



Federal Ministry
of Economics
and Technology

Energy

Meeting of Directors-General of the Ministries of Energy and of the national regulatory authorities of the EU Member States, CH and NOR, ACER and ENTSO-E

German presentation on outlook of changes in generation capacity by
2020/2030 after Fukushima

Brussels, 20 July 2011

www.bmwi.de



Outline

- „ Forthcoming phase-out of nuclear generation
- „ Energy package 2011
- „ Substitution of nuclear power
- „ Electricity generation in Germany by 2020/2030
- „ Further measures to come
- „ Conclusions



Forthcoming phase-out of nuclear generation (1)

- „ After Fukushima, reconsideration of role of NPPs
- „ Moratorium in March – June 2011: shutdown of 7+1 NPPs
- „ Decision by the German government in June 2011
 - „ Step-by-step process until 2022 to abandon the generation of energy by German nuclear power stations
 - „ Energy package to facilitate the transformation process (renewable energies as a cornerstone of future energy supply)



Forthcoming phase-out of nuclear generation (2)

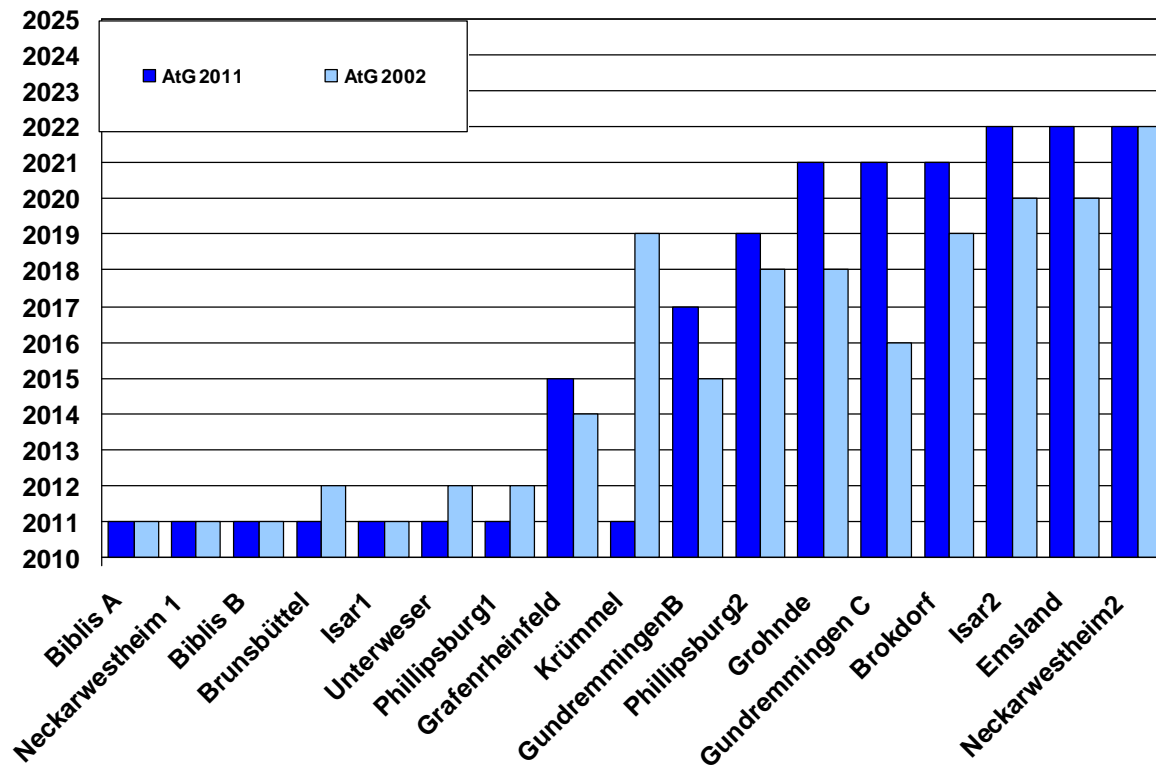
Nuclear power plant	Taken offline	Commercial operation started	Net capacity [MW]
Brunsbüttel	mid 2007	1977	771
Unterweser	under moratorium	1979	1345
Biblis A	under moratorium	1975	1167
Biblis B	end Feb. 2011, due to overhaul	1977	1240
Isar 1	under moratorium	1979	878
Neckarwestheim 1	under moratorium	1976	785
Philippsburg 1	under moratorium	1980	890
Krümmel	mid 2009	1984	1346
Total			8422
Total under moratorium			5065



