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DIE ENERGIEWENDE



**LichtBlick**  
Generation reine Energie

# COAL: A DEAD END

Why there is no future in coal

## Imprint

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- Fig. p. 19: <https://beyond-coal.eu/de/zahlen-und-fakten/>

# The energy transition has been successfully launched: what is missing is the withdrawal from coal

# Coal has only one perspective

When it comes to coal, there is a clear perspective. Or rather, none. Because coal does not have a future. It is one of the single biggest sources of carbon emissions, a powerful driving force of global warming, destroying the basis of our existence. For the sake of our planet but also for our own sake, we must therefore stop burning it.

Germany plays a key role in the global phase-out of coal. As an industrial country that still heavily relies on this outdated fossil fuel, it can show the world how a transition towards 100 percent renewable energies can successfully work. It can once again become the role model that it once was, when it proclaimed the Energiewende in the first place. But now it actually has to act on it.

This change should happen not only because of climate protection policy - even though that would be reason enough. The change should also stem from the wish to establish a thriving, resilient economy. Because what is oftentimes ignored or worse is the fact that replacing coal with clean energy is also an economic necessity. Wind and solar are already cheaper than fossil fuels. And already many more people are working in the renewable industry than the coal industry.

A number of countries have realised that and are now shifting away from coal, the UK, the Netherlands and a number of US states being a few of them. Other countries have to follow, if they want to move forward ecologically, economically and socially. Taking Germany as an example, this is what the report will explore.



**Gero Lücking**

Managing Director Energy, LichtBlick SE



**Michael Schäfer**

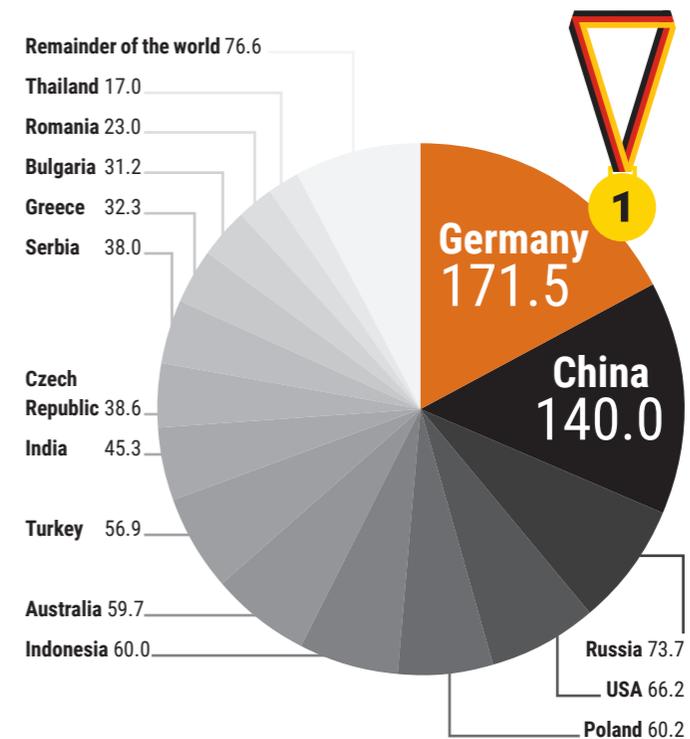
Director Climate and Energy, WWF Germany

# Germany is world champion – in lignite mining

Doubts about the energy transition have been nurtured for decades. An energy supply without coal or nuclear power? Only something for dreamers and anarchists, according to the sceptics. Even in the 1990s, the German energy industry was still claiming that sun, wind and water would never contribute more than four per cent towards meeting demands in the long term. Now every child knows better.

