

time to construct gas power plants than coal power plants. They provide flexible control which can be tailored to the needs of the market, because they can be switched off and on in 30 minutes, so they will work better with RES wind turbines (renewable energy). **Secondly**, emissions of carbon dioxide from gas power plants (approximately 600g CO₂/kWh) are lower than those from power plants fuelled by coal (about 1000g CO₂/kWh) or lignite (~1100g CO₂/kWh). This will be particularly important after 2013, when power plants will be required to purchase a larger amount of CO₂ emission allowances. Coal plants will be less competitive in this respect as long as CCS technology (CO₂ Capturing and Storing), which will reduce the cost of CO₂ emissions, is not deployed on an industrial scale. However, this will probably not be possible before 2020, as research on new technology

It will be necessary by 2022 to replace the country's nuclear power plants, which produce 23% of its electricity. It will largely be possible to meet that demand thanks to conventional power plants running on natural gas and coal.

is still ongoing. Besides, for environmental reasons, it is opposed by some of the German *Länder* (Lower Saxony, Schleswig-Holstein, Brandenburg), where there are the best conditions for its use. Most of the new natural gas power stations will be built in Germany's west (North Rhine-Westphalia, Lower Saxony), east (Brandenburg, Berlin) and Bavaria (see Appendix 1). This will allow them to replace the nuclear reactors,

and to reduce imports of nuclear power from France and the Czech Republic. Coal plants will be developed especially where coal mining predominates, such as the Ruhr, as well as in those regions most at risk of power failures after the nuclear reactors are decommissioned, that is, in Hesse and Schleswig-Holstein.

Few opportunities for German companies to invest in the market for conventional energy

The largest energy companies operating on the German market (RWE, E.ON and EnBW, Vattenfall) have 90% of the gas distribution market and 80% of the electricity market in Germany (see Appendix 2).

German companies are not interested in investing in conventional energy markets for the following reasons: uncertainty as to whether they can maintain their competitiveness in the long term; their large debts; their losses associated with the need to decommission nuclear reactors in Germany; and their unfavourable gas contracts with Gazprom.

Firstly, the German companies do not want to incur too high costs constructing and operating the new gas-fuelled plants because they do not know how long they will remain competitive. RWE was the first corporation to announce that it will not build new gas and coal plants on its own, and only those whose construction has already begun (a gas-fuelled plant of 7.2 GW and a 5 GW coal plant) will be completed. The German companies do not want to invest in conventional power plants because in the longer term, renewable energy will be the fastest growing segment of the energy market in most EU countries. RWE's management has let it be known that it will allot 70% of its investment to constructing renewable energy power plants and transmission networks, and not to conventional power sources¹.

Secondly, the biggest problem the German companies have is their debts, which have been growing for several years. This applies above all to the two largest German companies, E.ON (with €16 billion of debt) and RWE (€27 billion). To improve their financial situation and to avoid having their credit rating lowered, these companies are increasing their capital through the sale of assets. The corporations are mainly counting on selling their transmis-

¹ According to RWE's director of research and development, Frank-Detlef Drake, the RES sector is becoming increasingly profitable and less dependent on subsidies from the budget. By 2013, the company plans to have invested approximately €4 bn, mainly in offshore wind power, and in increasing its capacity for land-based wind power by exchanging its current installations for larger and more efficient models (so-called repowering).

sion and distribution networks, not just because of increased supervision of the transmission of gas within the EU², but mainly because of the networks' relatively low profitability³. This process has been ongoing for several years. E.ON, RWE and EnBW have already sold part of their transmission and distribution networks in Germany, Britain and the Netherlands. RWE has also announced the sale of its majority stake in its daughter company Amprion, which has the largest transportation network in Germany. The company wants to keep a 25% stake for itself and remain the largest shareholder for some time, so that it can maintain its influence on the development of the networks needed for the transmission

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of renewable energy⁴. E.ON, meanwhile, is planning to sell Germany's largest gas network, Eurogrid Europe (see Appendix 3).

Thirdly, the Federal government's decision to abandon nuclear power by 2022 could increase the debts of the four largest companies (RWE, E.ON, EnBW, Vattenfall) to a total of about €20 billion. The costs will be linked to the drop in sales of energy from nuclear reactors, the decommissioning and demolition of the stations, the transport and storage of radioactive waste, and the taxation of nuclear fuel.

