
ANNUAL REPORT
2018

FACTS AND TRENDS 2017/18



Import Coal Market at a Glance

	2015	2016	2017 ¹⁾
World			
Hard Coal Production	7,018	6,813	6,996
World Hard Coal Trade	1,224	1,214	1,244
thereof hard coal seaborne trade	1,126	1,114	1,145
Hard Coal Domestic Trade	98	100	99
Hard Coal Coke Production	650	649	633
Hard Coal Coke World Trade	23	25	26
European Union (28)			
Hard Coal Production	100	89	78
Hard Coal Imports (incl. Domestic Trade)	192	169	174
Hard Coal Coke Imports	8	8	9
Germany			
Hard Coal Use	58.6	56.7	50.3
Hard Coal Volume	59.9	57.5	52.1
thereof import coal use	53.5	53.6	48.5
thereof domestic hard coal production	6.4	3.9	3.6
Imports of Hard Coal and Hard Coal Coke	57.5	57.2	51.4
thereof steam coal	43.2	42.9	36.2
thereof coking coal	12.3	12.3	12.9
thereof hard coal coke	2.0	2.0	2.3
Prices			
Steam Coal Marker Price CIF NWE	67	69	98
Border-crossing Price Steam Coal	68	67	92
CO2 emission rights (EEX-EUA settlement price)	7.68	5.35	5.83
Exchange rate (US\$ 1 = €...)	0.90	0.90	0.89
¹⁾ Some figures provisional			

AN INTRODUCTORY WORD

News of its death is premature. After two years of declining global hard coal production and declining world trade, the market has made a significant recovery. Anything else would also have been surprising. New power plants are under construction in many emerging and developing countries because their development models are based on hard coal. Their new demand compensates for the decline in consumption, which is occurring primarily in Europe.

World energy consumption has increased substantially faster than hard coal consumption; natural gas and oil have posted strong gains – as have the CO₂ emissions. The situation in Germany is virtually the same. In this country as well, consumption of natural gas and oil is on the rise because of increasing consumption in the transport sector and industry. In contrast to global development, however, consumption of hard coal in Germany is declining rapidly.

The use of hard coal for power generation in Germany fell dramatically in 2017 (-17 %). As of June 2018, it is apparent that a further decline of about 20 % is to be expected over the remainder of the year. This is in part due to the increased feed-in from renewable energy sources, especially wind energy, and in part to the subsidised use of natural gas CHP plants. In consequence, hard coal has for all practical purposes fulfilled its contribution to the CO₂ reduction targets set forth in the German government's Climate Protection Plan.

There is absolutely no reason to introduce any additional restrictive regulations for power generation using imported hard coal within the scope of the newly established commission "Growth, Structural Transformation and Employment." It would also be unreasonable to burden hard coal with an overproportional adaptation obligation, because hard coal-fired power plants are needed for the energy transition. They serve to secure load peaks and as backups for dark doldrums. And in contrast to open-cycle gas turbines, which have a lower degree of efficiency, hard coal-fired power plants are available right now. Moreover, practical experience indicates that the interest in investing in open-cycle gas turbines is currently equal to zero. At best, the sluggish expansion of power lines could force short-term investments in open-cycle gas turbines in specific regions once the nuclear power plants have been shut down.

When we think about it rationally, we see there is no alternative to imported hard coal. It is needed to secure low-priced energy supplies. In an open economy in which the German export surpluses have reached record highs, the supply of primary energy sources on the world market also contributes to a balance in trade with our partners.

Berlin, July 2018



Dr. Wolfgang Cieslik
– CEO –



Prof. Dr. Franz-Josef Wodopia
– Managing Director –

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* We have decided to save space and reduce expenses by not printing the glossary and the list of institutions. However, they are still available for viewing on the Coal Importer Association's website.

GERMANY

General Conditions of the Overall Economy

In the estimation of the German Council of Economic Experts, the upswing in Germany and the eurozone will continue. The Council expects growth rates of the real gross domestic product of 2.0 % in 2017 and 2.2 % in 2018.

Investments and exports were the pillars of the upswing in the past year 2017. Growth in expenditures for private consumption will slow slightly in 2017 as well as in 2018 while growth in expenditures for public consumption declined significantly in 2017 and will be only slightly above the level of the previous year in 2018. Growth in construction investments rose substantially in 2017, but will decline again in 2018. Equipment investments in 2018, in contrast, will grow by 5.1 %, almost double the rate of 2017. Growth in other plant investments has been constant at between 4 % and 5 % for several years. The number of working people and employees subject to social insurance obligations continues at a record level.

The spring assessment of the Council of Economic Experts bears the title: "German Economy Booming – the Air Is Getting Thinner". Utilisation of capacities in industry is 88 %, an above-average level. There is a shortage of specialist employees in many regions. The Council of Economic Experts sees indications that the upswing is coming to an end. But it is not yet necessary to speak of overheating. Clemens Fuest, president of the Ifo, explained circumstances to the Handelsblatt of 12–14 January 2018 in this way: "Wages have not risen any faster than productivity, and the inflation rate is low."

The extremely loose monetary policy of the European Central Bank (ECB) is regarded as an important reason for the strong economy. The "Wise Men of the Economy" advocate a quick end to the loose ECB monetary policies: "In view of the good economic situation in the eurozone and the recent rise in the inflation rate, the initiation of the ECB's exit from the expansive monetary policies is overdue." The ongoing low-interest-rate policy is increasing the risk of misguided investments and could endanger the stability of the financial markets.

The current account balance surplus of the German economy has declined slightly in relation to nominal GDP since 2015. In 2017, its share fell by 0.6 percentage points to 7.7 % and a slight decrease of 0.1 percentage point is expected for 2018. The "Wise Man" Bofinger sees the extremely high dependency on foreign markets as the Achilles' heel of the German economy. This view has prompted him, along with the economists closely associated with the trade unions, to advocate rising wages so that imports can be increased. Ifo President Fuest has now come to see the current account balance surplus as a political problem. Criticism of the German surplus has not been limited to statements by US President Donald Trump only; even his predecessor Barack Obama shared this opinion. "That is why Germany should do something to correct this situation." Improved conditions for the write-off of investments could stimulate domestic economic activities.

High current account balance surpluses imply a high competitiveness of the German economy while the USA is supposedly less competitive. In actual fact, the Swiss IMD World Competitiveness Center in Lausanne rates the USA as the most competitive country in the world.

Key Economic Data – German Council of Economic Experts Assessment of Economic Development

	Unit	2014	2015	2016 ¹	2017 ¹	2018 ¹
Gross Domestic Product ²	%	1.6	1.7	1.9	2.0	2.2
Expenditures for Consumption	%	1.0	2.0	2.5	1.8	1.8
Expenditures for Private Consumption ³	%	0.9	1.7	2.1	1.9	1.8
Expenditures for Public Consumption	%	1.2	2.9	3.7	1.7	1.8
Gross Installation Investments	%	3.4	1.5	3.1	3.6	3.8
Equipment Investments ⁴	%	5.5	3.9	2.2	2.3	5.1
Construction Investments	%	1.9	- 1.4	2.7	4.3	2.6
Other Investments	%	4.0	5.5	5.5	4.2	4.9
Domestic Utilisation	%	1.4	1.6	2.4	2.2	2.3
Trade Balance (Growth Contribution in Percentage Points)		0.3	0.2	- 0.3	0.0	0.0
Exports	%	4.1	5.2	2.6	3.8	4.5
Imports	%	4.0	5.6	3.9	4.6	5.3
Current Account Balance ⁵	%	7.3	8.5	8.3	7.7	7.6
Workforce	Thousands	42,662	43,069	43,638	44,298	44,810
Employees Subject to Social Security Contributions ⁶	Thousands	30,197	30,822	31,485	32,183	32,732
Persons Registered as Unemployed ⁶	Thousands	2,898	2,795	2,691	2,561	2,473
Unemployment ^{6,7}	%	6.7	6.4	6.1	5.8	5.5
Consumer Prices ⁸	%	0.9	0.3	0.5	1.7	1.8
Public Fiscal Balance ⁹	%	0.3	0.6	0.8	1.0	1.1
Per Capita Gross Domestic Product ¹⁰	%	1.2	0.9	1.0	1.4	1.8

1 – Projection of the Council of Economic Experts, 2 – Change over previous year. Applies to all component elements of the GDP shown here, 3 – Including non-profit private organisations, 4 – Including military weapons systems, 5 – In relation to nominal GDP, 6 – Source for 2015 and 2016: BA, 7 – Registered unemployed persons in relation to complete civil workforce, 8 – Change over previous year, 9 – Regional authorities and social security in delineation of national economic total account; in relation to nominal GDP, 10 – Own calculations (of the Council of Economic Experts) for previous year.

Source: Council of Economic Experts, German Federal Statistical Office

HT-DI

Germany is currently no higher than 15th out of 63 countries in the competitiveness ranking and dropped out of the Top Ten in 2016. Germany has slipped behind China (excluding Hong Kong). Hong Kong and Singapore are in second and third place. Two European countries – the Netherlands and Switzerland – follow.

Germany is even lower in the ranking for the state of its infrastructure and educational system. Investments in the future have been falling victim to cost-cutting measures for quite a while. Yet a strong world trade nation in particular requires an outstanding infrastructure and good conditions for imports, exports and logistics companies.

Situation for Energy Business in Germany

The lion's share of primary energy consumption (PEC), about half, goes to energy consumption for heating and refrigeration. That is why oil, just as in the past, remains the primary energy source Number 1 with a share of 34 % while the share of natural gas is 24 %. Renewable energy sources at 13.1 % are in third place. They are followed by lignite (11.1 %) and hard coal (10.4 %), which have traded third and fourth place. Nuclear energy (6.1 %) has fallen far behind and its contribution fell by 9.8 % – the exit from its utilisation by the year 2022 is already clearly noticeable.

The fossil energy sources oil (+2.7 %) and natural gas (+6.2 %) continued to rise – there can be no talk of decarbonisation relating to these two energy sources. A dramatic decrease in the share of hard coal in primary energy consumption by 11.3 % in 2017 over the previous year 2016 is revealed in Table HT-D2. The major reason for this is the significant increase in electric power generation from renewable energy sources, a factor that is also noticeable in the primary energy consumption from renewable energy sources (+6.1 %). Nevertheless, their share of 13.1 % is still modest. There is still a long road to travel before consumption can be fully covered by renewable energy sources. Decarbonisation must place its priorities on the sectors with rising oil and gas consumption and not continue its one-sided focus on power generation.

