

INTERNATIONAL CONFERENCE: TRENDS AND PROSPECTS OF COAL PRODUCTION AND USAGE IN UKRAINE AND GLOBALLY

InterContinental Hotel, Kyiv
14 June 2017

Global trends of coal production and consumption: winds of change

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This paper summarises a presentation given at an international conference hosted by DTEK on the trends and prospects for coal production and use in Ukraine and globally on 14 June 2017 in Kyiv.

Introduction

Coal provides over 40% of the world's electricity and, with 1.2 billion people still without access to this life-blood of a modern civilisation, coal use will grow alongside growing electricity use. According to the International Energy Agency, even with the tough climate policies that governments around the world are now considering, coal use will grow by perhaps 0.2% per year to give a 4% increase in consumption by 2040.

In the European Union (EU), one quarter of electricity comes from coal. Yet, in Brussels, one might imagine that the end of coal was nigh. However, to misquote Mark Twain, "Reports of coal's death are greatly exaggerated".

In the Netherlands, three large, new coal-fired power plants were commissioned in 2015 and coal imports grew to 14.5 million tonnes in 2016. There are new coal-fired power plants in Germany, Italy, Slovenia, Poland, the Czech Republic, Greece, Bulgaria and Bosnia Herzegovina. New coal-fired power plants are planned in Romania, Montenegro and Croatia.

Those new plants, and the thousands of existing coal-fired power plants, all need coal. In 2016, the EU produced 87 million tonnes of hard coal and 371 million tonnes of lignite or brown coal. To meet demand, an additional 167 million tonnes of coal were imported – with Russian coal taking the largest share.

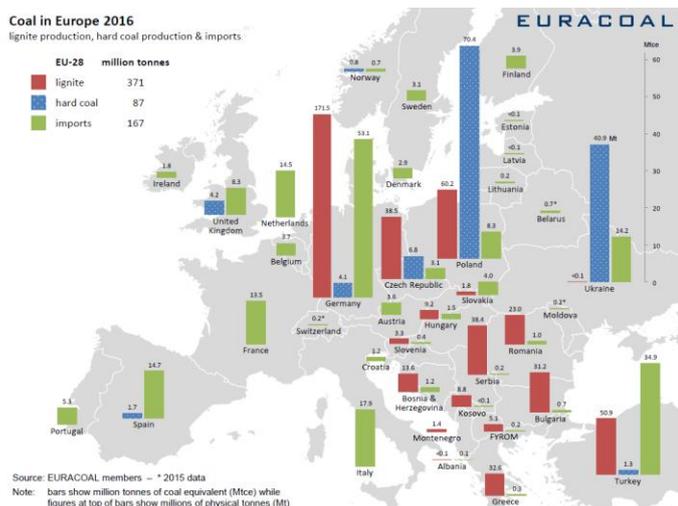
Global trends and winds of change

A pessimism developed towards coal in October 2014 when the EU agreed to tough new climate targets – a 40% reduction in greenhouse gas emissions by 2030. EU energy policy is now driven by these targets; they have become the absolute imperative, taking priority over economic cost, energy security and environmental sustainability. It is now more acceptable to burn wood chips shipped to Europe from forests in North America than it is to burn European coal.

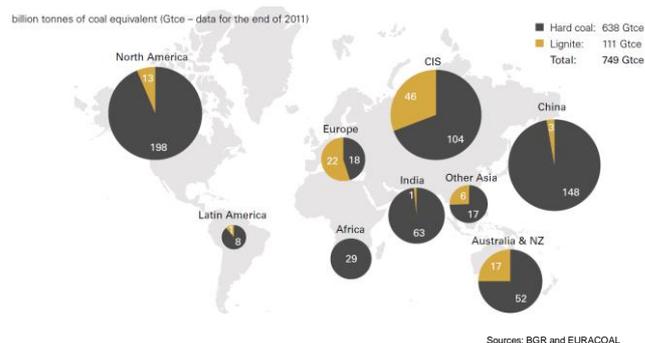
Nevertheless, the market for coal in Europe over the last few years has been good, although, since the economic crisis that began in 2008, prices have been lower than many producers would have liked. It was therefore encouraging that coal prices recovered in 2016 to reach 95 US\$/tonne at ports in northwest Europe. However, the reasons for that price recovery are worth exploring as it was not market driven.