A complete withdrawal from nuclear energy is imminent and the launch of renewable energies long since achieved. In all probability renewables will contribute not four but around forty per cent to the national power supply this year or next. According to their coalition agreement, the current German Federal Government wants to boost the proportion of green energy to 65 per cent by 2030, i.e. within twelve years. However, the key ingredient is missing for a convincing beginning to a long-term sustainable energy future: success with climate protection. Because although the proportion of climate-friendly renewable resources in power consumption is increasing, Germany's overall greenhouse gas emissions have not decreased for a decade and those of the energy sector have only done so by

tiny steps. The large-scale use of coal for electricity generation continues as before. This results in overproduction of energy and pushes up Germany's CO<sub>2</sub> balance. If we do not succeed in making an immediate and serious start to phasing out coal-fired power now, then not only will we miss the German climate goal for 2020 but also the target for 2030 which, according to the coalition contract from March 2018, the German Federal Government wishes to reach "without fail". It is time that the sceptics finally looked at the facts.

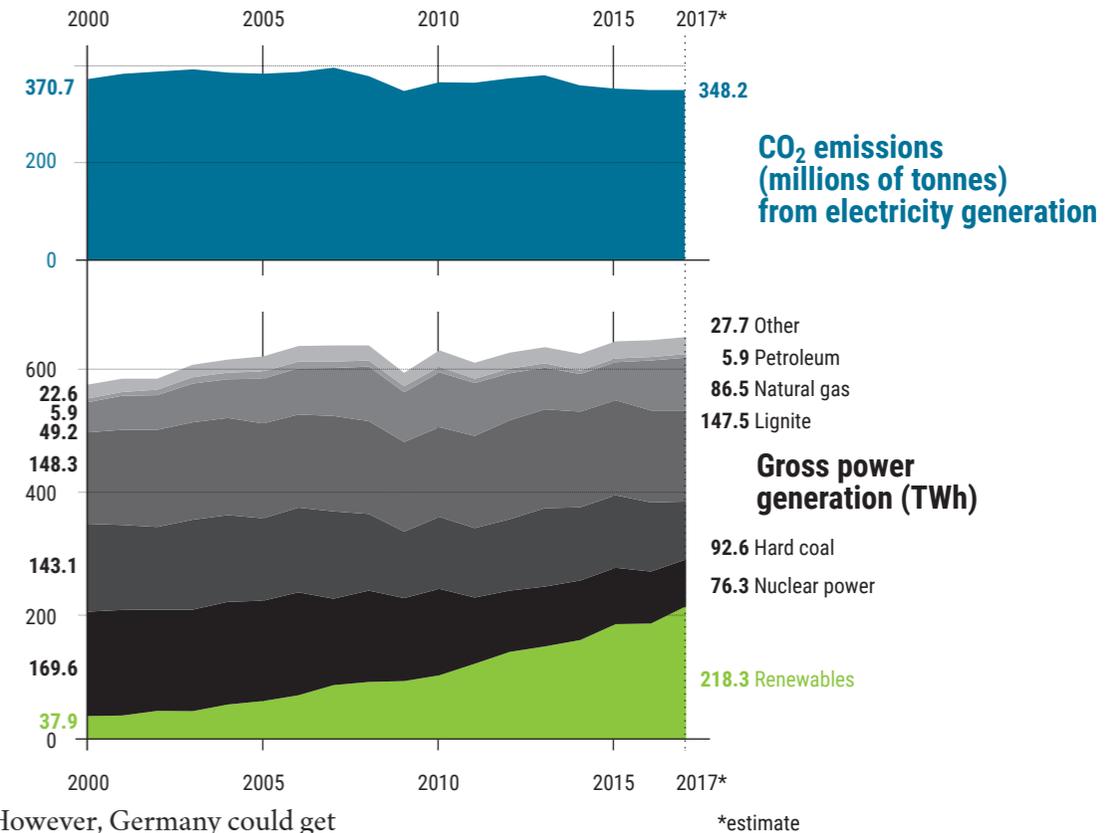


Germany is world champion – in lignite mining Global amounts of lignite mined in 2016 by country (in million tonnes)

# No energy transition without phasing out coal

Germany cannot become the energy transition country and remain the coal country. Coal-fired power plants still contribute almost 40 per cent to Germany's gross energy consumption, an energy output comparable to all the renewable energies put together. The contribution from coal combustion to the CO<sub>2</sub>-emitting power sector is double what it contributes to electricity generation, i.e. almost 80 per cent. In Germany the brown coal power stations alone emit as much CO<sub>2</sub> as the entire transport sector. These few facts are enough to show that climate protection will remain illusory in the energy industry without making cuts in coal-fired generation. To comply with the 2020 climate goal, Germany would need to save 150 million t CO<sub>2</sub> annually, the energy industry alone around two thirds of this (100 million t). This gets more and more unrealistic with every month of inactivity. However, Germany could get significantly closer to the 2020 target by rapidly shutting down a significant number of old coal-fired power stations which are not essential to the security of supply. It is true that withdrawing from coal would not be sufficient in isolation to comply with the climate change

objectives: there is an urgent need for all the other sectors as well. But without a withdrawal from coal, it will not work.



