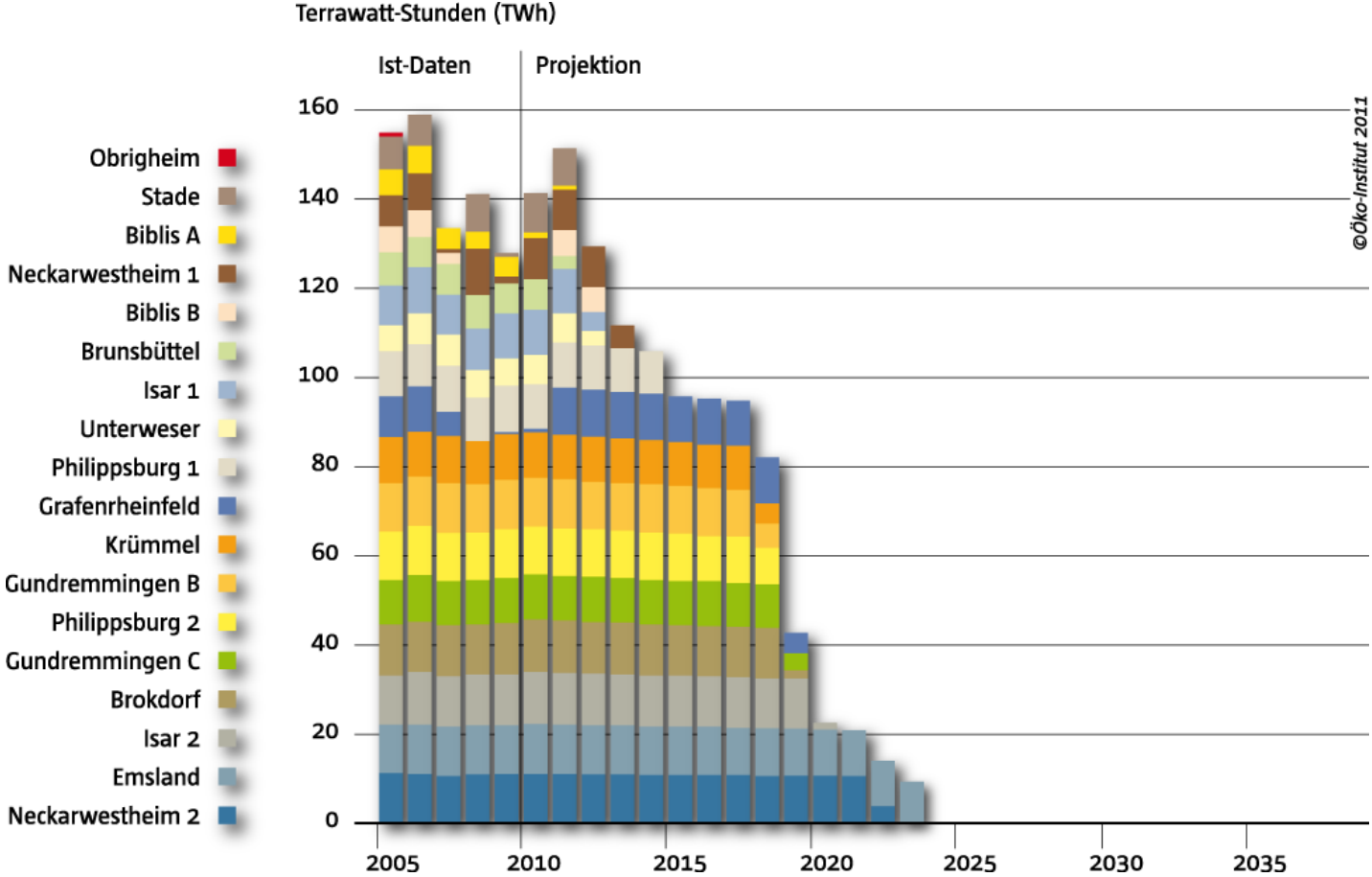
„Herr Trittin, Sie freuen sich zu früh, wir werden das, was Sie als Kernenergieausstieg bezeichnen, wieder rückgängig machen.“