Primary Energy Consumption in Germany 2014 to 2017								
Energy Source	2014	2015	2016	2017	2017 over 2016		Shares in %	
	Mill. TCE	Mill. TCE	Mill. TCE	Mill. TCE	Mill. TCE	%	2016	2017
Oil	153.3	153.3	155.3	159.5	4.2	2.7	33.9	34.5
Natural gas	91.2	94.9	103.8	110.2	6.4	6.2	22.7	23.8
Hard Coal	60.0	59.0	56.7	50.3	-6.4	-11.3	12.4	10.9
Lignite	53.7	53.4	51.8	51.5	-0.3	-0.6	11.3	11.1
Nuclear Energy	36.2	34.2	31.5	28.4	-3.1	-9.8	6.9	6.1
Renewable Energies	51.8	56.1	57.2	60.7	3.5	6.1	12.5	13.1
Electricity Exchange Balance	-4.2	-5.9	-6.6	-6.7	-0.1	-	-1.4	-1.4
Other	7.7	7.6	8.4	8.4	0.0	0.0	1.8	1.8
Total	449.7	452.6	458.1	462.3	4.2	0.9	100.0	100.0

Source: AGEBA, Analysis Tables for 2014 and 2015 and "Energy Consumption in Germany in 2017 – Annual Report" for 2016 and 2017

Electric Power Generation

Gross Electric Power Generation in Germany per Energy Source						
Energy Source	2014	2015	2016	2017	2017 Share	Change 2017/2016
	TWh	TWh	TWh	TWh	%	%
Lignite	155.8	154.5	149.5	147.5	23 %	-1.3
Nuclear Energy	97.1	91.8	84.6	76.3	12 %	-9.8
Hard Coal	118.6	117.7	112.2	92.6	14 %	-17.5
Natural gas	61.1	62.0	81.3	86.5	13 %	6.4
Oil	5.7	6.2	5.8	5.9	1 %	1.7
Renewable Energy Sources:	162.5	188.6	189.8	218.3	33 %	15.0
Other	27.0	27.3	27.3	27.7	4 %	1.5
Total	627.8	648.1	650.5	654.8	100 %	0.7

Source: AGE B

HT-D3

While the energy transition has not left any traces on the heating market and in the transport sector, it is having a massive impact on the energy mix for electric power generation. Renewable energy sources took over top place for gross power generation back in 2014, and their share is now 33 % (+15 % over the previous year). Lignite follows with a share that has remained constant at 23 % while the share of hard coal has fallen by almost one-fifth (-17.5 %) to 14 %

in only one year. Natural gas at 13 % and nuclear energy at 12 % follow.

Power Generation from Renewable Energy Sources						
Energy Source*	2014	2015	2016	2017	2017 Shares	Change in 2017/2016
	TWh	TWh	TWh	TWh	%	%
Hydroelectric Power	19.6	19.0	20.5	20.2	9	-1.5
Wind Onshore	57.0	72.2	67.8	88.7	41	30.8
Wind Offshore	1.4	8.3	12.3	17.9	8	45.5
Biomass	42.2	44.6	45.0	45.5	21	1.1
Municipal Wastes (50 %)*	6.1	5.8	5.9	5.9	3	0.0
Photovoltaics	36.1	38.7	38.1	39.9	18	4.7
Geothermal Energy	0.1	0.1	0.2	0.2	0	31.6
Total	162.5	188.6	189.8	218.3	100	15.0
Share of Renewable Energies in Gross Electric Power Generation	25 %	29 %	29 %	33 %		

*) Biogenic share of household wastes
Source: AGE B

HT-D4

Wind Onshore provided a share of 41 % of the power generation using renewable energy sources, followed by biomass at 21 % and photovoltaics at 18 %. Wind Onshore underwent a highly dramatic development, growing by 30.8 %. Growth in Wind Offshore at 45.5 % was even stronger; however, it began at a lower level.

Electric Power Generation from Photovoltaics and Wind in January 2018

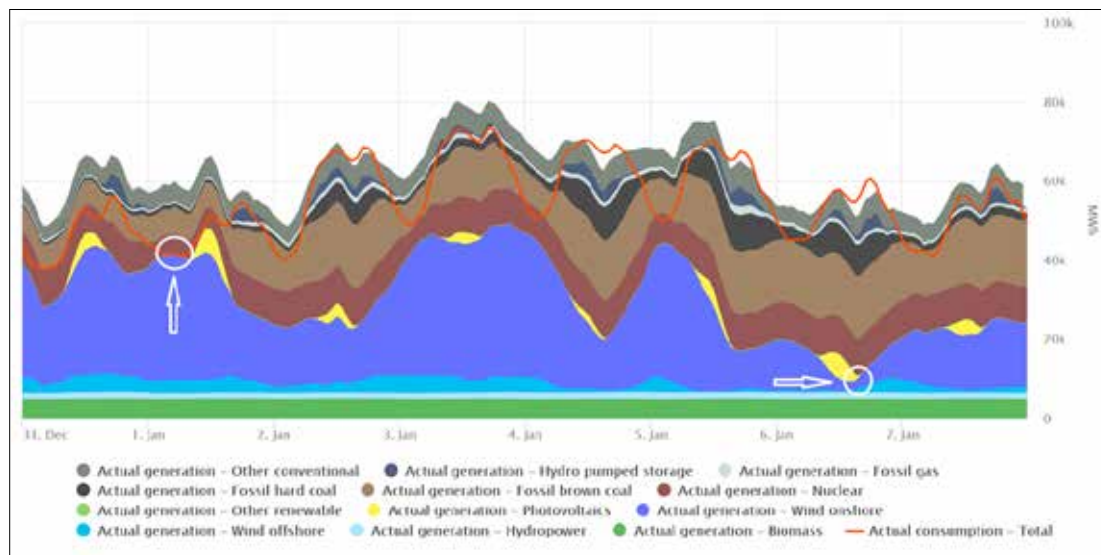


Figure HT1

Although renewable energy sources posted a share in gross electric power generation of 33 %, the fluctuations in their availability over time make it necessary to maintain a second system of fossil fuel-fired power plants. The additional capital costs are not reflected in the costs of the renewable energy sources.

Their economic costs are therefore significantly higher, and power consumers must pay a part of these costs. Figure HT1 shows why we are far from being able to do without fossil energy sources. Early in the morning on 1 January 2018, power consumption was covered completely by renewable energy sources. Over the course of the same day and on the following days, however, increasing use had to be made of fossil energy source until, on the evening of 6 January 2018, wind energy produc-

tion fell drastically and the contribution from photovoltaics disappeared. On this evening, power consumption was covered almost completely by conventional power plants.

This picture very clearly illustrates as well that nuclear and lignite-fired power plants run almost continuously while

hard coal-fired power plants are available as flexibility services that can compensate the fluctuations in renewable energies. The significance of the energy system as a whole and the security of its ability to supply demand must again be emphasised more strongly. The supply of heating from hard coal-based CHP plants as well as secure grid operation must also be viewed from this perspective.

The higher the share of fluctuating feed-in of power from renewable energy sources, the more frequently expensive interventions by the grid operators to stabilise the power grid are required. The situation is made even worse by the additional construction of renewable sources for solely politically rather than economically motivated reasons in regions where power demand is significantly lower. This system cannot function unless grid expansion, as a minimum, keeps pace with the expansion of renewable energy sources.

Nothing could be farther from reality at the moment. In the construction of power lines, the projects based on the Federal Requirement Planning Act (BBPlG) and on the Power Line Construction Act (EnLAG) are lagging behind the development of the renewable energy sources. Of the 5,900 km provided within the scope of the BBPlG, 150 km have been realised – about 2.5 % of the total length. Things look a little better for the projects based on the EnLAG: 750 of the total 1,800 km have been completed, 40 % of the total length. Overall, however, the deficit in power line construction is still very great.

In 2017, hard coal-fired generation of electric power in Germany fell, as mentioned above, by 17.5 %. Hard coal-fired power generation is on a drastic decline because of the general conditions of the energy transition and is

being pushed aside by renewable energy sources and, in part, by subsidised natural gas-based cogeneration of heat and power. The discontinuation of hard coal-fired power generation is today reality and no longer requires an explicit political decision for realisation. Despite everything, hard coal-fired power plants will still be needed. They are serving today more and more as security (backups) for the energy transition. The German government should initiate measures to maintain hard coal-fired power plant capacities and the flexibility of their operation instead of questioning their existence. They are urgently needed within the framework of the energy transition as Figure HT1 demonstrated.

In view of the limited potential of hydroelectric power in Germany and the state of technology at this time, a system relying solely on renewable energy sources cannot survive a period of the dark doldrums lasting two or three weeks. Even using the lowest-cost form of long-term storage that is already available today (the pumped-storage power plant), bridging a period of this length could be made possible only with a completely unrealistically gigantic investment programme. As a calculation example that does not claim to be feasible for practical realisation, imagine (assuming a contribution from renewable energy sources of 5 % during dark doldrums) that 60 pumped-storage power plants (PSPP) the size of the PSPP Goldisthal (in Thuringia) were built to cover 95 % of the annual peak load. After only 8 hours, the upper reservoirs would be empty, meaning that 180 PSPPs would be required to bridge only one single day. That would mean about 2,500 PSPPs for 2 weeks. Based on investment costs of 2003, a total of € 1.6 trillion would be required for this construction. Since most storage solutions are considerably more expensive, investment expenditures of

several trillion euros would be expected (batteries, power to gas etc.).

This demonstrates that for the foreseeable future only fossil fuel-fired power plants come into question as backups and as flexibility reserves for the energy transition. Both current hard coal-fired power plants and natural gas-fired power plants can be used for this purpose and can act as partners to renewable energy sources to compensate the latter's limitations. An exit from hard coal-fired power generation and simultaneously massive investments in gas turbines would not be economically justifiable.