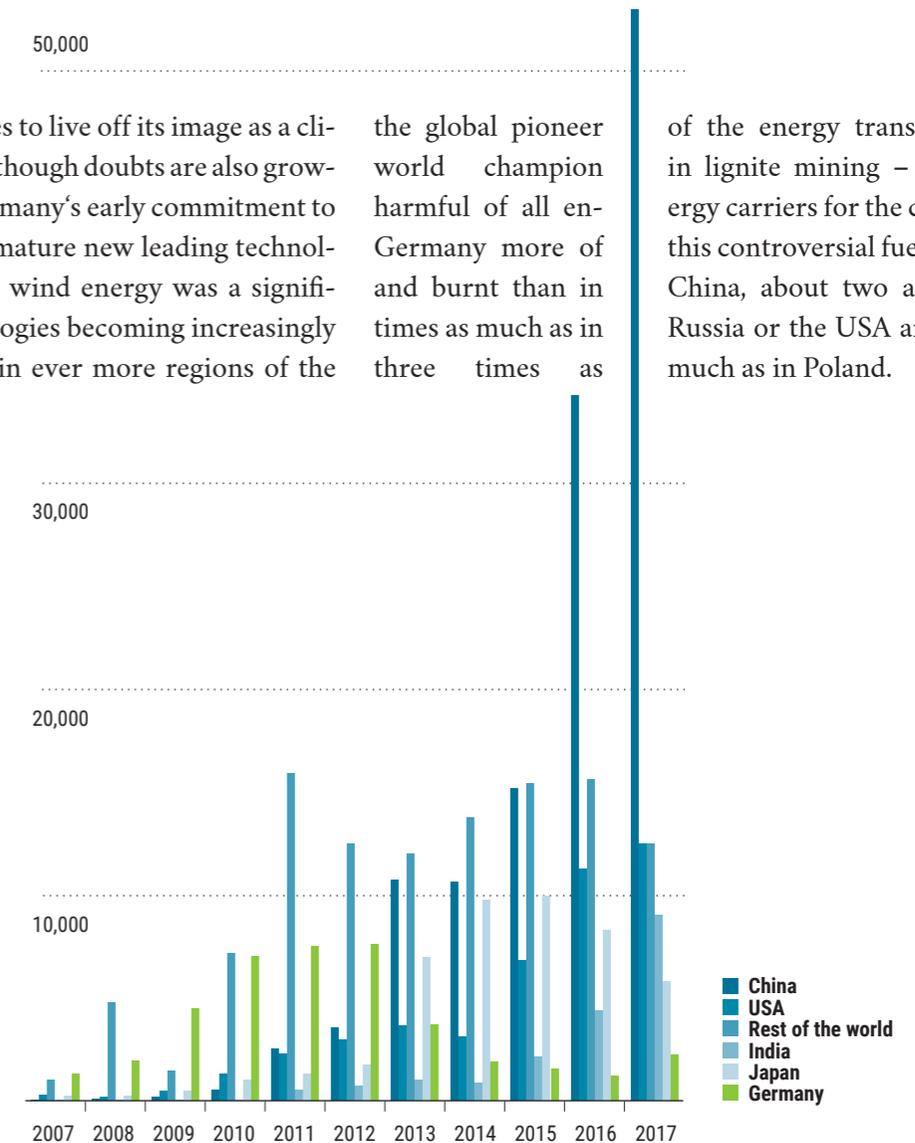
**CO<sub>2</sub> emissions have stalled despite the advance of renewables** Development of gross power generation (in TWh) and CO<sub>2</sub> emissions from electricity generation (in millions of tonnes) from 1990 to 2017