Nuclear Power debate in Germany

22.04.2002: Change of §1 of the Atomic Law

- Before: promotion of research, development and use of nuclear energy
- Now: phase out of commercial use of nuclear power
- Lifetimes are restricted by electricity production limits (corresponding to about 32 years of operation), no fixed date
- Prohibition of new nuclear built
- Prohibition of reprocessing of spent fuel

Estimate of reactor lifetimes according to Atomic Law of 2002



Restructuring of energy production system



- 95% reduction in greenhouse gas emission in highly industrialised countries?
- What implications?
 - Timeline
 - Innovation strategies
 - Restrictions
 - Costs
- Climate policy
 - Longterm strategies (bis 2050)
 - political options (bis 2030)

Restructuring of energy production system



Nuclear Power debate in Germany

- 2009 new coalition of CDU/FDP

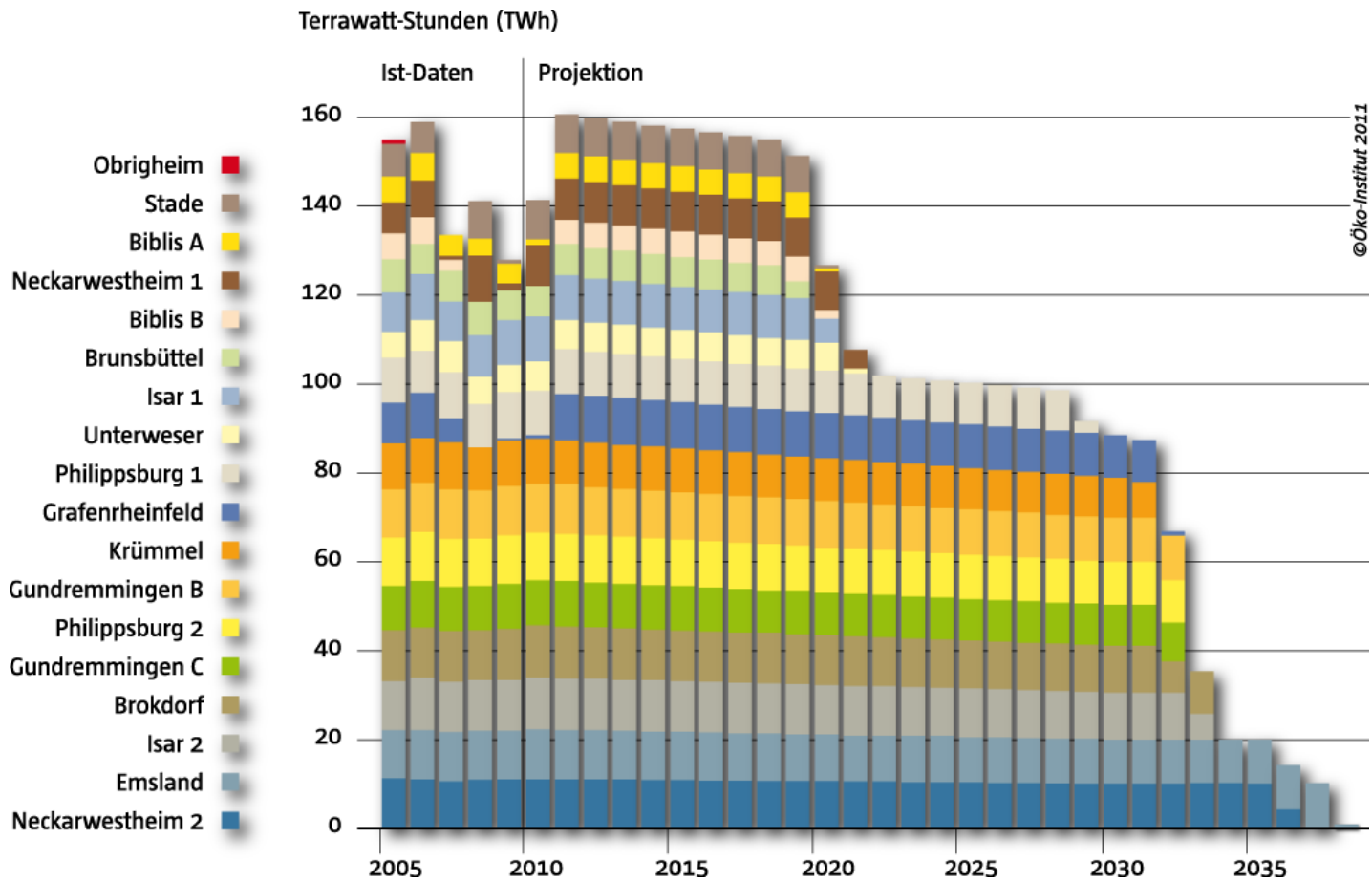
Change of the Atomic Law in 2010:

- Lifetimes are prolonged by about 12 years on average, expressed in additional electricity production capacities

But no change with respect to:

- §1 still requests phase out of commercial use of nuclear power
- Prohibition of new nuclear built
- Prohibition of reprocessing of spent fuel

Estimate of reactor lifetimes according to Atomic Law of 2010

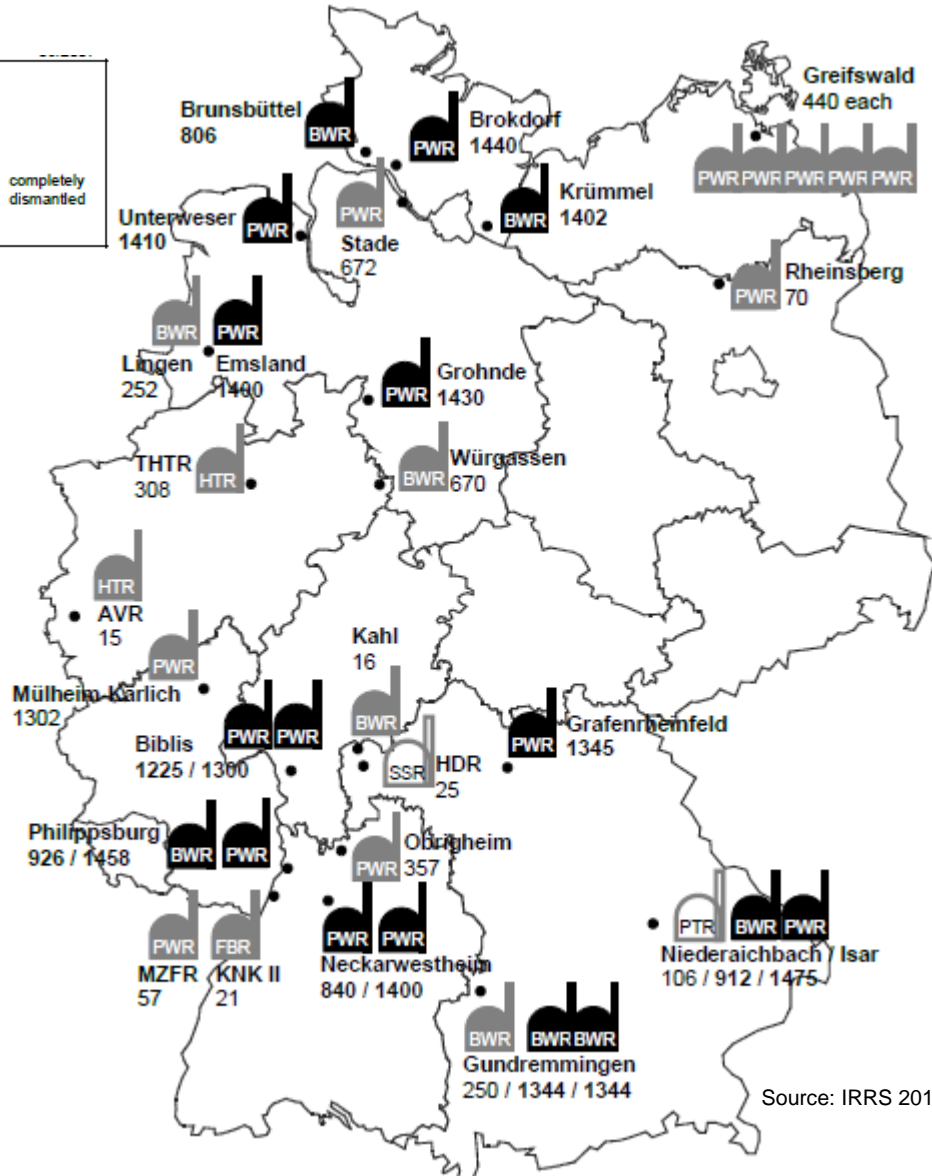


Nuclear Power in Germany März 2011

Legend

PWR	Pressurized Water Reactor	in operation	
BWR	Boiling Water Reactor	shut down	
FBR	Fast Breeder Reactor	completely dismantled	
HTR	High Temperature Reactor		
PTR	Pressure Tube Reactor		
SSR	Superheated Steam-Cooled Reactor		