In contrast, an economically reasonable alternative would be to use the currently operating hard coal-fired and natural gas-fired power plants as backups. Hard coal-fired power plants operated by VDKi member companies are now capable of cutting back to 20 % or less of the nominal load during partial load operation. This means that they are substantially better than even combined cycle power plants. Only the speed with which the load can be changed is not quite as fast. In comparison with open-cycle gas turbines, power plants with a steam process – and combined cycle power plants belong to this group – inevitably display slower cold start times. This is compensated, however, by their degree of efficiency, which is significantly greater than for the faster open-cycle gas turbines. Moreover, the wear on gas turbines during load cycling is enormous. So far, in any case, there have been no instances of large-scale investments in modern open-cycle gas turbines. On the contrary, the only known case at this time is one in which a number of small gas motors have been installed because of the enormous wear on the turbines. The investment costs in such a case, however, are substantially higher than for one turbine. This is an option

that does not come into question until after the utilisation of existing power plants – in terms of an approach in conformity with market principles, anyway.

Under current market conditions, the efficient combined cycle power plants are constructed only if there is financial subsidisation such as that provided by the Combined Heat and Power Plant Act of 2016 in conjunction with the need for heating. In the Scenario Framework 2019 to 2030 for the grid development plan Electricity, Scenario A2030 assumes that there will be construction of such power plants with additional output of 1,000 MW. The lion's share of additional construction, 4,500 MW, on the other hand, is expected to come from small CHP plants with production under 10 MW. Scenario B2035 foresees an additional 1,500 MW in small CHP plants. As it looks today, there is reason to doubt that these local power plants can be operated like a large gas turbine in an emergency. They do not provide a secure production reserve in emergencies, especially during the heating period.

If fossil energy sources are to be able to fulfil their responsibilities for the energy transition, the appropriate general conditions must be implemented. The required capacity and flexibility must be rewarded financially. Capacity services could be financed completely by the electricity price. This would assume (among other factors) that extremely high electricity prices were permitted for a few weeks during the year.

The more the government intervenes, the more government support it must ultimately provide for capacity services. That is why many member states of the European Union have accepted capacity markets, and the

European Union is in the process of regulating the conditions for these markets. There is a risk here that a CO₂ threshold will be set which is so high that compliance will be possible only by selected new plants. If current hard coal-fired power plants are allowed to participate in a capacity mechanism solely during a transition phase, the provision of power plant reserves will become even more expensive. Moreover, it is economically unreasonable to hinder the use of hard coal-fired power plants because the specific emissions are irrelevant for climate protection from a global perspective because they will operate for so few hours. The German government must urgently act to ward off such actions in Europe.

Climate Protection Plan 2050

The Climate Protection Plan 2050 of 14 November 2016 defined for the first-time sector targets for the reduction of CO₂ (Figure HT2). The target for 2030 set here was a reduction of CO₂ equivalent emissions by a total of between 55 % and 56 % in comparison with 1990. The target for the energy industry was set even higher: a reduction of emissions by 61 % to 62 %. In contrast, below-average sector targets were set for transport and agriculture. The most serious reservation about these targets is that the largest energy consumption sectors are still not obligated to do their honest share.

The Sector Targets in the Climate Protection Plan 2050 (in Mill. t CO₂ Equivalents)

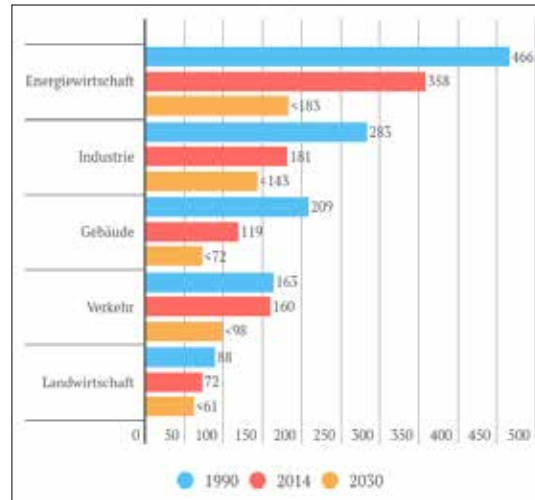


Figure HT2, Source: Federal Ministry for the Environment, Nature Conservation, Construction and Nuclear Safety (2017)

In January 2018, the Federation of German Industries (BDI) presented a study prepared by the Boston Consulting Group (BCG) and Prognos entitled “Climate Paths for Germany” that was intended to serve as a contribution to the discussion about future energy and climate policy objectives and as support for the review of the Climate Protection Plan 2050 scheduled for 2018. The intention of the study was not to present a “road map” as is usual in the political sphere, but to consider in various scenarios how possible economically acceptable reduction paths could be established in the various sectors. Based on this study, the BDI derived the following recommendations for political action (among others) across sector boundaries:

“The German government:

- ... must encourage internationally oriented ambitions for the implementation of climate targets that will maintain the competitiveness of German industries in the sense of a level playing field and simultaneously strengthen the opportunities to sell climate technology from Germany on growing export markets;
- ... should not pre-define inflexible sector targets and technology prohibitions, but instead aim at achieving the overall target by 2050 using all appropriate technologies and efficiently with respect to costs. The double regulation of plants subject to the ETS [i.e. bound by the obligations of emission trading] must be avoided.”

The study comes to the conclusion that 61 % of the greenhouse gas emissions in Germany could be reduced in comparison with 1990 if the political actions that have already been decided and the current efforts in climate protection are simply maintained between now and 2050. A stricter national political climate target of 80 % could, under certain circumstances, be achieved technically and at an acceptable economic cost by using the technologies that are already known today or in a calculable stage of development. The BDI emphasises, however, that this would require substantial additional efforts. Above all, the BDI points out that single countries or even federations of countries such as the EU itself will be unable “to stop climate change alone even by making massive expenditures.” The top priority of German climate policy must consequently be “to create internationally comparable general conditions for climate protection.” Logically speaking, a national target of 95 % must be rejected if no comparable measures are implemented at the global level.

The study comes to the conclusion that the achievement of the 80 % target and the 95 % target would involve additional investments of € 1.5 trillion and € 2.3 trillion, respectively. These figures could be even higher if the political realisation is less than ideal. The additional investments would be offset by the potential to save energy costs so that additional costs of € 470 billion and € 960 billion, respectively, would result if no comparable global measures are implemented and Germany would go it alone. The required additional investments for the electric power sector can be used as an example. Additional investments of between € 440 billion and € 620 billion would be required depending on the scenario. The funds would be needed (for example) for the construction of storage facilities (between 16 GW and 30 GW) and gas-fired power plants (between 61 GW and 75 GW). It should be noted that first, however, it would be necessary to find investors who would be satisfied with 770 full-load hours for the politically desired 80 % climate path or even as little as 640 full-load hours in the 95 % climate path as capacity utilisation for natural gas-fired power plants. Furthermore, the BDI study points out that in future not the efficient combined cycle power plants, but open-cycle gas turbines would be built, and these plants – as described above – have a poorer degree of efficiency than hard coal-fired power plants.

In addition, the use of synthetic fuels would have to be incorporated into the model if the 95 % climate path is to be realised. Even Jochen Flasbarth, State Secretary in the Federal Ministry of the Environment, warns against any “over-emphasis” on synthetic fuels because of their poor efficiency. An electricity-based gas drive requires six times as much, an electricity-based drive using liquid

fuels seven times as much energy input as an electric car drive using batteries for the same vehicle performance. Based on this ratio, the capacity of renewable energy sources would have to be increased by a factor of six or seven if vehicles running on synthetic fuels were supposed to replace conventional electric cars. Flasbarth: "Anyone who sees power-to-X technologies as aspirin for all possible ailments will not be able to realise a sustainable energy transition."

In view of the dimensions of the additional investments and additional costs, efficient economy measures must be realised. The BDI comes to the conclusion that "tonne precision and inflexible sector targets for 2030 or 2050" are not reasonable because they artificially restrict the possible solutions and make climate protection unnecessarily expensive. This presumes instead openness to technologies and cost efficiency. Inflexible sector targets must not be set in particular for the industries that are subject to European emission trading and that must therefore meet a European target, and a double regulation would also be unacceptable in this case. The sensible approach involves finding the right mix of instruments for the various fields instead of sector targets.

The BDI does not regard a "government-ordered exit from coal to be expedient for achieving the desired goals." An exit from coal and nuclear energy would, in the next ten years, entail significant risk of a rise in wholesale prices on the energy market. Let us note here that the gas price would have to fall drastically to preclude this risk. Irrespective of the legal question of whether the government can even mandate an exit from coal, an approach was selected for the study that the

economic costs of a politically ordered exit from coal were included in so far as the capital costs of the power plants removed prematurely from the grid were included in the economic costs. To this extent, the BDI indirectly included compensation for the power plant owners in the amount of the capital costs in the model. In the event of the realisation of the 95 % climate path, the premature shutdown of the lignite-fired power generation by the beginning of the 2030 decade would be necessary. Costs for the premature closure and renaturation of the opencast pits and for the management of the structural transformation in the affected regions would also be incurred. No attempt was made, however, to quantify these costs and they are consequently not included in the economic costs.

So much for the observations for the future in the BDI study "Climate Paths for Germany". When we look at the present, we notice that the current energy policies of Germany do not satisfy the demands of the BDI study. There is unilateral discrimination against hard coal. A look at CO₂ emissions in Germany by energy source reveals this: in 2017, a reduction in CO₂ emissions in comparison with the previous year occurred only for hard coal – and that by 11.3 %. The emissions from the use of liquid fuels – i.e. oil products – on the other hand, rose by 3.5 %. The highest growth came from the use of gaseous fuels, i.e. natural gas, at 5.2 %. This demonstrates that the focus on the energy industry and more specifically on coal applies distorted standards.