To raise prices – in support of its mining industry – the Chinese government limited coal supply by placing working-time restrictions on all coal mines: miners could only work for 276 days. As a result, China had to import more coal – in total, 240 million tonnes – overtaking India to again become the world's No.1 importer in 2016. India imported 217 million tonnes, followed by Japan with 191 million tonnes.

International coal prices duly increased. In fact, the Chinese government wants a coal price of 70-85 US\$/tonne. Unlike OPEC which relies on co-operation between its many members to set oil prices, China alone has the power to set coal prices. The coal market is at the mercy of Chinese government policy. Paradoxically, a price of 70-85 US\$/tonne is a price that suits many producers and leaves coal-fired power generation competitive in the crucial European market.



Global hard coal & lignite reserves



88% of the EU's conventional energy reserves are in the form of coal and lignite (and 95% of our resources).

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Around the world, coal is the most abundant source of energy, the most affordable and the most accessible: 88% of the EU's conventional energy reserves are in the form of coal and lignite.

China is by far the largest coal producer, mining 3 500 million tonnes or almost half of total global production – eight times what is consumed in the EU. The United States is the second largest producer (803 Mt in 2016), followed by India (639 Mt) and Australia (440 Mt).

International seaborne coal trade, 2016 (million tonnes)



Estimated total global hard coal production in 2016: 6.7 billion tonnes

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Over one billion tonnes of coal is traded and shipped around the world each year. The above chart shows international coal trade in 2016.

The future of lignite mining in Germany



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Germany is the world's biggest lignite producer, mining 172 million tonnes in 2016. In 2015, to the astonishment of industry, the German government tested public reaction to a phase-out of lignite mining. The Vice Chancellor, Sigmar Gabriel, proposed an additional tax on older lignite power plants.

After strong lobbying by industry and the trade unions, the result was not a tax, but a subsidy for older lignite plants. These would be kept for a few years in a 2.7 GW “national strategic reserve”, before closing.

More recently, the Environment Minister, Barbara Hendricks, has spoken of the need to agree a phase-out plan for lignite, like Germany has already agreed for hard coal, and for nuclear power plants after the terrible events at Fukushima in Japan. She tabled a report in June 2015 in which seven professors call for a “long-term coal consensus” to promote trust in the *Energiewende* or “energy transition”.

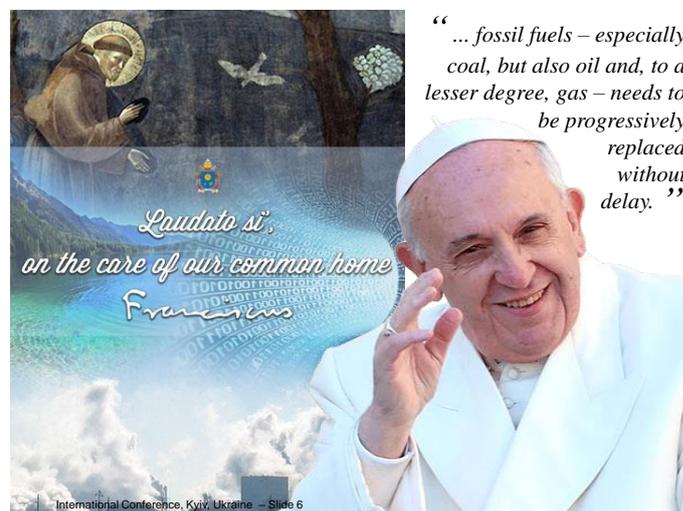
Why is there now a discussion about a phase out of lignite mining in Germany? It is the latest victory for the “green” movement. Past successes have included the nuclear phase-out, the banning of shale gas exploitation in some countries and, of course, the UNFCCC Paris Agreement of December 2015 which aims to control the temperature of the planet.