Forthcoming phase-out of nuclear generation (3)

Nuclear power plant	Scheduled phaseout	Commercial operation started	Net capacity [MW]
Grafenrheinfeld	2015	1982	1275
Gundremmingen B	2017	1984	1284
Philippsburg 2	2019	1985	1392
Grohnde	2021	1985	1360
Gundremmingen C	2021	1985	1288
Brokdorf	2021	1986	1410
Isar 2	2022	1988	1410
Emsland	2022	1988	1329
Neckarwestheim 2	2022	1989	1310
Total			12058

Forthcoming phase-out of nuclear generation (4)





Energy Package 2011 (1)

- „ Energy Concept of 2010 remains long-term strategy
- „ Climate protection targets unchanged
 - „ Greenhouse gas emissions to be cut by 40 % by 2020 – for a reduction of at least 80 % by 2050, development plan as follows: 55 % reduction by 2030, 70 % by 2040 and 89-95 % by 2050
 - „ Target of 35 % electricity generated from renewables by 2020 – development plan is to increase gross electricity consumption by renewables to 50 % by 2030, 65 % by 2040 and 80 % by 2050
 - „ Other parts of the German long-term development path include efforts to cut electricity consumption by around 10 % by 2020 and 25 % by 2050
- „ More than 120 specific measures (in nine fields of action)



Energy Package 2011 (2)

- „ Legislative measures – 8 new laws or amendments to existing laws
 - „ Atomic Energy Act – phase-out of German NPPs
 - „ Act to Accelerate the Expansion of the Grid – including acceleration of spatial planning
 - „ Energy Industry Act – transposition of 3rd Internal Market Directive
 - „ Renewable Energies Act – cost-efficient expansion of renewables
 - „ Energy and Climate Fund Act – from 2013 all revenues from auctioning emission allowances will be a contribution to this fund
 - „ Energy efficiency – i.e. tax concessions for renovation of buildings; climate-friendly development of cities and municipalities; public procurement



Substitution of nuclear power (1)

- „ Nuclear energy accounts for approx. 23% of gross electricity generation (2010).
- „ Even after the phase-out, Germany will still aim to retain necessary capacities in order to cover all its electricity needs itself.
- „ Irrespective of this, Germany is located at the geographical heart of the EU's internal market, in which cross-border trade in electricity with the corresponding power flows is routine.



Substitution of nuclear power (2)

- „ In the medium term, the loss of nuclear’s share of electricity generation up to 2022 is to be offset by
 - „ new, efficient fossil-fuel power stations,
 - „ the expansion and ongoing market integration of renewables,
 - „ and not least an increase in energy efficiency.
- „ We expect the market to produce the following effects if we are to attain our climate protection goals on a cost-efficient basis:
 - „ In the short term an increase in production from existing fossil-fuel power plants.
 - „ From 2020, use of new gas-fired power plant capacity in particular.
 - „ From 2020, Germany could move from being a net exporter to a net importer on balance over the year.