# A coal country cannot be the international pioneer of the energy transition

Abroad, Germany continues to live off its image as a climate protection pioneer, although doubts are also growing beyond its borders. Germany's early commitment to the then expensive and immature new leading technologies of photovoltaics and wind energy was a significant factor in these technologies becoming increasingly economically competitive in ever more regions of the world. In almost all the locations where a start is being made with the energy transition, keeping traditional forms of energy from coal-fired and nuclear power is more expensive than the route towards a sustainable energy system. The principal reason for the growing doubt about the seriousness of the energy transition in the boom land of Germany is its continued adherence to coal-fired generation. In a climate ranking published by the climate protection advocates of the Climate Action Network (CAN) in June 2018, Germany only made 8th place amongst the EU member states. The list is headed by Sweden, Portugal and France. The main minus point was that Germany will fail its 2020 climate protection target because the government continues to delay the necessary action. Germany is no longer

the global pioneer world champion harmful of all en-Germany more of and burnt than in times as much as in three times as

of the energy transition, but in lignite mining – the most ergy carriers for the climate. In this controversial fuel is mined China, about two and a half Russia or the USA and almost much as in Poland.

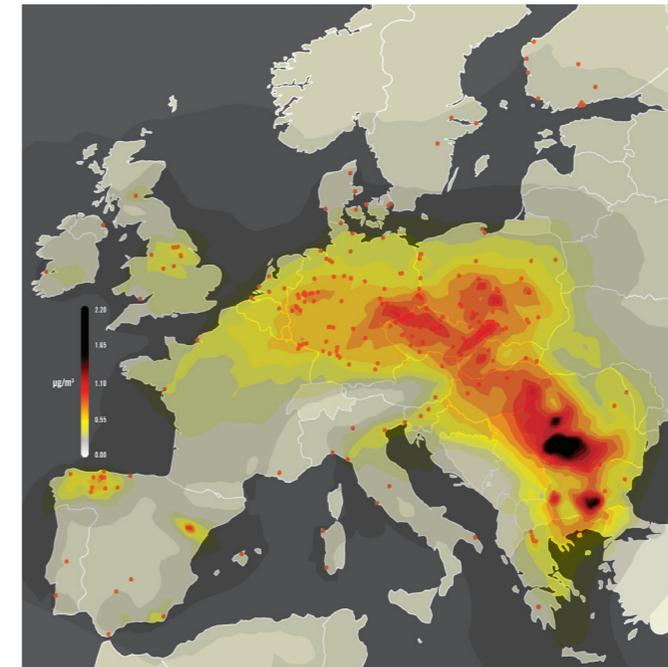


**The former market leader loses ground** New installation of photovoltaic capacity in megawatts from 2007 to 2017

# Coal is not cheap and endangers health

The power supply is always and everywhere systemically important. The political will of those in power is therefore a crucial factor for the energy alignment of a national economy. According to an analysis by the German Federal Environment Agency, energy from lignite, for example, is not actually cost-effective: but it is under government protection and is subsidised by the state. Electricity from coal would no longer be competitive if the secondary costs for the environment and society were adequately taken into account. Coal generation endangers health through air pollutants emitted by the power plants. Over 800,000 people worldwide die prematurely every year due to burning coal. According to recent studies, in Europe nearly 23,000 people die prematurely every year from the poisonous fumes from coal power stations, almost as many as from traffic accidents. What is more, the German Federal Environment Agency now anticipates environmental costs amounting to 120 euros for every tonne of CO<sub>2</sub> emitted to the atmosphere. This equates to annual burdens of 46 billion euros from coal-fired generation, based on 2016. Further increases are expected.

If we make an honest calculation which takes adequate account of what are known as the external secondary costs, then coal power is not cost-effective at all. This fact about lignite power generation has had further confirmation just recently in a study by Green Budget Germany (GBG) in Berlin. According to this study, withdrawing from German lignite generation would save climate and health costs plus state subsidies and benefits of 28 billion euros annually.