The fact that CO₂ emissions from the operation of hard coal-fired power plants are declining sharply while the emissions from the use of oil and natural gas are rising

**CO₂ Emissions from Energy Generation
in Germany by Energy Source**

	CO ₂ -Emissions		Change	Emission Shares	
	2016	2017 ¹⁾	2017/2016	2016	2017
	Mill. t	Mill. t	%	%	%
Oil	252.1	261.0	3.5	33.5	34.7
Hard Coal ²⁾	142.0	126.0	-11.3	18.9	16.8
Natural Gas ³⁾	168.2	177.0	5.2	22.4	23.5
Lignite	167.4	166.0	-0.8	22.3	22.1
Other ⁴⁾	22.0	22.0	0.0	2.9	2.9
Total	751.7	752.0	0.0	100.0	100.0

1) Provisional, 2) Incl. furnace and coke oven gas, 3) Incl. mine gas,
4) Incl. volatile emissions
Source: Schiffer, Hans-Wilhelm, "German Energy Market 2017", et 3/2018

HT-D5

shows above all that simple answers such as “away from coal” only hamper the success of the energy transition as a whole. Larger energy consumption sectors such as transport and heating are at a risk of being overlooked. The Bundesverband Wärmepumpe recently calculated that electric power is currently burdened with levies in the amount of € 185/t CO₂ while the corresponding figures for natural gas are € 18/t CO₂ and for fuel oil € 8/t CO₂ (energate, 01/02/2018).

The government levies on electric power are much too high even today. They must not be increased even further by a government-mandated “exit from coal” in whatever form it might take. It is consequently correct that the new German government are not seeking a national price increase in the form of a set CO₂ price above the market price of emission trading. This would secure advantages above all for the countries exporting natural gas while the environmental benefits within the framework of the European emission trading would be nil.

**Coalition Agreement Between CDU, CSU
and SPD: “A New Beginning for Europe –
New Dynamics for Germany” of
7 February 2018**

In the coalition agreement, the German government stated that they wanted to “make Germany a site of LNG infrastructure” (No. 3347). In carrying this out, they must keep in mind that the use of natural gas also causes CO₂ emissions and that it makes at this time the major contribution to the growth of CO₂ emissions in Germany. Finally, note must be taken of the methane emissions along the entire transport chain for natural gas, especially when the natural gas is obtained from fracking and supplied as LNG from the USA to Germany, for instance. The recent study “Reduced biomass burning emissions reconcile conflicting estimates of the post-2006 atmospheric methane budget”, published on 20 December 2017 in Nature Communications (8: 2227, | DOI: 10.1038/s41465-017-02246-0), confirms the results of earlier studies demonstrating that the fracking process releases substantial quantities of the highly potent greenhouse gas methane.

The clear commitment in the coalition agreement to an organisation of the expansion of renewable energy sources in conformity with the market in future and its development in step with the expansion of the grids and storage capabilities is a welcome one. Nevertheless, in view of the intensified target requirements and the increase in the renewable target to 65 %, it is crucial to concretise this quickly. Moreover, the corresponding grid expansion and the utilisation of these additional capacities must be secured. As mentioned above, however, the grid expansion programme is making almost no progress at this time. The previous German government already wanted to establish a commission called “Growth, Structural

Transformation and Regional Development” that was to start its work at the beginning of 2018 and present its results by the end of 2018 if at all possible and had set up a staff unit called “Structural Transformation Lignite Regions” with this in mind. The exit from the “high-emission electric power generation using lignite” entails major structural-political challenges for the German lignite regions. That is why the objective is to achieve a “balance between climate protection and industrial policy goals.”

During the coalition negotiations, however, a shift in priorities occurred and now it is no longer a matter of the reduction in electric power generation using lignite alone; instead, an exit from coal-fired electric power generation as a whole is to be decided. Chapter “XI. Responsible Utilisation of Resources” of the coalition agreement states the following: “We will create a new, integrated energy system comprising renewables, energy efficiency, an accelerated expansion of the power grids, a step-by-step reduction of electric power generation using fossil energy sources and the expedited use of digitalisation. Climate and environmental compatibility, supply security and affordability are the cornerstones of this energy policy. The maintenance of our competitiveness as a strong industrial economy is the fundamental prerequisite for a successful energy transition that becomes a model of success on the international stage as well.”

The “step-by-step reduction of electric power generation using fossil energy sources” is to be carried out in the following manner: “We will appoint a commission ‘Growth, Structural Transformation and Employment’ whose members come from the various sectors of politics, business, environmental protection associations, trade unions and the affected states and regions. The commission will be

charged with the task of developing by the end of 2018 an action programme based on the action programme Climate Protection 2020 and the Climate Protection Plan 2050 and containing the following elements:

- Actions aimed at closing the gap to the achievement of the target of 40 % reduction by 2020 as far as possible;
- Actions that will reliably assure achievement of the 2030 target for the energy sector, including a comprehensive estimate of the consequences;
- A timetable for the step-by-step reduction and end of coal-fired power generation, including a final date and the necessary accompanying legal, economic, social and structural policy measures; and
- The financial security for the required structural transformation in the impacted regions and a fund for structural transformation endowed by the German government.

Parallel timetables for the construction and transport sectors are to be established.”

Although there were substantial time delays, not only in forming a government, but also in adopting the resolution for establishment of the commission, a plan for the discontinuation of coal-fired electric power generation is still to be prepared in this year. As of the end of May 2018, however, the coalition was still having problems agreeing on the membership of the commission. The question of who would chair the commission was the subject of especially heated dispute. According to the FAZ of 30 May 2018, agreement was at least reached that the business office foreseen for the Ministry of Economics would be “a business office fulfilling the tasks of a secretariat.” This is aimed at limiting the opportunities for Federal Economics Minister Altmaier to exercise any

influence. On 6 June 2018, the German cabinet finally adopted a resolution to establish the commission. There has been a major change in the order of the four points of the coalition agreement mentioned above in the establishment resolution. This was understood in part as a prioritisation. Instead of the first two climate policy points, the draft for a cabinet resolution begins with “concrete prospects for new, future-proof jobs in the affected regions” and the “development of a mix of instruments combining economic development, structural transformation, social compatibility, social solidarity and climate protection.” The third point is devoted to the “investments in the regions and economic sectors affected by the structural transformation.” Points four, five and six concern climate targets and the exit from coal and are highly precise. “Actions [are to be drafted] that will reliably assure achievement of the 2030 target for the energy sector, including a comprehensive estimate of the consequences. The requirement for the reduction of emissions from the energy industry by 61 % to 62 % in 2030 in comparison with 1990 is derived from the climate protection plan.” This is a very concrete and hard target and apparently a milestone for a “plan for the step-by-step reduction and termination of coal-fired electric power generation, including a definitive final date.” Finally, “measures relating to the contribution of the energy industry” to close “the gap for achievement of the 40 % reduction target” are to be proposed.

The commission has 24 members. Their representatives have been drawn from local initiatives against lignite mining, environmental protection organisations, trade unions, business and academia. Three non-voting representatives from the Union and SPD as well as representatives from the government participate. The commission

also has four chairpersons. Stanislaw Tillich (CDU) and Matthias Platzeck (SPD) are two former governors from the East German lignite states Saxony and Brandenburg. The former Chancellery Minister Ronald Pofalla (CDU), member of the Management Board of Deutsche Bahn, comes from North Rhine-Westphalia. Also, chairperson is the environmental economist Barbara Praetorius, who is Senior Advisor to Agora Energiewende. Representatives of professional associations were deliberately not appointed to the commission. The commission has the political mandate to submit a proposal for a socially acceptable end to lignite mining that does not lead to massive resistance among the general public before the upcoming state elections in the states of the former East Germany. The official charge reads to prepare a timetable “for the step-by-step reduction and end of coal-fired electric power generation, including a final date and the necessary accompanying legal, economic, social, renaturation and structural policy measures.”

In view of the difficult start and the complex requirements of the mandate, the hard time requirements appear initially surprising. The financial framework for the “social and structural-political development of the lignite regions” is scheduled to appear at the end of October. A final report is to be prepared by the end of 2018. The time pressure is obviously a consequence of the desire to present recommendations for the closing of the gap to achievement of the 40 % reduction target by 2020 before the 24th UN Climate Conference (COP24) that will be held between 3 and 14 December 2018. This pressure cannot be explained by any binding requirements under international law, however, nor does the agenda for COP24 make any such demands.

Since the commission has the mandate to set targets for the entire electric power generation sector, resolutions to the disadvantage of hard coal-fired generation of electric power are also to be feared. In view of the substantial decline in the use of hard coal for electric power generation, any resolutions regarding an exit from hard coal-fired generation of electric power are superfluous. The next figure shows that if the developments of the years 2017 and 2018 continue, the reduction targets of the Climate Protection Plan 2050 will be achieved without any further ado.

The use of hard coal for electric power generation has been falling since the end of the 1990s. During the period from 1990 to 2016, it decreased by 28 %. Because of the precipitate drop in 2017, there was a decrease of 40 % for the period 1990 to 2017. Hard coal has therefore achieved the 40 % reduction target well before 2020.

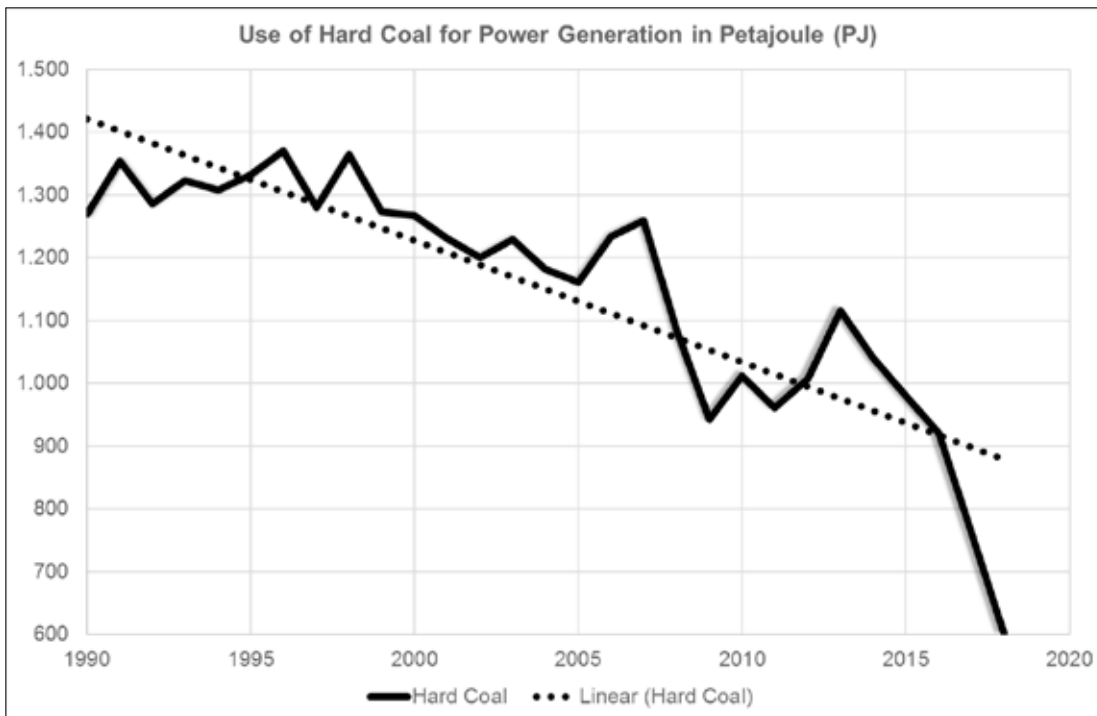


Figure HT3, Source: Federal Ministry of Economics, AGEb; VDKi estimate for 2018 based on Q1 2018

During the first quarter of 2018, electric power generation using hard coal declined in comparison with Q1 2017 by almost 20 %. If we assume a development similar to the first quarter for the entire year 2018 (-20 %), there will be a decline of 52 % in comparison with 1990. This is a reduction by more than half – the reduction by half in the political discussion for 2030 will thus presumably be achieved as early as the end of 2018. If this trend in hard coal-fired electric power generation continues (and that can be assumed in view of the ongoing expansion of renewable energy sources and the rising CO₂ prices), the sector target from the Climate Protection Plan of 61 % to 62 % in 2030 would presumably be achieved without the need for any more extensive political decisions and actions.

