



# Ruhr Area sticks to black power

Photo: Gert van Wijland

| by Gert van Wijland

Some may consider it environmentally unfriendly and technologically outdated to extract and burn brown coal, but German energy company RWE Power begs to differ. Actually, the company is proud of current innovations in the extraction of brown coal.

In North Rhine-Westphalia, the

of RWE Power at a recent press visit.

RWE has announced that it will have the first industrial-scale power station with carbon capture and storage on stream in 2014. The costs of this megaproject will be some €2 billion. Initially, Bauguitte speaks of the


RWE, however, genuinely believes in the new technology. 'We will definitely succeed in achieving our climate goals whilst continuing to use brown coal. A few years from now brown coal will be the only energy carrier we can extract in Germany. We are closing down our own black coal mines and the nuclear power plants are being decommissioned as well, which leaves us with open-pit mining if we want to avoid being too heavily dependent on import', says Bauguitte.

Naturally, RWE is also focusing on developing renewable energy sources, says Bauguitte. 'But nobody can force us to use financially inefficient generating technologies. We are looking for a combination that will secure efficient generation whilst protecting the climate to the best of our ability.'

*'In 2050 the outdated power stations will be a huge millstone around our necks'*

brown coal sector is looked upon as high-tech and essential to the country's energy supply. With the necessary investments in efficiency and carbon capture and storage (CCS), the climate will benefit from brown coal-fired electricity as well, said spokesman André Bauguitte

construction of a 'CO<sub>2</sub>-free power station', but quickly corrects himself, remarking tongue-in-cheek that 'Greenpeace says I am not allowed to say that. They say that the technology must prove itself first. In any case they would rather see the entire coal sector disposed of.'



Despite heavy opposition from environmentalists and scientists, brown coal continues to be the backbone of Germany's energy supply. This will not change for some time to come, says German energy group RWE. 'Environmental obstacles are surmountable.'

Brown coal's total share in Germany's energy supply will remain at around 40%, predicts Bauguitte. Besides the 'CO<sub>2</sub>-free -uh, low-CO<sub>2</sub>' power station several 'ordinary' coal-fired power stations (both brown coal and black coal) are on the drawing table. Bauguitte is unable to say just how many will be built; that depends on price movements and political decision-making. 'We are talking about brown coal and black coal stations. We are closing the black coal mines but will continue to import coal for a number of power stations.'

### Environmental gain |

In any case, the construction of two new units on the grounds of RWE's present brown coal power station near Neurath in the Ruhr region is on schedule. The five units at this location situated near the Dutch border

already generate more than 2,200 MW, supplying 15% of the region's energy. The two new towers combined will supply an additional 2,200 MW. 'The two power plant units will have an efficiency of over 43%', says RWE. The most striking components are the two buildings for the steam generators (boilers), which will look much like the Niederaussem unit, and the two cooling towers, which will be some 173 m high.

Before the new units are put into operation, RWE will disconnect five old 150 MW power stations from the network. That will immediately provide significant environmental gains, says the company. 'The efficiency of the old power stations is 31% as opposed to 43% to 46% of the new ones.' Bauguitte works out that 'by disconnecting the five old power stations we will save 6

million tons of CO<sub>2</sub> emissions'.

The spokesman thus touches on a controversial argument to defend the construction of the new power stations. 'Of course you will save a lot of CO<sub>2</sub> emissions by disconnecting outdated power stations, but why not replace them with clean and renewable sources, even by cleaner gas-fired power stations, if necessary? At least you will be doing something about greenhouse gas emissions,' says Dr. Stefan Lechtenböhme, Co-Director Research Group Future Energy and Mobility Structures of the renowned Wuppertal Institute for Climate, Environment, Energy.

He refers to a report published earlier this year by the German government (Lead Study 2008), 'which shows that the use of renewable energy can boom in

our country and that we need that boom to achieve the climate goals.'

One of the report's conclusions is that the contribution of renewables could grow to almost 180 TWh per year or 30% of the electricity consumption in 2020 and 50% in 2030. In 2007 Germany had 35 GW of renewable generating capacity, by 2020 that may well have reached 70 GW and by 2030 100 GW. 'Renewable generating capacity newly installed since 2000 produces more electricity in each year than the quantity lost due to the phase-out of nuclear power up to the respective year,' the report says.

At the same time the researchers note that the use of coal must continue to be restricted to reach these goals. 'Under the precondition that 28 GW



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of existing fossil generating capacity is decommissioned between 2005 and 2020, new fossil-fired power plants with a total capacity of 29 GW can be installed according to the lead scenario. Of that capacity, coal-fired power plants should not exceed 9 GW, the remaining 20 GW to be operated with natural gas, if the CO<sub>2</sub> reduction of 36% that follows from the Lead Scenario 2008 is not to be jeopardised.'

Although nobody knows exactly how many new coal-fired power stations are planned, the German energy producers have assumedly already exceeded the capacity of 9 GW. The scenario certainly leaves no room for the construction of more coal-fired power stations, says Andree Böhling, energy expert at Greenpeace. He says the study contrasts sharply with Germany's actual climate policy. 'The report recommends the use of natural gas, but the minister is sticking to the construction of additional coal-fired power stations, even though pit coal is the most climate unfriendly fossil fuel of all.'

The Wuppertal Institute supports this conclusion. 'Existing older lignite-fired power plants have efficiencies of between 33% and 36% and CO<sub>2</sub> emissions of well above 900 grams per kWh of electricity produced. The carbonless power plant with CCS will come up with 200 grams per kWh. That may seem like a tremendous reduction, but emissions are still greater than those of gas-fired power stations with CCS,' says Lechtenböhme. 'And if efficiency drops excessively due to the capture installation, emissions may well exceed those of gas-fired power stations without CCS.'

#### Use up coal |

No matter how promising the CCS technology may be according to RWE, there is one big disadvantage that has not yet been overcome: the capture of CO<sub>2</sub> requires so much energy that the efficiency gain of the newer power stations may well be lost, says Lechtenböhme. He receives support for this reasoning from Rudolph Blum, head of development of Danish energy group Dong, who says the short-term CCS results are

not very promising. Dong is one of the leading developers of the technology and is running the largest pilot project in the world with European aid. The energy balance for making a coal-fired power station climate neutral may well turn out to be a negative one and before you know it coal consumption will increase by 50%, Blum recently stated in the German press. His statements are confirmed by a spokesperson for Dong. 'The

reduced in time. Our worry is just that the option may be too expensive. Much depends on the price we must pay as from 2010 for the CO<sub>2</sub> rights.'

Although Lechtenböhme would much rather see that the large energy companies opt for a more sustainable path, he understands RWE's position. 'The coal is just lying there waiting to be mined, the diggers are already paid for, there is fuel in abundance and

*'Nobody can force us to use financially inefficient generating technologies'*

amount of energy required for washing is simply too much.' Results of the pilot installation in Denmark show that washing one ton of CO<sub>2</sub> out of flue gas requires 3.7 gigajoules of energy. That alone eliminates one third of the saving.

RWE spokesman Bauguitte does not agree. 'There are so many technological developments going on that the energy consumption will surely be

it is cheap. I think I would use it up too. It is up to the politicians to solve the dilemma between energy security and climate protection. They have decided not to exclude the use of brown coal.'

Lechtenböhme points out the problem that will arise in the long term. 'By 2050 we are required have saved 80% CO<sub>2</sub> and then the outdated power stations will be a huge millstone around our necks.' ■