**PM 2.5 pollution from EU coal power plants in 2013 (average)**

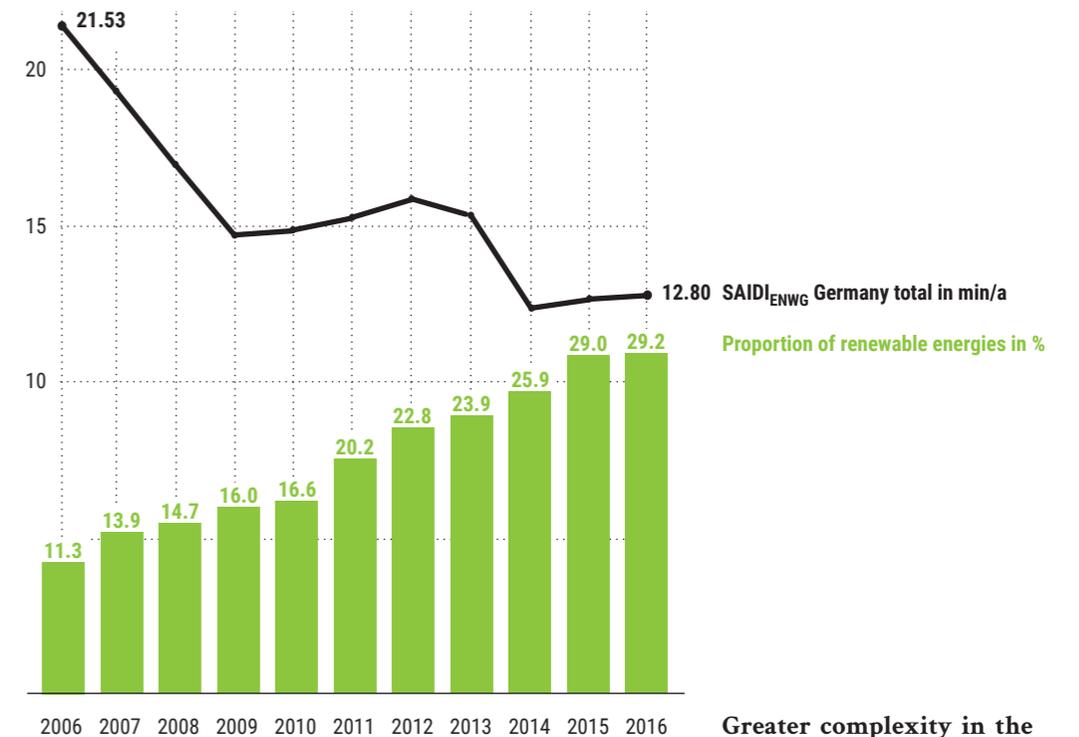
# There is less and less need for coal for a secure power supply

Germany will continue to operate its coal power plants for a few years and potentially need to keep them in reserve for a certain period after shutdown. This is beyond dispute. No environmentalist or climate activist is demanding an „immediate withdrawal“ from coal. But coal power generation can be phased out in the years ahead, without Germany having to forego a secure supply of electricity.

All the projections claiming that a system with increasing proportions of wind and solar energy would inevitably lead to increasing numbers of interruptions to the power supply and also trigger the big blackout have not proved true. On the contrary: the most important indicator for the security of the electricity supply has in fact steadily improved. The more power that solar and wind power plants have fed into the electricity grid, the lower was what is known as the SAIDI. This acronym stands for System Average Interruption Duration Index, i.e. the length of power cuts in minutes which an electricity consumer must put up with per year (see figure). The SAIDI has varied over the last few years between 12 and just under 13 minutes

and has fallen significantly since 2006. At that time the

value was still 21.5 minutes and the renewable energy share in gross power generation was just 11.3 per cent. By 2017 this had tripled to 33.3 per cent.