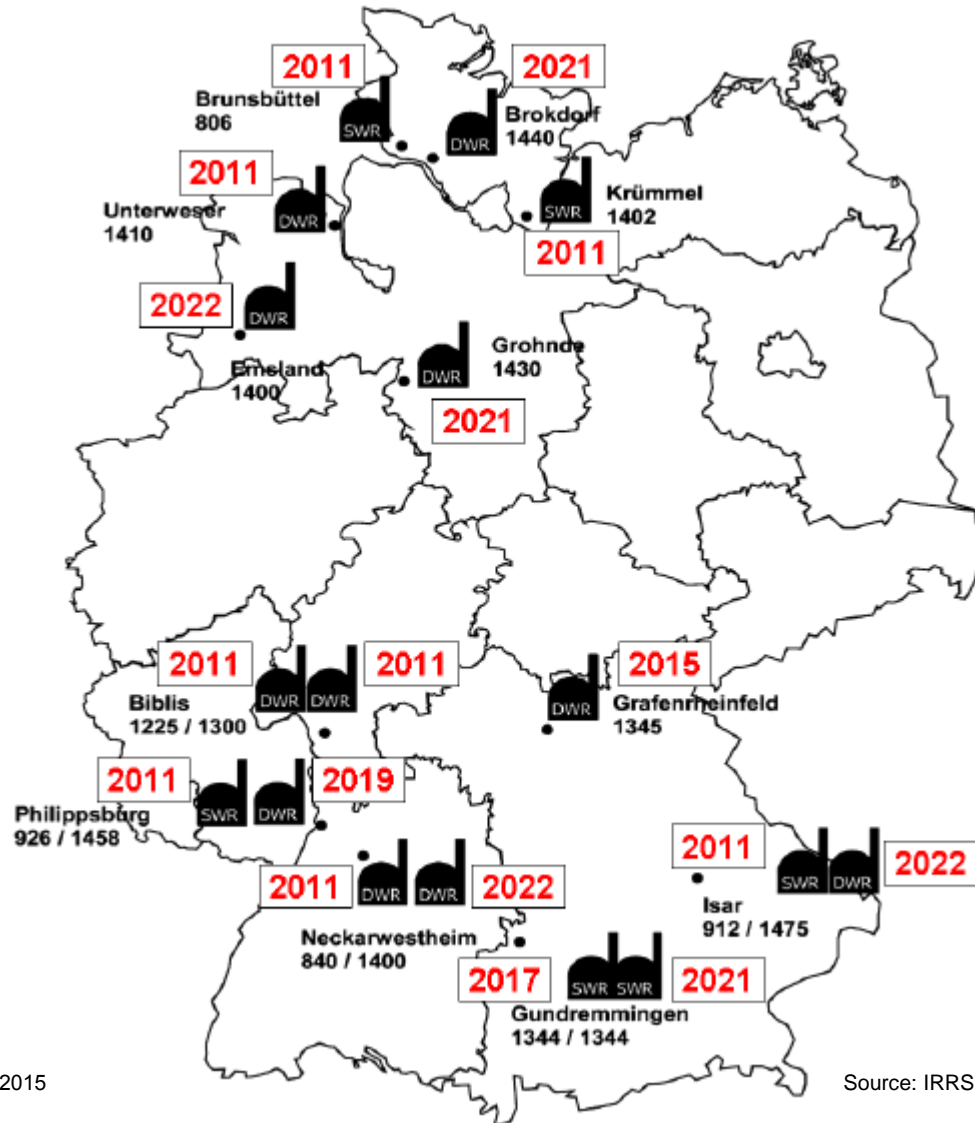
Numbers indicate gross capacity [MWe]