Substitution of nuclear power (3)

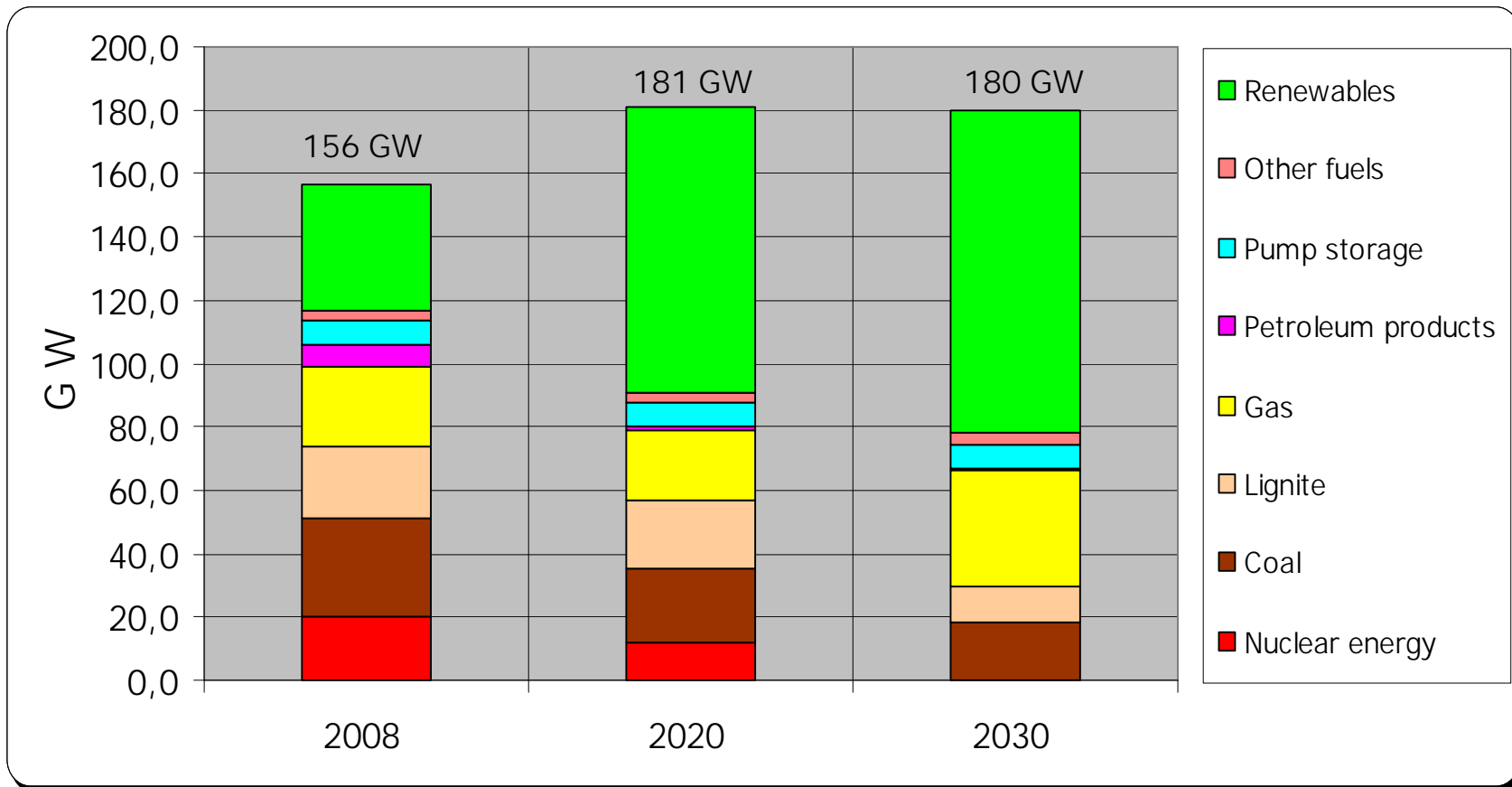
- „ That means that Germany needs to invest in fossil-fuel power plants.
 - „ As a substitute for the loss of the “guaranteed output” from nuclear, it is crucial to quickly complete [until 2013] the fossil-fuel power stations currently under construction (approx. 10 GW), not least for grid stability reasons.
 - „ Beyond that, we intend to have further construction of guaranteed power plant capacity of approx. another 10 GW by 2020.
 - „ Important: this does not contradict the planned expansion of renewables, because numerous older fossil-fuel power stations will also be removed from the grid in the period up to 2020.