Even though hard coal-fired electric power generation has been reduced sharply, the fluctuations in electric power generation from wind mean that it is not possible to do away with hard coal-fired power plant production. Following a conversation with the Frankfurter Allgemeine Zeitung of 21 May 2018, the president of the Federal Network Agency, Jochen Homann, was quoted as saying that half of the coal-fired power plant capacities could be closed by 2030 without any problems. In fact, he said that the supply security would not be at risk provided that “the required grid expansion has been concluded by then and ... the market has realised the replacement natural gas-fired power plants that have been planned. This will also be a subject of discussion in the Coal Commission.” Indirectly, he indicated that this will not be possible on the basis of the current progress of grid expansion. Moreover, the “Scenario Framework 2030” of the grid operators, to which the president of the Federal Network Agency refers, is based on a limitation of the useful life of the hard coal-fired power plants to 50 years in the Basic Scenario A2030

and even further to 45 years in Scenario B2030, in which a reduction by half appears possible. In this sense, this represents an intervention in the ownership rights of the power plant operators. The remark: “This will also be the subject of discussion in the Coal Commission,” presumably refers in part to this aspect, in part to the question of how new natural gas-fired power plants could be operated after this type of intervention in ownership rights. The Scenario Framework 2030 of the grid operators provides some information here. The calculation in Scenario B2030 presumes that the hard coal-fired power plant capacities could be reduced by **13 GW** because of the aforementioned intervention in ownership rights. In this scenario, however, this would be compensated only in part by additional construction of natural gas-fired power plants with capacities of **6.3 GW** by 2030. Only 1.8 GW would be provided by combined cycle power plants, however. The remaining 4.5 GW are supposed to be realised by CHP plants with output under 10 MW. This makes two things clear. First, the willingness to invest in compensation of the current hard coal-fired power plant capacity through large natural gas-fired power plants is presently non-existent. Second, the presumed mini power plants are not capable (based on current technology, anyway) of compensating load fluctuations as competently as large power plants. Moreover, they offer no more than limited reserve capacity during heating periods, but this is precisely the time when there is a threat of dark doldrums. We refer here to the aforementioned BDI study “Climate Paths for Germany” concerning the possible degrees of capacity utilisation of natural gas-fired power plants in future. The study’s conclusion is that by 2050 in the reference case 1,550 full-load hours will be possible, but in the 80 % climate path only 770 full-load hours and in the 95 % climate path no more than 640 full-load hours will be possible.

Hard Coal Market

Primary energy consumption of hard coal (HT-D6) fell by 6.4 million TCE (11.3 %) from 56.7 million TCE to 50.3 million TCE in 2017. As mentioned above, the operation of hard coal-fired power plants declined by 17.2 % in 2017 while the operation of the steel industry increased slightly by 0.6 %. All in all, there was nevertheless still a significant decrease by 11.3 %. Hard coal consumption (in million TCE) was covered in 2017 as shown below:

Utilisation of Hard Coal in Germany

	2014	2015	2016	2017	2017/2016 Change
	Mill. TCE				%
Power Plants	39.2	38.8	37.3	30.9	-17.2
Steel Industry	17.5	18.5	18.1	18.2	0.6
Heating Market	1.4	1.3	1.3	1.2	-7.7
Total	58.1	58.6	56.7	50.3	-11.3

Source: AGEB

HT-D6

The share of domestic production in coal utilisation (HT-D7) fell from 3.9 million TCE to 3.6 million TCE in 2017. The scheduled adaptation and exit process in socially acceptable boundaries will continue its orderly progress until the end of this year. At the end of the year, the mines still in operation, Prosper-Haniel in Bottrop and Anthrazit in Ibbenbüren, will be closed. The contribution of import volumes to coal utilisation fell from 53.6 million TCE to 48.5 million TCE (-9.5 %) according to statistics from the Arbeitsgemeinschaft Energiebilanzen (AGEB). As noted by AGEB, imports contributed 93 % to the secure and high-quality supplies for the German market.

Volume of Hard Coal in Germany

	2014	2015	2016	2017	Change 2017/2016
	Mill. TCE				%
Import Coal	52.3	53.5	53.6	48.5	-9.5
Domestic Production	7.8	6.4	3.9	3.6	-7.7
Total	60.1	59.9	57.5	52.1	-9.4

Source: VDKI, own calculations

HT-D7

The quantity difference between Tables D6 and D7 is explained by the fact that in the one case volumes, in the other utilisation are shown, and deviations are possible because of stockpile movements.

The quantity difference between the volume of import coal in Table D7 and the total imports in Table D8 is a consequence of the use of different measurement units. AGEB calculates volume in "TCE" while imports are calculated per quality grade in "t=t". Since primarily steam coal with calorific values below 7,000 kcal/kg is utilised, the "t=t" figures are higher than the "TCE" figures.

Imports (in t=t) break down per grade as shown here:

Imports per Grade in Mill. t (t=t)				
	2014	2015	2016	2017
	Mill. t	Mill. t	Mill. t	Mill. t
Steam Coal ¹⁾	41.9	43.2	42.9	36.2
Coking Coal	11.8	12.3	12.3	12.9
Coke	2.5	2.0	2.0	2.3
Total	56.2	57.5	57.2	51.4
¹⁾ Including anthracite and briquettes				
Sources: Statistics from Kohlenwirtschaft/own calculations				

HT-D8

The share of imports of steam coal declined from 74 % to 70 % while the share of coking coal rose from 22 % to 25 %. The share of coke rose from 3.8 % to 4.5 %.

The origins of the import volumes can be seen in Figure HT4. Russia leads the list, providing 19.7 million tonnes (38 %). Russia increased exports to Germany by 2.1 million tonnes in comparison with the previous year (+12 %). The only other country able to increase volume was Canada, rising by 2.3 % to 1.5 million tonnes. Colombia, on the other hand, suffered massive losses of sales (-40 %). Imports declined from 10.8 million tonnes (2016) to 6.5 million tonnes so that the contribution to the market supply also decreased to 13 %. The USA overtook Colombia and posted a market share of 18 %.

Australia's contribution decreased from 6.6 million tonnes to 5.6 million tonnes, corresponding to a share of 11 %. Imports from Poland fell sharply (-27 %) and contribute now 5 % to the supply to the German market.

Russia strengthened its position as the largest provider of

steam coal, increasing to 49 % in 2017 from 40 % in the previous year. Colombia at 18 % after 26 % in the previous year is barely ahead of the USA (16 %). South Africa follows with a share of 4 %.

Hard Coal Imports to Germany, Incl. Coke, by Provenance in Million Tonnes

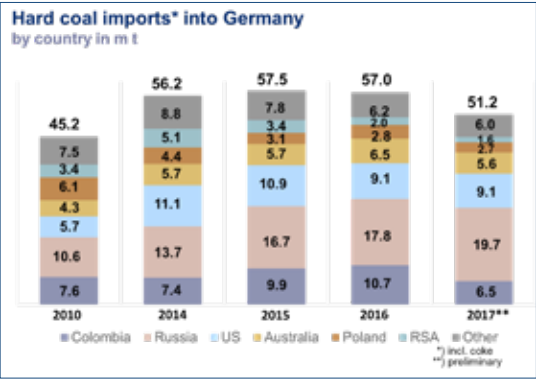


Figure HT4

The most important suppliers of coking coal were Australia (5.5 million tonnes, 43 % market share; previous year 50 %), the USA (3.4 million tonnes, 26 % market share; previous year 23 %), Russia (1.8 million tonnes, 14 % market share; previous year 11 %) and Canada (1.5 million tonnes, 11 % market share).

The major share of German coke imports comes from Poland (63 %). The Czech Republic (12 % share of market supply) and the People's Republic of China (8 % share) follow.

The coal imports to Germany by country of origin are broadly distributed across all grades. Virtually all of the countries are politically stable.

Logistics in Germany's seaports and in the ARA ports important for German imports were not subject to any disruptions and were reliable.

Development of Energy Prices

Prices of Selected Energy Sources Free Power Plant in €/TCE

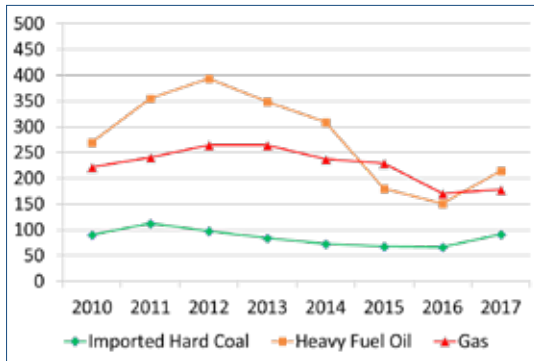


Figure HT5, Source: Statistics of Kohlenwirtschaft e.V./BAFA

Figure HT5 shows the development of selected energy sources free power plant for the last eight years. Following a peak in 2012, heavy fuel oil posted the sharpest downward trend. The price did not bottom out until 2016. In 2017, the price for heavy fuel oil rose by 42 %, a stronger increase than that of imported steam coal (37 %) and substantially stronger than for natural gas in power plants (4 %). So the natural gas price did not follow oil prices in 2017. The price for import coal is nevertheless still well below the level of the competing energy sources.