It is possible that RWE and E.ON will get rid of their assets from the nuclear energy market in other countries, and they are also considering selling their joint company Npower in the UK. **Fourthly**, the companies will seek to minimise their losses on the gas market caused by their unfavourable long-term contracts with Gazprom and by the changing situation on the gas market. The price of gas in the contracts with Gazprom is dependent on the prices of oil; and so it increases as oil prices increase, as it has done significantly in recent times. Meanwhile the spot market price for gas in the EU has declined, because of oversupply associated with the economic crisis, as well as the decline in gas consumption⁵. Therefore, the price of gas in the contracts with Gazprom is higher than the spot market price, which means that the companies have been forced to sell gas at negative profits. The German companies' gas sales on the domestic market have declined, resulting in losses of about €1 billion each for RWE, E.ON and EnBW in the first half of 2011. Additionally, the drop in gas prices on the spot market has been indirectly affected by the rise in shale gas production in the US and a large supply of gas from LNG terminals in Europe.

Gazprom's activities on the German conventional energy market

Germany's conventional energy market is characterised by a diversity of supply sources. Although up to 56% of its gas is supplied from the EEA (European Economic Area), the largest supplier of natural gas (33%) remains Gazprom, the Russian monopoly (see

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Appendix 4). In 1990, the Russian company signed an agreement with the German Wintershall AG to distribute Russian gas in Germany. In 1993, both companies established a joint venture, Wingas AG (which currently has an 18% stake on the German gas market); currently Win-

tershall has a 50.02% stake in this venture, and Gazprom 49.98%. In 2005, Gazprom and Wintershall launched the Nord Stream project, together with another German company,

² Since March this year. EU countries have been obliged to implement the provisions of the Third Energy Package, which concerns the liberalisation and division of the markets for production, transmission and distribution. This means that a company cannot be an operator of a transmission network and a distributor of energy at the same time.

³ According to E.ON, its profits from the market for electricity transmission are low, and yield the lowest income for the business; this is why the companies are selling their transmission networks first.

⁴ RWE plans to sell 75% of the shares in Amprion for €1 billion.

⁵ The increased supply of gas is also associated with an increase in imports to LNG terminals in Europe.

E.ON Ruhrgas. In 2008 an agreement was signed to establish the South Stream consortium, in which Gazprom holds 50% of the shares; Wintershall will have a 15% share in the project. In 2009, Gazprom increased its stake in VNG, which also operates on the Polish market, to 10%.

Will Gazprom and Novatek be the German companies' partners?

Cooperation on the German conventional energy market is beneficial both for the German companies (E.ON, RWE, EnBW) and the Russian suppliers (Gazprom, Novatek). Gazprom and Novatek perceive an opportunity in this collaboration to increase their profits on the German gas market, which in the short and medium term should develop dynamically (production, transmission, distribution, electric power). Because of their increasing debt, the German companies are primarily seeking to reduce the costs of building new conventional power plants to replace nuclear power plants; to sell off their assets, including those on the gas market; and to renegotiate their long-term contracts in order to reduce the price of gas. This is especially true as it is not known whether the companies can convince the courts to come down on their side regarding their long-term contracts with Gazprom, as the Italian company ENI has succeeded in doing.

RWE is most strongly inclined to cooperate with Russian gas suppliers, mainly because the company has the biggest debt of all the German companies, and has lost a great deal from giving up nuclear energy. And so, after the change in the German energy strategy, it was the first company to sign (on 14 July this year) a memorandum on a strategic partnership with Gazprom to cooperate on the conventional energy market. In the medium term, the aim of this cooperation is to reduce the investment costs for new gas and coal power plants