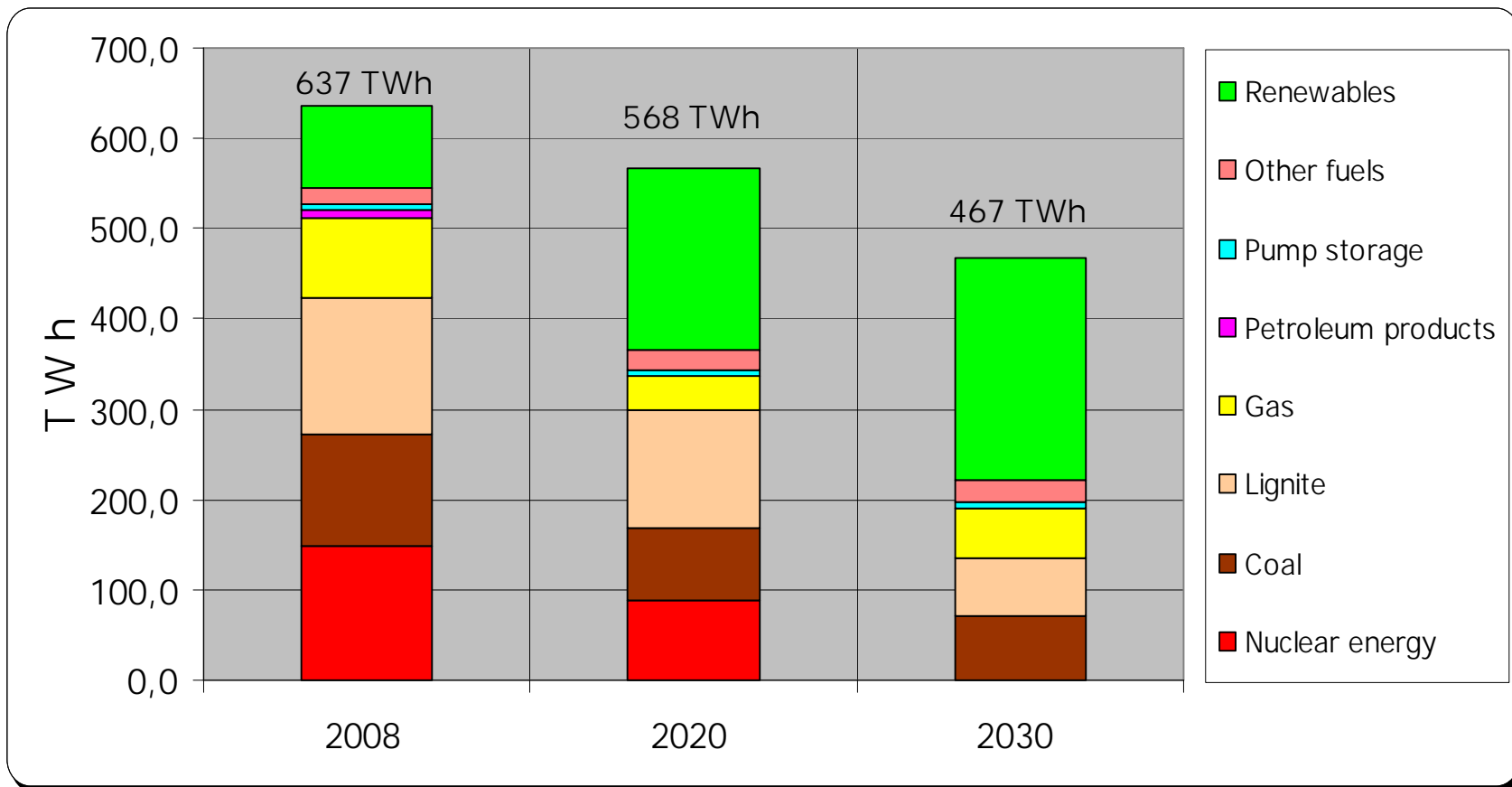
Substitution of nuclear power (4)