Energy Prices Free Power Plant as an Annual Average

	2014	2015	2016	2017	2017/2016 Change
	€/TCE				%
Heavy Fuel Oil (HS)	309	180	151	215	42 %
Natural Gas	237	229	171	178	4 %
Steam Coal	73	68	67	92	37 %

Source: Statistics of Kohlenwirtschaft e.V.

HT-D9

The average price for the year for heavy fuel oil came to € 215/TCE (HT-D9); the natural gas price for power plants was € 178/TCE; and the border-crossing price for import coal was € 92/TCE. The competitiveness of natural gas in power plants consequently improved as an average for the year.

Clean Spark Spread and Clean Dark Spread

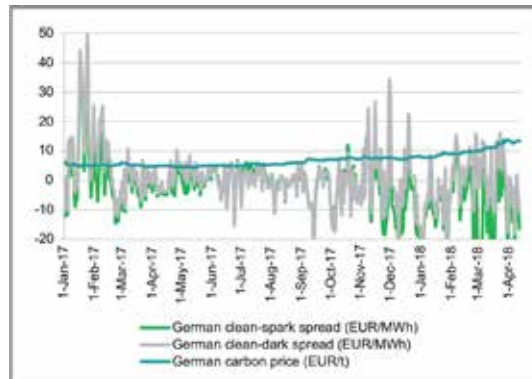


Figure HT6, Source: IHS; Comparison new natural gas-fired power plant with old hard coal-fired power plant; price level April 2018

However, the energy price alone is not decisive for the use of hard coal in power plants; a number of influencing factors combine, summarised in the clean dark spread and clean spark spread, the gross margins of hard coal-fired and gas-fired power plants that are dependent on the CO₂ price and electricity price. Irrespective of the competitive situation with natural gas, the gross profit margin for hard coal is far too low for profitable operation of power plants. Figure HT6 shows that over the course of 2017 both the clean spark spread and the clean dark spread were frequently negative and that, as a tendency, the clean spark spread was more likely to be below the clean dark spread. If natural gas was nevertheless able to take market shares away from hard coal, price development was obviously not the only reason. Instead, the favouring of natural gas through energy policies, especially the Power-Heating Coupling Act of 2016, played a decisive role here.

The cross-border prices for coking coal developed as shown below:

Cross-Border Prices for Coking Coal in €/Tonne ¹⁾		
	2012	188.42
	2013	127.19
	2014	104.67
	2015	100.28
	2016	87.68
	2017	176.03
Change over Previous Year		100.8 %
<small>1) Rounded-off average values for all metallurgical coal types; Source: DESTATIS/VDK own analysis</small>		

HT-D10

In 2017, the price for metallurgical coal doubled exactly from € 88/tonne (2016) to €176/tonne. World crude steel production in 2017 rose significantly by 4.3 %. The rise in Germany at 3.1 % was not far behind.

The cross-border prices for hard coke developed as shown below:

Cross-Border Prices for Hard Coal Coke in €/Tonne ¹⁾		
	2012	258.72
	2013	204.88
	2014	193.66
	2015	187.04
	2016	159.82
	2017	256.30
Change over Previous Year		60.4 %
<small>Source: DESTATIS/VDK own calculations</small>		

HT-D11

The coke prices rose by an average for the year of € 96/tonne (60 %) – not quite as sharply as coking coal.

Steel Production

Crude Steel and Pig Iron Production					
	2014	2015	2016	2017*	Difference over Previous Year
	Mill. t	Mill. t	Mill. t	Mill. t	in %
Crude Steel	42.943	42.676	42.080	43.400	3.1 %
Pig Iron	27.379	27.842	27.270	28.410	4.2 %

Source: Stahl-Online (2014-2016) / worldsteel.org (2017) *)Estimated

HT-D12

Crude steel production in Germany in 2017 rose by 3.1 % to 43.4 million tonnes; pig iron production increased by even more, by 4.2 %, to 28.4 million tonnes in 2017. As previously mentioned, world steel production increased even more strongly than in Germany (by 4.3 %). In contrast, world pig iron production rose by only 1.3 %.

The situation on the world steel market is dominated by market development in China. Overcapacities in China have a powerful influence on the level of world market prices. The year 2017 surprised most players in so far as the Chinese government actually realised the announced reductions in capacity. Nevertheless, the remaining capacities still supplied an increase in crude steel production of 2.9 %. Pig iron production rose by 1.4 %. Since demand for steel was higher in 2017, however, the level of steel prices worldwide stabilised. Determining the outlook for 2018 is difficult in that the development of production in China is subject to substantial influence from the political side.

EUROPEAN UNION

Economic Growth in Europe

Economic growth in the European Union (EU 28) increased strongly in 2017. The growth rate of real gross domestic product (GDP) in 2017 came to 2.4 % over 2.0 % in the previous year (2016). While development in the eurozone in recent years was less striking than in the EU 28, the growth rate in 2017 rose from 1.8 % in 2016 to 2.4 % so that growth in the European Union and the eurozone was comparable.

The highest growth rates in 2017 were posted by the following countries:

Ireland	7.8 %
Romania	6.9 %
Malta	6.6 %
Slovenia	5.0 %
Estonia	4.9 %
Poland	4.6 %
Latvia	4.5 %

This dynamic development is impressive, but for the development of the European Union and the eurozone the size of the national economies is also important. In the table below, the most important countries in the eurozone are sorted according to their share in the gross domestic product of the eurozone. Of the smaller to large European economies shown in Table HT-EU1, Spain and the Netherlands showed above-average development. The growth rate for each of these countries was over 3 %. Italy, Belgium, France and Germany experienced below-average development, whereby the latter two countries had growth of 2.2 % and were very close to the average. They also had a decisive impact on this average because Ger-

many and France together represent half of the economic performance of the eurozone. Starting from low growth, economic growth in Italy accelerated to some degree, but the general economic conditions in this country are likely to lead to further uncertainty on the financial markets. In view of a contribution of no less than 15 % to the gross domestic product of the eurozone, we must hope that the government formed in June 2018 does not endanger the stability of the eurozone.

Share in GDP of Eurozone and Economic Growth EU 19/EU 28 in Per Cent				
Member States	Share in GDP of Eurozone	2015	2016	2017
Countries of the Eurozone (EU 19) ¹⁾		2.1	1.8	2.4
EU-28		2.3	2.0	2.4
Germany	29.2	1.7	1.9	2.2
France	20.5	1.1	1.2	2.2
Italy	15.4	1.0	0.9	1.5
Spain	10.4	3.4	3.3	3.1
The Netherlands	6.5	2.3	2.2	3.2
Belgium	3.9	1.4	1.4	1.7
¹⁾ Until 31/12/2014 EU 18 Source: Eurostat, per: 05/06/2018				

HT-EU1

The economic report published by the FAZ at the beginning of June gives rise to a certain doubt about a continued upswing in Europe. The current growth forecasts of the European Commission could certainly justify confidence. Despite the weaker start in the first quarter, it expects growth of 2.3 % for 2018. The European Union appears to be on a stable path of growth after overcoming the crises of the previous years. Unemployment fell to 8.5 % in April, following a long period of double-digit unemployment.

The Economic Sentiment Indicator (ESI) of the EU Commission, which measures the mood of companies and consumers, has fallen three times in succession in recent months, however. At least it stabilised in April 2018. Falling unemployment and the improved financial position of households led to a brightening of the mood. In May 2018, however, this index fell again because the mood in the manufacturing industries and in the service sector worsened. The Business Climate Indicator of the EU Commission decreased several times during the first quarter because the assessment of the order books of companies worsened. This was caused in particular by exports.

Concerns about the general economic development arise in particular because of the trade dispute with the USA and the lack of clarity about the course of Italy's policies with respect to Europe. Although it is still too early to assess the policies of the new government, it is worrying that a majority of the voters in a country that is one of the founding members of the European Economic Community no longer trust the policies of the European Union. This could certainly lead to negative effects on the real economy. The opinion of Holger Schmieding, chief economist of the private Berenberg Bank, is an example of what many from the banking sector believe. He expects a decline in economic growth from 2.4 % to 2.1 % in the eurozone, above all because of the two factors mentioned above.

In view of this challenge, the reform zeal of the European member states should not flag, especially now. One positive sign is that the budget deficit of the countries of the eurozone in 2017 fell significantly by 0.6 percentage points to 0.9 % of GDP. Debt also declined from 89.0 % to 86.7 % of GDP. To this extent, the threshold of 0.5 %

of GDP for debt as targeted in the fiscal package appears attainable. The deficit in the "South" – Italy, Spain, Portugal – however, is between 2 % and 3 %. There must be fears, especially in the current situation, that Italy, which has a very high national debt ratio of 132 % of GDP, will not exactly prove to be a model pupil. The bottom line of all these factors is that the economic upswing in the European Union might experience at least a damper.

After President Macron of France in particular presented his ideas for the renewal of the European Union, German Chancellor Merkel went on the offensive in an interview with the *Frankfurter Allgemeine Sonntagszeitung* of 3 June 2018. Two points stand out: new loan opportunities for countries in the eurozone that find themselves in trouble and a so-called investment budget in the lower tens of billions. While the European Stabilisation Mechanism (ESM) grants long-term loans, the Chancellor is thinking more in terms of five years. The objective of these measures is to promote economic convergence among the member states. Innovation capability is to be strengthened by actions related to additional structural policies. Countries that are lagging behind will have a higher priority. In view of the conflict with the United States in the trade dispute, it is more important than ever to stand shoulder to shoulder.

In the customs conflict, the European Union issued an ultimatum to the USA in June 2018. In the opinion of the European Union, the customs duties are a violation of international regulations. The USA justifies its protection of the steel and aluminium industries in terms of national security, but is also taking action against countries that are NATO partners of the USA. That is certainly not easy to explain. Canada's Premier Minister Trudeau calls the

USA's viewpoint nothing short of "insulting." Canada's soldiers fought side by side with America during the Second World War and in Afghanistan.