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in Germany, Britain and the Benelux countries. For this purpose, RWE and Gazprom will probably decide to set up a joint venture. It is possible that the companies will also agree to include a 10% stake from RWE in this joint venture. Starting cooperation with RWE could also be a way for Gazprom to put pressure on another German company, E.ON – Gazprom's most

important partner on the German market, and perhaps even Europe as a whole. E.ON has called for lower gas prices, but it does not want to exchange assets, which Gazprom is interested in. The German press has also speculated about EnBW's possible cooperation with Novatek, the second-biggest gas producer (after Gazprom) in Russia. EnBW would sell Novatek up to 25% of its shares in the German company VNG, which EnBW controls via the EWE company. The remaining 23% of the shares, which EnBW controls via VNG, would be brought to the joint venture with Novatek by EnBW. In return, EnBW should get competitive prices for Russian gas. Next to E.ON Ruhrgas, RWE Energy and Wingas (split 50%-50% between BASF and Gazprom), VNG (in which Gazprom also has 10.5% of shares) is the largest gas importer in Germany, with a dominant position in the East German *Länder*. It also deals with the trade, transport and storage of gas in Germany and Poland, the Czech Republic and Slovakia, among other places⁶.

E.ON, the largest German company, is less interested in closer cooperation with the Russian companies, although like RWE and EnBW it also has unfavourable long-term contracts with Gazprom, has suffered the greatest losses from the abandonment of nuclear energy, and has its own large debts. However, it has more capital and assets than RWE and EnBW in Europe, and so it is less exposed to the risk of insolvency. E.ON has thus ruled out selling

⁶ German-Russian intergovernmental consultations – content dominated by form?, Justyna Gotkowska, Ceweekly, OSW, 27 July 2011.

its shares to Gazprom, or entering a strategic partnership with Gazprom (E.ON recently sold its stake in Gazprom, which had been its largest foreign shareholder), but in the future it may possibly create a joint project with the Russian monopolist. E.ON would be interested in cooperation in the field of gas extraction, and the construction of offshore wind farms.

Vattenfall will be the only concern which does not cooperate with Russian corporations, because it has lost little from the abandonment of nuclear power, and does not import gas from Russia.

Starting cooperation with RWE could also be a way for Gazprom to put pressure on another German company, E.ON – Gazprom's most important partner on the German market, and perhaps even Europe as a whole.

During a visit by Russian President Dmitri Medvedev to Germany, Chancellor Angela Merkel spoke critically about the possibility of both her country's imports of Russian gas and Russian companies' shares in the German market increasing; she also

rejected the option of building a third section of the Nord Stream gas pipeline. Also, some Russian energy experts have suggested that Germany does not intend to significantly increase its gas imports from Russia.

The consequences for Germany, the region and the European Union

The German market

1. The need to replace nuclear power and other sources of conventional energy, including gas, may lead to increased gas imports to Germany, as well as an increasing share for this commodity in the energy balance of German corporations; this will include enhancing cooperation with Russian blue fuel suppliers.
2. From Germany's perspective, increasing Gazprom's share on the German market should improve the security of Russian gas supplies, because the company will be interested in supplying its own raw material to the German market. This is particularly important for the gas-fired power plants which replace the nuclear ones.
3. The German government's critical stance towards the increase of Russian companies' shares on the German gas market, and its promise not to increase gas imports from Russia, could be a game of appearances, calculated to obtain the most favourable conditions for supply from Russia. It seems that since abandoning nuclear energy, the German government has been forced to bet on natural gas power plants, which emit less CO₂ than coal plants do. The possibility of diversifying the sources by increasing imports of gas from Norwegian fields, the increase in biogas production, and the creation of an LNG terminal in Rotterdam will all serve as bargaining chips in negotiations on the price of Russian gas.
4. It seems likely that the joint venture between Gazprom and RWE will come about. It will be responsible for constructing new gas power plants and operating the old coal power plants in Germany. The joint venture could include about 10% of RWE's shares. In return, RWE will be the first German company to obtain lower gas prices in its long-term contracts with Gazprom, which will increase its profitability on the conventional energy market. However, it seems less likely that a joint venture between EnBW and Novatek will be created, or that the Russian company will take a 25% stake in the VNG company which belongs to EnBW.