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There are many people who believe in extreme climate change. They live in fear and make others fear that we are somehow destroying our planet. In Europe, politicians respond with ever-tougher climate targets that already, today, cost the economy tens, maybe hundreds of billions of euros every year.

The “green” movement wants a revolution. They want to allocate capital, not according to free market principles, but according to their own “green” ideology.



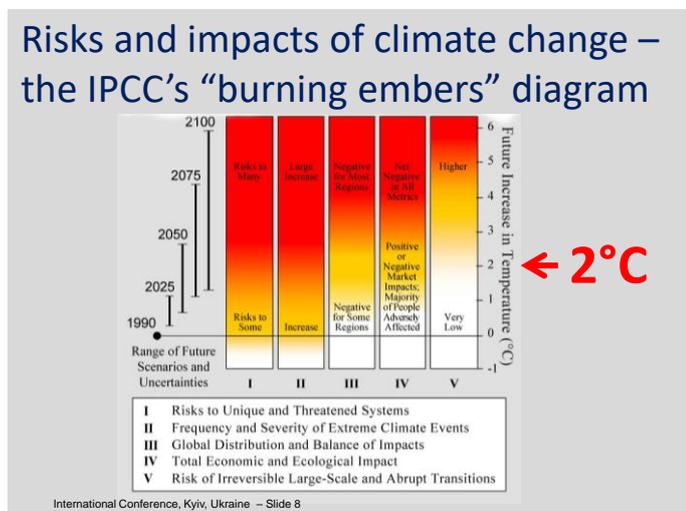
International Conference, Kyiv, Ukraine – Slide 6

Perhaps the biggest support for that ideology came from the Pope in his 2015 encyclical “*Laudato Si*” on the care of our common home, published before the UNFCCC climate conference in Paris. His Holiness writes of a sick planet, wracked by environmental damage caused by man’s irresponsible use and abuse of natural resources and modern technologies. He proposes that fossil fuels be progressively replaced, preferring natural gas over coal as the lesser of two evils during an “energy transition” to renewables.

A most interesting point about the encyclical is not *what* it says, but *who* influenced it. The Pope did not give a PowerPoint presentation in the Vatican when it was launched, but Prof. Hans Joachim Schellnhuber presented his version of what he calls the “Great Transformation”.



Prof. Schellnhuber is a member of the Vatican Academy that advises the Pope. He is also director of the Potsdam Institute for Climate Impact Research in Germany. For many years, he has been a trusted scientific advisor to Chancellor Merkel. He presents humanity as a problem that causes the planet to suffer; he thus embraces the Gaia Theory which treats the world as a living being.



Schellnhuber shifted the debate from the problem of “global warming” to one of “climate tipping points” with runaway, catastrophic impacts. In 1995, he put forward

the 2°C limit for global warming. Even he admits that there is no scientific basis for this limit – it is just his educated guess. The 2°C limit was adopted by the German government in a statement at the first UNFCCC Conference of the Parties in Berlin, chaired by Angela Merkel in 1995 when she was Environment Minister.

Prof. Schellnhuber alone is not responsible for our current climate policy which has evolved over many years.

Almost six decades ago, in 1957 and 1958, scientists from around the world participated in the International Geophysical Year (IGY). Some scientists had a notion that man-made CO₂ emission might disrupt the natural balance of CO₂ in the atmosphere. Bells Laboratories in the US made a TV series that warned of climate change if we continued to burn fossil fuels and emit CO₂. At that time, the US nuclear industry needed a positive story in support of civilian nuclear power. They were the first of many vested interests in the climate debate, well before there was any detailed computer models of the Earth’s climate.