- „ There follow two charts sketching out the development of capacity and generation.
- „ These scenarios comply with the German government's energy and climate policy objectives. Scenarios are not forecasts. It may be that in 2020 or 2030 we have more gas-fired and somewhat less coal-fired generation than depicted.
- „ The general development is important, not the individual figure. And the direction is clear: an expansion of renewables and a reduction of consumption (and thus generation).
- „ Energy and climate policy objectives determine the following development:
 - „ Installed capacity will rise to 180 GW by 2020 (in particular a rise in the installed capacity of renewables).
 - „ Drop in consumption (-10 % by 2020 and -25 % by 2050) by energy efficiency and energy conservation.

Gross electricity generation capacity in Germany



Gross electricity generation by fuel type in Germany





Further measures to come (1)

- „ The Government is backing the provision of sufficient generation capacity.
- „ In a new “Power Plant Forum” in the Ministry of Economics (BMWi) we aim to improve the monitoring of generation in co-operation with the Länder and with industrial and environmental associations.
- „ Additional measures in the power plant sector will include:
 - „ Revision of the CHP Act – even more efficient use of feed-in tariffs with a view to the desired 25 % share of CHP in power generation (currently 15%)
 - „ Power plant programme – investment aid for construction of new highly-efficient CCS-ready power plants, following the opportunity provided for by the EU’s Energy and Climate Package
 - „ Planning acceleration act for power plants



Further measures to come (2)

- „ Further to this, we are also considering what the future electricity market will look like – the Ministry of Economics (BMWi) has commissioned a study into this.
- „ In particular, we wish to know whether additional conventional power plant capacity is needed to offset the fluctuating generation of electricity by wind and solar power.
- „ In this context, we are also investigating how any such capacity market can be fitted into the existing electricity market.
- „ Results of the study will be available in early 2012.



Conclusions (1)

- " The last months have made it very clear: the interconnected EU grid is the backbone of the single market.
- " That is why we are working towards the establishment and extension of a European grid.
- " While moving towards a predominantly renewable energy supply, we have to increase our efforts on maintaining a balance between supply and demand.
- " This is a core issue for safeguarding the security of the electricity supply.
- " Energy structures will have to be radically transformed if we are to achieve energy security, value for money, and the targets set by our climate protection policy.



Conclusions (2)

- „ Decisions regarding the energy mix are national decisions, but they can have implications on a European level.
- „ It should be considered how adequate generation capacities and security of supply in electricity can be addressed appropriately within the EU.
- „ Establishment of a new Electricity Coordination Group (similar to Gas Coordination Group)?
- „ Revision of EU directive on security of electricity supply (2005/89/EC)?



Federal Ministry
of Economics
and Technology

Thank you very much for your attention!