Markets in Central and Eastern Europe

1. From the perspective of the countries of Central Europe, a possible increase in Gazprom's stake in the German and western European gas sector will have significant consequences in the short term. In taking over part of RWE's shares, Gazprom would also undoubtedly influence its decisions, and gain access to strategic information on the gas and electricity markets in Central and Eastern Europe, including the Polish market (through RWE Poland).
2. In the case of acquisition of EnBW shares, the shareholder structure of Novatek would include part of the VNG company (Gazprom already has a 10% stake in VNG), which is present on the Polish market. The Russian company would acquire shares on the Polish market, including in G.EN Gaz Energia S.A., which is the leading private gas distributor in Poland; as well as in the NYSAGAZ company, which was jointly founded in 2000 by the Polish Oil and Gas Company and VNG.
3. Due to its involvement in the Nabucco project, which poses a challenge to Russia's strategic interests, RWE will probably not fundamentally change its strategy, but will continue to seek to diversify its sources of gas supply, as well as any opportunity to obtain a lower price for gas from Gazprom. The Russian monopoly's aim will be to put pressure on RWE to give up its participation in the Nabucco project.

The European Union market

1. Gazprom's new strategy seems to be to increase its participation on European markets in the electricity sector, a move which is aimed at circumventing EU regulations on increased supervision of gas transmission in the EU.
2. Because Germany has the largest gas storage units in Europe, an increase in imports of raw materials would strengthen its position as the guarantor of gas supplies in the European Union.
3. A joint venture between RWE and Gazprom, whose aim is to build new coal- and gas-fired power plants in the Benelux countries and Great Britain, may justify an increase in demand for gas from the second section of the Nord Stream gas pipeline, as well as the construction of branches leading to Western Europe.
4. To consolidate their assets, the joint venture between RWE and Gazprom may be combined with Npower, the UK subsidiary of RWE and E.ON. This would mean Gazprom's entry onto the UK's coal and gas market.