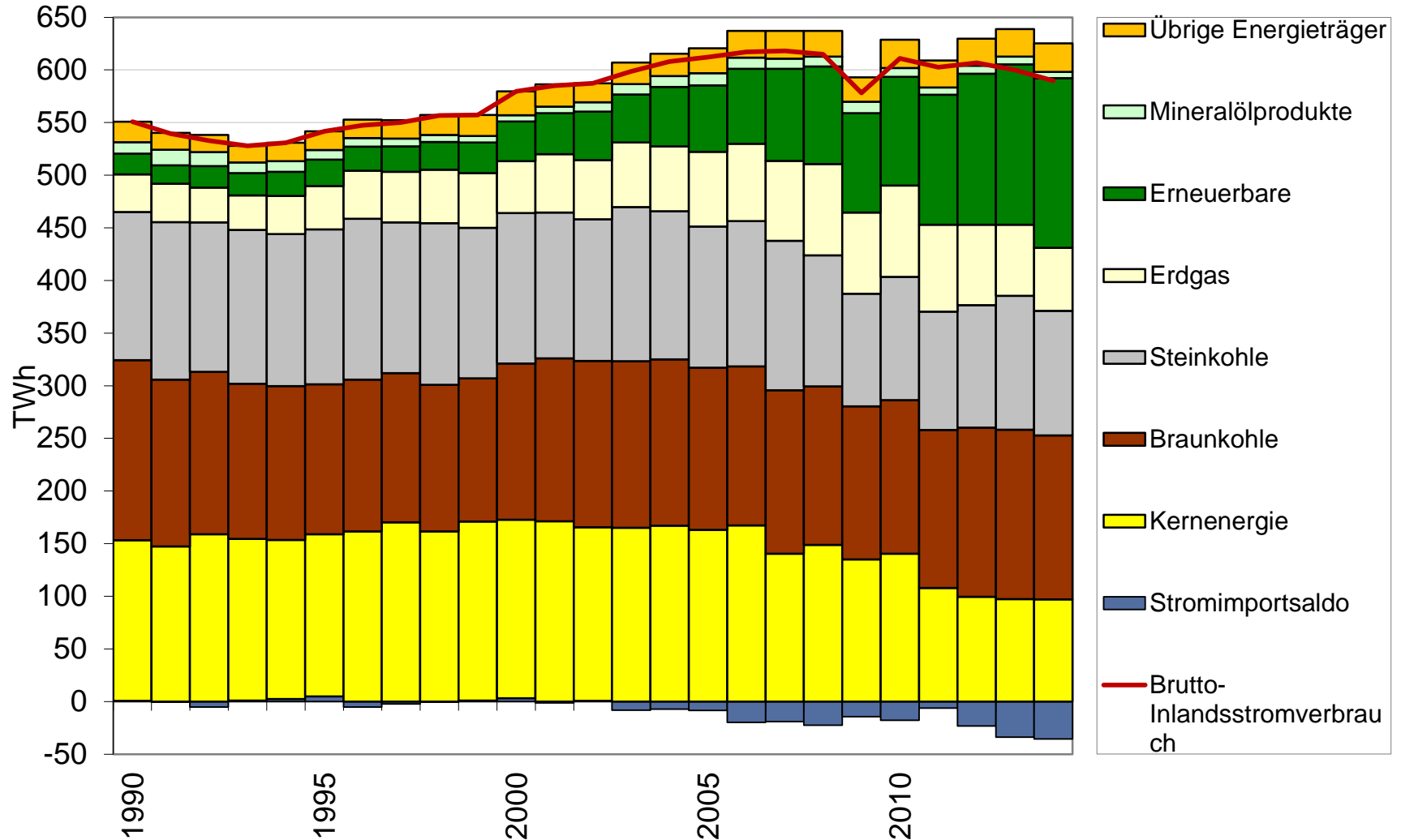
Nuclear Power debate in Germany

- 11.03.2011: Fukushima accident happens
- 15.03.2011: 3 month moratorium for seven oldest plants
- Change of the Atomic Law with broad consensus of all political parties
 - Electricity production limits reduced
 - Fixed shutdown dates for all plants, latest date 2022
 - 8 oldest plants remain shut-down

Shutdown dates according to Atomic Law



What Electricity Mix today?



Imports and Exports?