Federal Ministry
of Economics
and Technology

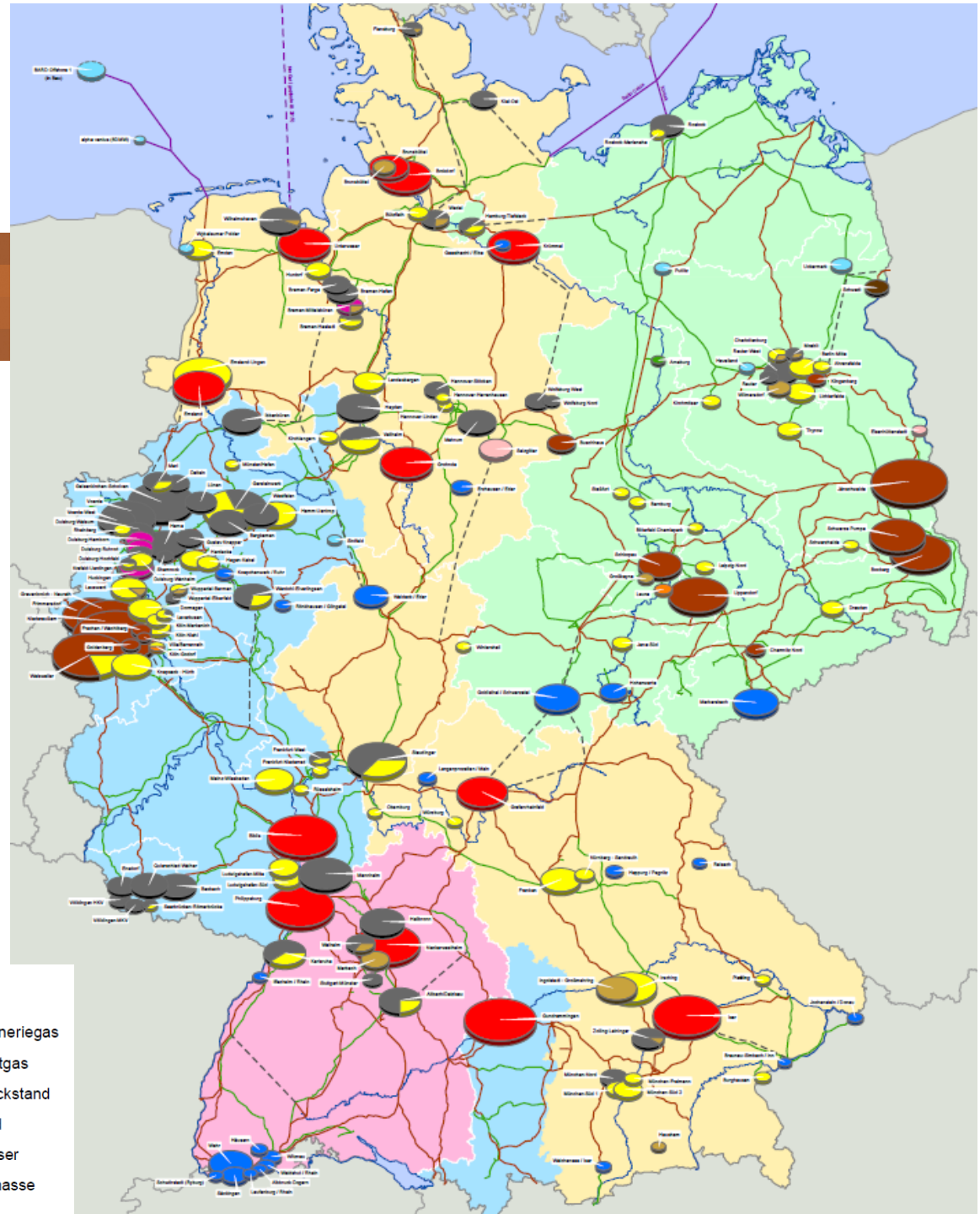
Backup

„ Power plants in Germany

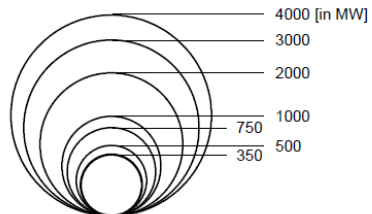


Federal Ministry
of Economics
and Technology

Power Plants in Germany



Kraftwerke ab 100 Megawatt



- | | |
|------------|---------------|
| Kernergie | Raffineriegas |
| Steinkohle | Gichtgas |
| Braunkohle | Ölrückstand |
| Erdgas | Wind |
| Heizöl | Wasser |
| Hüttengas | Biomasse |