APPENDICES

1. Network of gas pipelines and new gas-fuelled power plants in Germany

Gas pipelines

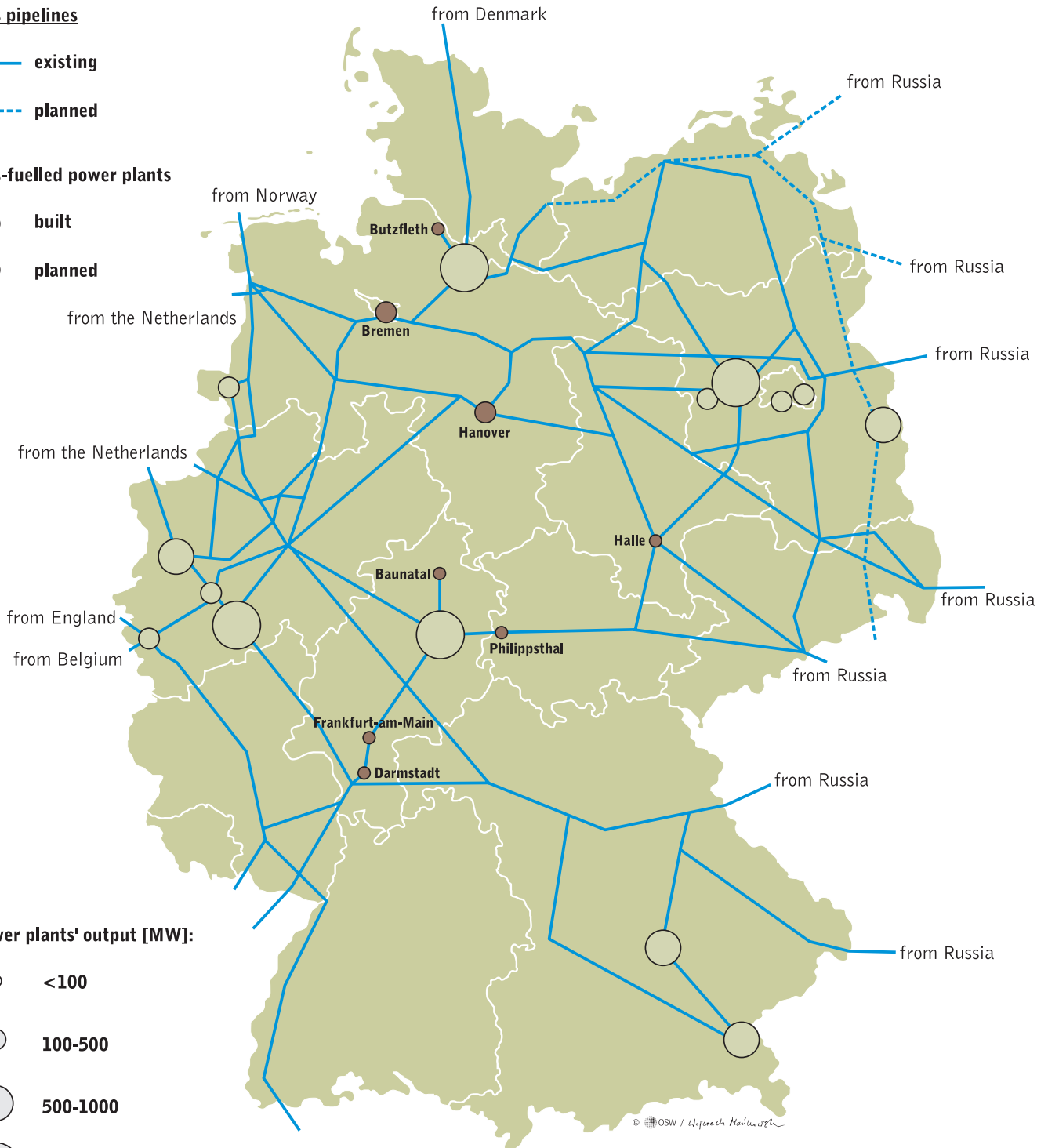
- existing
- - - planned

Gas-fuelled power plants

- built
- planned

Power plants' output [MW]:

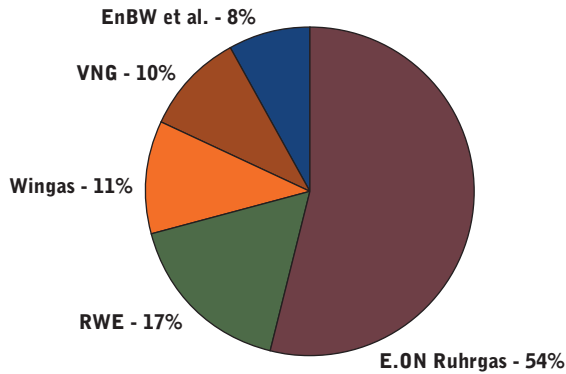
- <100
- 100-500
- 500-1000
- >1000



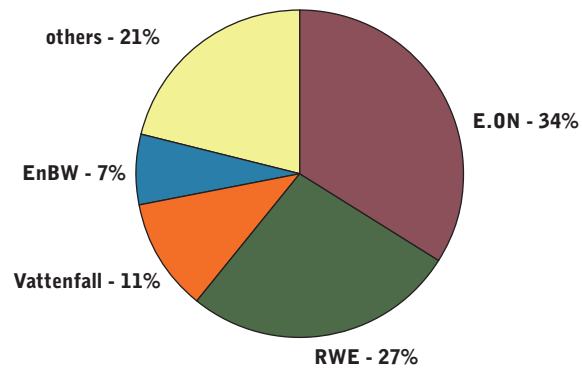
Source: German Ministry of the Economy, German Association of Energy and Water Industries (BDEW)

2. German companies' shares in the gas and electric energy markets

German companies' shares in gas imports to Germany (2010)



German companies' shares in electric energy generation in Germany



Source: Association of Energy and Power Industrialists

3. Companies for sale belonging to German companies

Company	Power networks in Germany	Power networks abroad	Other companies in Germany	Other companies abroad
RWE	Amprion (largest power network)	RWE Net4gas, RWE Dea	Suewag Frankfurt, VSE Saarbruecken, Elektrizitaetswerke Koblenz	Npower
E.ON	Opengrid Europe (largest gas network)			Npower
EnBW			25% of shares in VNG	

Table based on data from German Association of Energy and Water Industries (BDEW)

4. Countries supplying gas to Germany, 2010

Supply source	Share on supply market
1. Russia	33%
2. Norway	29%
3. Netherlands	22%
4. Germany	11%
5. Denmark/Great Britain	5%

Table based on data from German Association of Energy and Water Industries (BDEW)



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