Greater complexity in the control of the energy system does not lead to a blackout

Trend in the SAIDI<sub>ENWG</sub> value\* (in min/a) and proportion of renewables in the power mix (in %) in Germany from 2008 to 2016

\*The SAIDI<sub>ENWG</sub> (System Average Interruption Duration Index) reflects the average supply interruption per connected end user per calendar year

# Structural change by phasing out coal can be socially acceptable

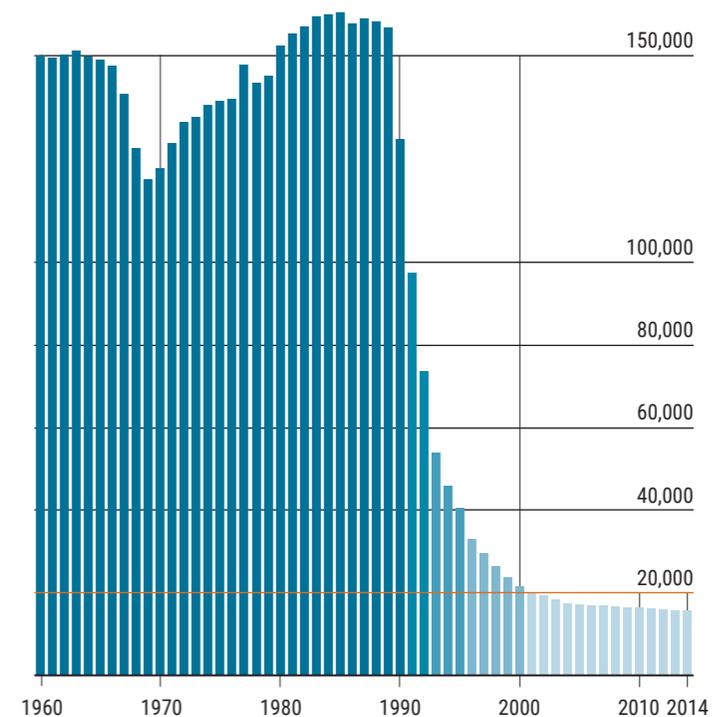
Structural change is the rule in social processes, not the exception. It is currently being discussed in Germany in connection with the anticipated upheavals in the automotive sector, for example, an industry which is faced with a similar structural change to the lignite industry, the difference being that it accounts for around twenty times the number of jobs. Many mines have been closed over the years. National-

ly, the number of people employed directly in the lignite industry in 2018 is well below 20,000 and thus, even in the affected federal states of Brandenburg, North Rhine-Westphalia, Saxony and Saxony-Anhalt, in the range of a tenth of a percent of all employees liable for national insurance contributions. There were still over 60,000 actively employed in coal mining in North Rhine-Westphalia and Saarland in 2000, when the last mine was closed. As it turned out,

no one was made redundant for operational reasons. In lignite mining the employee age structure also helps towards a socially acceptable phase-out. In a skilfully managed phase-out of coal, for example by 2035, around two thirds of the employees could retire normally. It is therefore unfair to claim renewed social structural

breaks as in the past. These can no longer happen, due to the lack of numbers for a start. A more major structural break would have to start with the cushioning of social hardships, as in the past, but could not stop there. Help would obviously be provided for establishing new factories and industries in the mining regions, in order to create jobs. But it is people who develop a region,

even more than industrial zones. This requires the basics of up-to-date infrastructures, such as fast Internet and connections to the national centres round about and in neighbouring countries. What is clear is that the transition to the energy system for the 21st century needs to go hand in hand with a structural change in the affected regions.