Moving forward to this decade, the new President of the United States campaigned with the slogan “Trump Digs Coal”. His new administration is, “committed to clean coal technology and to reviving America’s coal industry”. There is certainly a lot that can be done, but one should remember that US coal production peaked at over one billion tonnes ten years ago. Today, production is 25% lower because of competition from competitive shale gas.

Here in Europe, the *Energy Union* proposal was made by Donald Tusk in April 2014 when he was still Prime Minister of Poland. He is now President of the European Council. Tusk’s six-point proposal to ensure Europe’s future energy security was sensible and well-balanced. In an opinion piece in the Financial Times, published on 22 April 2014, he wrote, “Europe should make full use of the fossil fuels available, including coal”. Coal was part of his vision for an Energy Union.

The Energy Union communication from the Commission, launched towards the end of 2015, takes an altogether different direction. The underlying imperative is not energy security, but climate action and a move away from fossil fuels. The future use of coal is incompatible with the EU's decarbonisation agenda, according to Vice President Šefčovič, responsible for Energy Union, and Commissioner for Climate Action and Energy, Mr. Arias Cañete in a letter to EURACOAL. In contrast, gas imported from Russia, central Asia and the Middle East is seen as desirable.



The coal industry has to work with today's political vision. Clean coal with CCS is what the European Commission wants from industry: with CCS, coal would have fewer problems. This means offering CCS as a solution, even though the technology is not universally supported. Poland has identified an area of the Baltic Sea for CO₂ storage that is very distant from its coal-fired power plants in Silesia. In Germany, the government blames public opinion which is against any new infrastructure. In the UK, E.ON cancelled a new coal-fired power plant with CCS when the government failed to give its political support.

Carbon capture and storage



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It seems that CCS alone is not enough. The coal industry must offer something more. One option is to use less coal over the coming decades, in balance with a growing

share of renewables. The industry needs to appear to be disappearing over the next twenty or thirty years. Agreeing this as a high-level political principle would allow coal mining to continue within the agreed EU carbon cap and soften the rhetoric against coal.

CCS is not enough.

*We have to have a narrative that fits with today's **political vision**.*

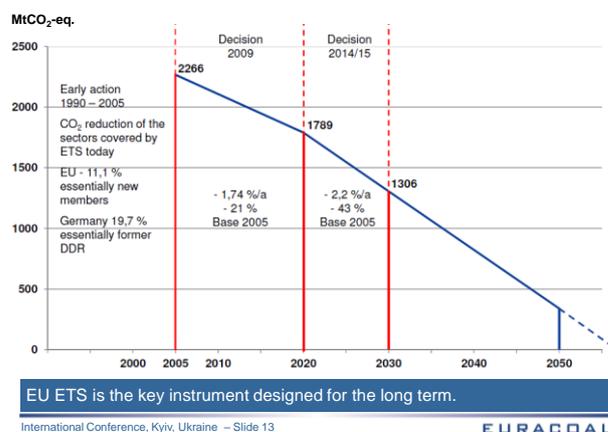
*We need to appear to be disappearing, while gaining some respect for the role of coal during the **“energy transition”**.*

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The practicalities of reaching such an agreement are significant. When energy policy decisions appear difficult, the European Commission points to the Treaty obligations that mean each member state is free to decide on its own energy mix and on how it exploits its own energy resources – Article 194 of the Lisbon Treaty that EURACOAL welcomed.

Whilst it is true that coal use in member states might not be the responsibility of the European Commission, the Commission has it within its power to eliminate coal use in the member states, using its powers on environmental matters under Article 191 of the Lisbon Treaty. This leaves the coal industry fighting skirmishes on new pollution control regulations (e.g. ETS, IED, LCP BREF and others), without a positive picture from the top on coal's role in securing energy supply in the EU.

EU Emission Trading Scheme = zero CO₂ in 2058



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Implementation of Energy Union begins with the 2030 framework for EU climate and energy policy. This sets the toughest climate targets in the world which are now enshrined in the Paris Agreement.