Energy Consumption

Data for the primary energy consumption in Europe and the world are always available only for the previous year so that this report can give information only about 2016. Primary energy consumption in the European Union in 2016, just as in the previous year, came to 2.3 billion TCE while economic growth in 2016 came to 2 %. The process of the decoupling of primary energy consumption and economic growth continued. There has been a shift in the shares represented by the various energy sources from the previous year for only two energy sources. Natural gas gained one percentage point, rising to 23 %, while the share of coal declined from 16 % in 2015 to 15 % in 2016. Shares of renewable energies (8 %), hydroelectric power (5 %), nuclear energy (12 %) and oil (37 %) remained constant. Hydroelectric power and renewable energies together have a share of 13 %. So fossil energy sources, including nuclear energy, that are together designated as conventional energy sources have a share of 87 % in the energy supply to the European Union.

Despite all the commitments of the European Union to international climate protection, we see a virtually static development in primary energy consumption. The share of renewable energy sources did not change in comparison with the previous year. The only observed change is the shunting aside of hard coal by another fossil energy source, natural gas.

The structure of primary energy consumption in the European Union differs significantly from the structure of global

primary energy consumption. The share of coal is only half as high as for the coverage of global energy consumption. Nevertheless, great efforts are being made in some countries of the European Union and by the European Commission to reduce even further the share of coal. A comparison of the European and global energy consumption, however, makes it clear that this cannot have more than a slight impact on a global scale. The share of renewable energy sources in the EU at 8 % is significantly higher than on the world stage (3 %). But even a further increase in the use of renewable energy sources in Germany would not change anything in the low one-digit global percentage.

Share of Coal in Primary Energy Consumption World and EU 28 2016

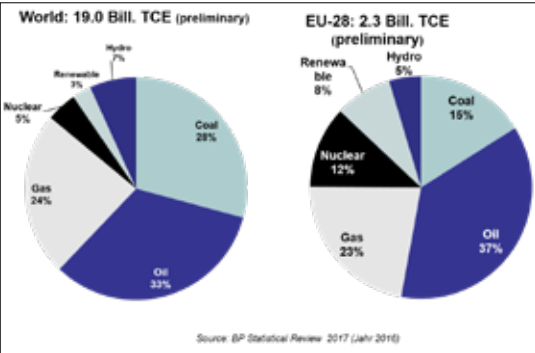


Figure HT 7

Hard Coal Market

European hard coal production was in sharp decline in 2017 as well, falling by 7.5 % from 87.2 million tonnes to 80.7 million tonnes. It decreased only slightly in Germany to 3.9 million tonnes (2017). At the end of the year, the two mines still in operation, Prosper-Haniel in Bottrop and Anthrazit in Ibbenbüren, will be closed. The Polish hard coal mining industry has completed an exceedingly difficult restructuring of mining companies and capacity adjustments in recent years. Production in 2017 fell further from 70.4 million tonnes to 65.5 million tonnes, a decrease by 7.0 %. In the Czech Republic, production declined from 6.8 million tonnes to 5.5 million tonnes. Contrary to the general trend, there was an increase in production from 1.7 million tonnes to 2.8 million tonnes in Spain.

Hard Coal Production in the EU			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
	(t=t)	(t=t)	(t=t)
Germany	7.0	4.1	3.9
Spain	3.0	1.7	2.8
Great Britain	9.0	4.2	3.0
Poland	72.0	70.4	65.5
Czech Republic	8.0	6.8	5.5
Total	99	87.2	80.7

Source: EURACOAL

HT-EU2

Table HT-EU3 shows total coal utilisation, including lignite, in the European Union. While steady imports and declining hard coal production were accompanied by a decline in hard coal utilisation, lignite production in 2017 rose so that the bottom line was an increase in coal utilisation. It must be noted here, however, that the EURA-

COAL data are collected in metric tonnes. The calorific values would also be required for a meaningful calculation of coal utilisation.

Hard Coal and Lignite Volume in the EU			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
	(t=t)	(t=t)	(t=t)
EU 28 Hard Coal Production	101	87	81
EU 27 Coal Imports/Domestic Trade	191	185	184
EU 27 Coke Imports/Domestic Trade	8	8	9
Hard Coal Utilisation	300	280	274
EU 28 Lignite	400	371	383
Total Coal Volume	700	652	656

Source: EURACOAL, Coke Market Report March 2018

HT-EU3

Despite the decline in imports since 2015, Germany is far and away the largest hard coal-importing country in Europe (Figure HT8). Great Britain relinquished its second place in the ranking of coal-importing countries to Italy in 2016. Spain is in second place for 2017. In this country, the quantities used fluctuate and are dependent on the availability of hydroelectric power and wind energy. It is followed by the Netherlands and France. An increase in hard coal imports in the European Union in 2016 and 2017 was recorded only in the Netherlands. Imports to that country rose from 12 million tonnes in 2015 to 16 million tonnes in 2017. Polish imports in 2017 also displayed an upward trend and reached 13 million tonnes. In all other countries, movements were in part in the other direction, but no clear trend was discernible.

Just as in Germany, steam coal dominates the imports in Italy, Great Britain, the Netherlands and Poland. Imports of coking coal and steam coal are approximately equal only in France.

The Seven Largest Import Countries of Steam and Coking Coal in the EU

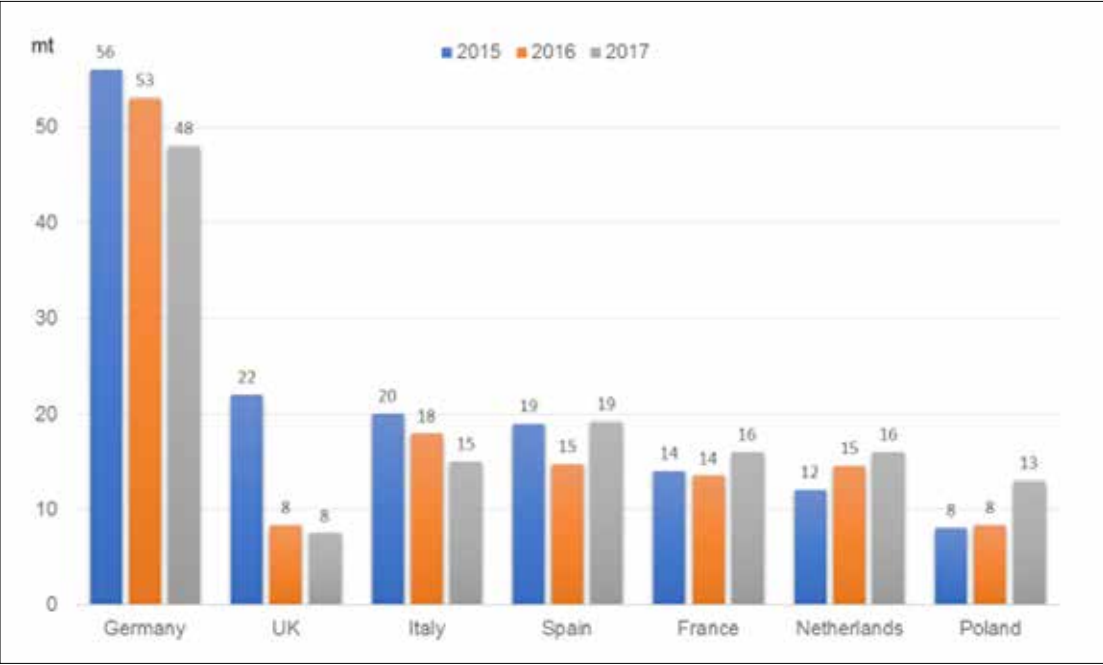


Figure HT8, Source: EURACOAL

Emissions Trading

The 23rd UN Climate Conference took place in Bonn from 6 to 17 November 2017. As always, it was a major media event. It was exploited by some governments and even by some companies for preachy appeals. The participants described the conference as progress. There was an agreement on financial issues, concretely, about a fund for adaptation of developing countries to the consequences of climate change from 1997. This shows that staying power is needed for projects like this in the UN. And there was an agreement on methodology. Reduction in carbon dioxide is to be measured according to a uniform standard in all countries. The related work is to be prepared in time for the next conference, which will take place in Katowice from 3 to 14 December 2018.

The European Union showed itself to be a model pupil; after years of dispute, there was an agreement on a reform of the emissions trading in December 2017. The European Emissions Trading System (ETS) is the primary instrument for climate protection in the European Union. Introduced in 2005, the ETS is a “cap and trade system”; this means that upper limits (caps) have been set and that the participating parties engage in trade with one another to sell excess emissions quantities or to buy quantities to make up shortfalls. The amount of CO₂ that may be emitted has been set for about 11,000 plants in the energy business and energy-intensive industry in all of Europe. About 45 % of all greenhouse gas emissions are currently covered. Since special attention has been directed at the inclusion of all coal-fired power plants in the system, the compatibility of electric power generation using hard coal and lignite with the targets set for European climate protection is assured.

The ETS and its effects are frequently misunderstood. It functions on the basis of the volume cap of the European Emission Allowances (EUA) – completely independently of whether the certificate price is high or low. Objections that the price signals are inadequate are often heard. In fact, however, the price says only whether climate protection costs a lot or little. The first section of the ETS Directive (2003/87/EC) emphasises that the system has been designed “to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner.” So it is desirable from the perspective of the directive’s legislators that climate protection in conjunction with a low CO₂ price be possible. Price manipulations are unnecessary and ultimately serve only to benefit competing energy sources that are too expensive.

Despite this, the ETS has been misused for years to steer prices instead of volumes. Capping the number of certificates was aimed at achieving a “politically desirable” price. Whether this instrument is now called “backloading” (introduced in 2014 to take 900 million certificates of the market) or “market stability reserves” (introduced in 2015) – it always represents an intervention in the ETS caps.

In December 2017, the European Parliament laid the foundation to create a clearly noticeable capping of certificates from 2022. The Council’s agreement was little more than a formality after the trilogue process. On 19 March 2018, the Directive (EU) 2018/410 was published in the Official Gazette. Beginning in 2021, the number of available certificates will be reduced by 2.2 % annually, thereby reducing the number of certificates by 28 % as of 2030.