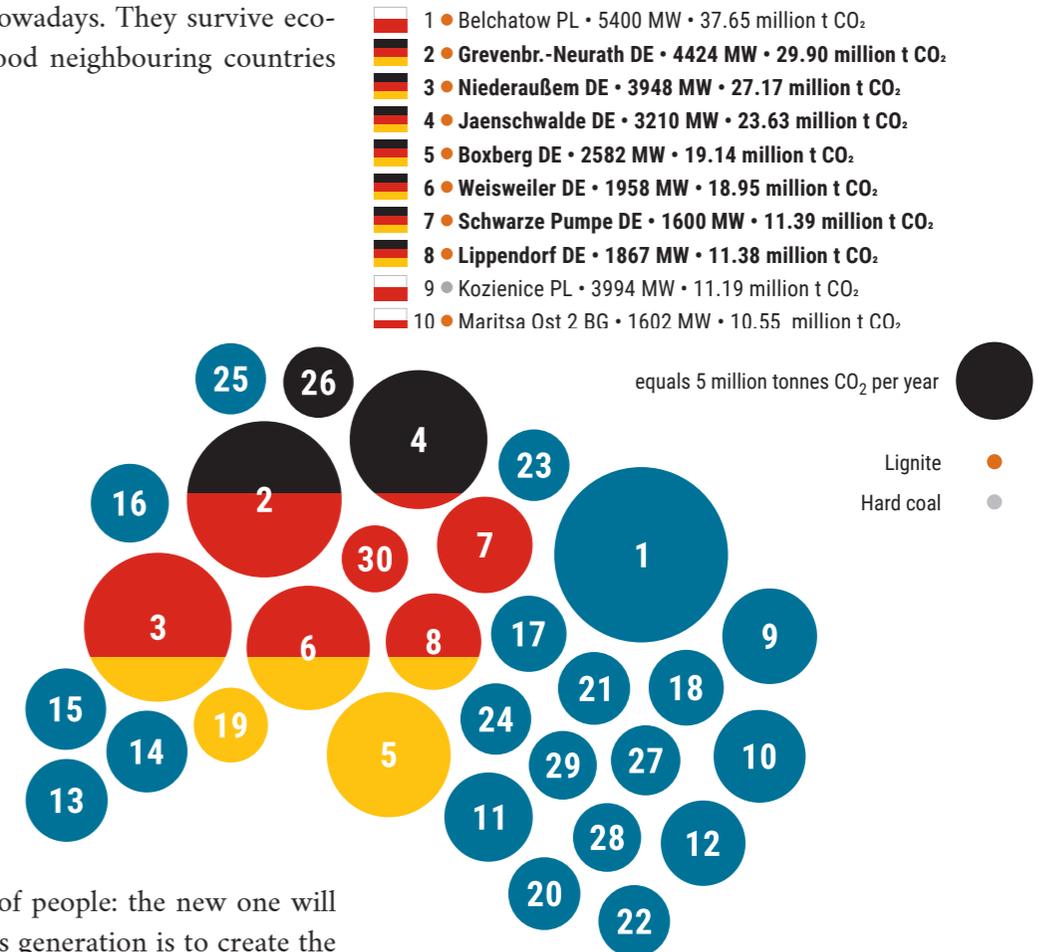


**The largest part of the structural change is already behind us** Trend in numbers of employees in lignite mining in Germany from 1960 to 2014

# Phasing out coal cannot be avoided

A large proportion of German coal-fired power plants are old, most have long since been written off. There are overwhelming reasons to start phasing out coal now. Renewable energies no longer make the energy system more expensive and the old coal-fired power plants are scarcely worth anything nowadays. They survive economically because they flood neighbouring countries with climate-polluting power. But this is just another phase which will come to an end sometime, because Europe and most of Germany's neighbours are also opting for the energy transition. When the secondary damage from the coal-fired power stations is included in the bill, if not before, it will become more expensive to hang onto the old system. The difference between this and continuing the energy transition lies in the consequences. The traditional energy system will make the earth uninhabitable for billions of people: the new one will preserve it. The role of this generation is to create the transition to overall sustainability. The new categorical imperative states that all key technologies for the 21st century – not only energy technologies – must fulfil the criterion of sustainability. This imperative results from

the number of people who will be living on this earth this century. The projected 10 billion people will not be able to meet their demands for a good life without complying with the sustainability requirement for key technologies.



The 30 dirtiest coal-fired power plants in Europe by CO<sub>2</sub> emissions in 2017 (in million tonnes)

LichtBlick and WWF are convinced that the rapid conversion from fossil-nuclear energies to renewables in the power, heat and mobility sectors is the key requirement for protecting the climate, establishing a low-risk energy system and increasing Germany's competitiveness in the decades ahead. We want to join forces and move the energy transition forward.

The phase-out of coal-fired power generation in Germany by 2035 at the latest is key to meeting the goals of the Paris Climate Agreement. This booklet is a summary of an extensive report by Dr. Gerd Rosenkranz on behalf of WWF and LichtBlick. Dr. Gerd Rosenkranz is a journalist and author who specialises in energy topics. The full report is available for download on our website.