What is proposed, and essentially now agreed by member states, means that carbon emissions from the sectors covered by the EU Emissions Trading System – so emissions from all coal- and lignite-fired plants, from all gas-fired plants, from fertiliser plants and from most of industry – must fall to zero by 2058.

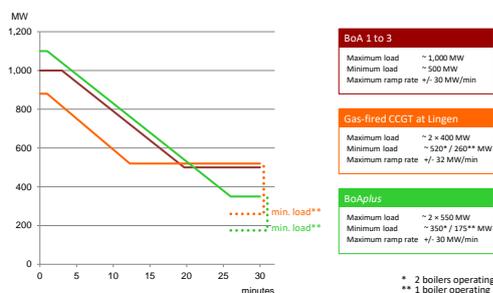
A tough climate target in the EU is a bonanza for gas. To achieve the proposed 40% target for 2030 means change and there are only a few possibilities: new renewables, nuclear and CO₂ capture and storage. However, none of these will be driven by emissions trading as they all need direct subsidy.

The first change to be driven by emissions trading is fuel switching from coal to gas. EURACOAL has estimate that this will happen at a carbon price of €55/tCO₂, but the exact figure depends heavily on the price of gas. Fuel switching to gas will mean that wealth flows out of the EU to gas suppliers in Norway and Russia. Overall, electricity consumers in Europe would have to pay an extra €100 billion each year. That is why Statoil is the biggest energy industry lobbyist in Brussels and Gazprom works quietly behind the scenes.

Renewables are heavily promoted as an alternative to fossil fuels. Indeed, an enormous investment has been made in new renewables, with an impressive growth in capacity since the year 2000 of mainly wind and solar: 71 GW of solar photovoltaics (PV) and over 100 GW of wind turbines. Unfortunately, the growth in the actual output of useful electricity has been rather less spectacular.

What is happening in Europe is the construction of a second energy system. EU member states continue to depend on the existing system when the wind does not blow or the sun does not shine. Investing in renewables should not be seen as an alternative to conventional generation: Europe needs both, but can Europe afford both?

Flexibility is needed to balance renewables



Coal-fired power plants match the flexibility of gas-fired power plants.

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Some argue that flexible gas plants are needed to balance intermittent renewables. Flexible plants are certainly needed, but modern coal-fired plants are just as flexible

as gas-fired plants. The ramp rates for new coal and gas plants are remarkably similar, but existing coal plants are cheaper to run than new gas plants.

Conclusion

In conclusion, if coal remains competitive and if government policy values security, then there is every chance that coal will survive as a strong component in Europe's future energy mix. All the coal industry needs to do is to stay calm, act professionally and ensure that coal is mined and used as efficiently and cleanly as possible.

The modernisation of existing power plants and the construction of new state-of-the-art power plants – like in the Netherlands – would reduce local air pollution and protect the climate with immediate emission reductions of one third or more in the case of CO₂.

New coal-fired power plants in the Netherlands

- Engie (GDF Suez, Electrabel) Maasvlakte (Rotterdam) 800 MW
- Uniper (Eon) Maasvlakte 3 (Rotterdam) 1116 MW
- RWE Eemshaven (Groningen) 1560 MW



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At the UNFCCC meeting in Paris in December 2015, politicians agreed to prepare five-year plans for the energy sectors of almost every nation on Earth. In the EU, we are about to embark on the preparation of twenty-eight national energy and climate plans. Over the coming years, politicians will be able to reflect on the outcome of these plans: with accelerating technological progress, the world in 2050 will be very different from today.

Today, at the EU level, we have a climate and energy policy that assumes a further shift to imported natural gas. This policy leaves us strategically vulnerable. A cleaner more prosperous future is a good thing and reducing pollution is part of achieving that objective. The coal industry wants pragmatic policies that encourage investment to modernise our energy infrastructure and make it fit for the 21st century – valuing all energy sources. Coal and lignite are not forbidden fruits; they are resources to be used wisely for the benefit of all.