In addition, the quantities that are to be allocated to the market stability reserves (MSR) are to be doubled by the end of 2023. The result will be a capping of the certificates at the beginning of the 2020s rather than at the end of the decade. ICIS, a price information service for trade with petrochemical products, energy and fertilisers headquartered in London, has conducted an analysis indicating that the price in emission trading would rise to € 33/t CO₂ by the end of the year. Subsequently, it would fall again to € 24/tonne CO₂ (Figure HT9). This prediction, however, is based on assumptions relating to the MSR. The forecast of the effects including the reduction of the linear factor as well is significantly more complex.

Even under the current conditions (i.e. a significantly lower level of the CO₂ price), emissions trading in 2017 in Germany demonstrated its performance capability: German ETS plants reduced their emissions by 3.4 %.

Seen in this setting, “the mere existence of the Coal Exit Commission is a vote of no confidence in the European emissions trading with which alone the set targets would probably be largely achieved. Unfortunately, politicians have the quirk of, first, generally not understanding emissions trading and, second, of not trusting it for this reason” (Daniel Wetzel (Welt) in: et 6/2018, p. 6). Daniel Wetzel continues: “... In fact, emissions trading is not only the cheapest climate protection instrument, it is also the only one that has so far been successful. Eighteen years of green power subsidisation have led to little improvement in the German CO₂ balance, 24 world climate conferences have not put the brakes on global emissions.

ICIS Forecast of the Price of the European Emission Allowances (EUA)



Figure HT9

Solely the European emission trading has achieved completely its targets for 2020 and has done so at low cost.”

The situation in the non-ETS area is significantly worse. In accordance with the effort sharing decision from 2009 (406/2009/EC), the burden for CO₂ reductions was distributed among the member states based on their economic performance. The contributions ranged from a reduction by 20 % to an increase by 20 %. On 14 May 2018, a new effort sharing regulation for the period from 2021 to 2030 was adopted. Pursuant to the climate resolutions of Paris, a bandwidth of between 0 and -40 % for 2013 was agreed (based on comparison with the level of 2005).

The aim of the new regulation is to reduce emissions outside of the ETS by 30 % in comparison with 2005 by the year 2030. Let us recall that the ETS provides for a reduction of 43 % by 2030. The targets diverge even more for 2020. The non-ETS area is to achieve a reduction of 10 % while within the ETS -21 % is demanded. In the long term, the primary burden of the adaptation will continue to be on the ETS area while the non-ETS area contributes 55 % of the emissions, but significantly less to the solution.

LCP-BREF

Another important topic at the European level in 2017 and 2018 was the LCP BREF, the standards for the best available techniques for large combustion plants. Experts from mining and energy industries are joined by so-called non-government organisations, including environmental protection organisations, during the consultation and decision-making process of the LCP BREF. The European

Commission used this body to bypass the professional world when proposing threshold values that go far beyond the state of technology and with which, in some cases, compliance is difficult or even impossible. In particular, the European lignite-fired power plants must fear difficulties. If the LCP BREF were to be translated into German law in their present form, this would presumably require substantial investments. There is no need to comment on what this would mean in a time when an exit from coal is under discussion in Germany. The consequences would be even more serious for Poland, where hard coal-fired power plants as well as lignite-fired power plants would be affected. It will surprise no one that the Polish government immediately filed a suit with the European Court of Justice. EURACOAL, the umbrella organisation of the lignite and hard coal industry, joined DEBRIV, the German federation of the lignite industry, and German companies in filing a suit on 7 November 2017.

The suit is based on three grounds. For one, the Commission concluded secondary agreements with two member states at the last minute to gain their support and to secure a majority on the decision-making committee. During this vote, it violated inter alia major formal requirements and superior law. The modification without notice of the draft of the resolution and the conduct of an immediate vote was in violation of a number of legal regulations and prevented a qualified discussion. Second, major formal regulations were violated. Finally, solely technical standards must be used for assessment when determining the so-called BREF conclusions, excluding consideration of any strictly political considerations. The suit argues that the Commission disregarded this require-

ment. A third reason for the suit refers to the previously mentioned technical requirements that are rather unrealistic and that, pursuant to Directive 2010/75/EU regarding industrial emissions (IED), the technical-economic availability of technologies must be reviewed as well. Since this did not happen, there would be an unreasonable burden on the affected plant operators. We will have to wait and see if this topic can be successfully returned from the political to the technical level. If not, there will be serious consequences for coal-fired power plants.

The European Commission is perfectly aware of the serious consequences its policies will have, especially for some Central and East European countries. This prompted the Commission to launch the “Coal Regions in Transition Platform” in Strasbourg on 11 December 2017. Among the attending dignitaries were Vice President Šefcovic, Commissioner Arias Cañete, Commissioner Cretú, Director-General Ristori and several ministers from member states of the Union. The European Commission would like to offer aid to the coal regions during restructuring and simultaneously displayed its openness to technical solutions that would make it possible to continue the use of coal if emission-free.

Capacity Markets

In December 2017, a highly negative decision that would have excluded hard coal-fired power plants from capacity markets was barely avoided. 550 g CO₂/kWh is a knock-out criterion for hard coal-fired power plants. The Commission itself is unable to explain exactly how it arrived at this threshold value, yet another reason to block it. On 18 December 2018, the European Council, following a long discussion relating to the Clean Energy Package, agreed on a joint position regarding emission standards for power plants that participate in capacity markets. As things stand at the moment, hard coal-fired power plants will have a foot in the door for a European capacity market, but for a limited time only. Existing power plants have a “reprieve” until 2030. New power plants must be in compliance with strict CO₂ emission standards from 2025. Emissions must be below 550 g CO₂/kWh, and hard coal-fired power plants, as mentioned above, cannot meet this standard. Open-cycle gas turbines will barely comply with this limit if they are operated at nominal load, but in the more realistic case of partial load operation, open-cycle gas turbines will fail to comply with this limit as well. Alternatively, there is a limit of an annual average of 700 kg CO₂ per installed kW. This

means, however, less than 1,000 operating hours for a conventional power plant.

The vote took place in the competent European Parliament Committee on Industry, Research and Energy (ITRE) on 21 February 2018. By majority vote, the Committee advocated making the 550 g CO₂/kWh limit binding five years after the entry into force of this decision – without the above-mentioned modification of the European Council. The European Parliament concurred with this viewpoint.

Initially, there was hope that a decision could be reached within the Bulgarian presidency during the first half of 2018. On 19 April 2018, an informal meeting of the EU energy ministers chaired by Bulgaria took place in Sofia. The agenda included the progress in the Clean Energy Package. It appears that it was not possible to complete work on this package during the first half of the year. The trilogue negotiations of the Council with the European Parliament (EP) and the EU Commission stalled, and it appears that the decision about CO₂ emission standards on capacity markets will not be made until the second half of the year. Hope remains that the rapporteur of the European Parliament will not be successful in this respect.

If, on the other hand, the rapporteur of the EP successfully asserts this position in the trilogue's compromise on the single market directive for electricity, it is possible that the participation of new hard coal-fired power plants will in future be highly restricted. This development would be detrimental to supply security and lead to a rising level in energy prices for the German industry.

Investments in combined cycle power plants in coming years would be made only where cogeneration of heat and power is used either in industry or for the generation of district heating. Whether investors could be found to invest in combined cycle power plants so that they can participate in capacity markets is a matter of conjecture. Combined cycle power plants would definitely be too expensive for operation solely in load cycling while open-cycle gas turbines would not be able to comply with the CO₂ emission standard in partial-load operation. If the indirect methane emissions along the entire length of the supply chain as determined in the Pöyry study of June 2016 for VDKi were taken into account, a decision in favour of open-cycle gas turbines would be strictly prohibited.

WORLD ECONOMIC SITUATION

World Production and World Trade

Real gross domestic product (GDP) worldwide grew by 3.7 % in 2017. The rates of growth vary widely. While the growth rate of real GDP in the OECD countries comes to 2.4 %, it is almost twice as high (4.6 %) in the non-OECD countries. Two countries caused this average to climb significantly. Real growth in 2017 in China was 6.9 % and in India 6.6 %. According to the OECD Interim Outlook of March 2018, India's growth will accelerate and it will develop into the country with the greatest economic growth. China's growth will tend to slow down while remaining at a high level. Brazil remains at the bottom of the list in 2017; its economy shrank by 3.5 % in 2016, but increased slightly by 1.0 % in 2017. The OECD expects a significant recovery of the economy in this country in 2018.

Growth in the USA in 2016 was no more than 1.5 %, but it recovered to 2.3 % in 2017, and the OECD forecast for 2018 is for a further rise to 2.9 %. While economic growth in the eurozone will remain above 2 %, Great Britain must steel itself for a continued slowdown in growth, caused in no small degree by the imminent Brexit. According to the OECD Interim Outlook of March 2018, Great Britain, along with Japan, will post growth of only 1.1 % in 2019 and bring up the rear in economic development.

After five years of comparatively slow growth in world trade, world trade in 2017 kept pace with industrial production and investments. Growth in trading volume in 2017 came to 5.2 %. World trade is a decisive source

Real Growth of Gross Domestic Product				
	2016	2017 ¹⁾	2018 ²⁾	2019 ²⁾
	Change from Previous Year in %			
World	3.1	3.7	3.9	3.9
OECD Countries	1.8	2.4	2.4	2.1
Non-OECD Countries	4.1	4.6	4.9	4.8
Eurozone (16 Countries)	1.8	2.5	2.3	2.1
Germany	1.9	2.5	2.4	2.2
France	1.1	2.0	2.2	1.9
Italy	1.1	1.5	1.5	1.3
Other OECD Countries				
Great Britain	1.8	1.7	1.3	1.1
Japan	1.0	1.7	1.5	1.1
Canada	1.5	3.0	2.2	2.0
South Korea	2.8	3.1	3.0	3.0
USA	1.5	2.3	2.9	2.8
Non-OECD Countries				
Brazil	-3.6	1.0	2.2	2.4
People's Republic of China	6.7	6.9	6.7	6.4
India	7.1	6.6	7.2	7.5
Russia	-0.2	1.5	1.8	1.5
1) Provisional, 2) Forecast Source: OECD Economic Outlook November 2017 and Interim Economic Outlook March 2018				

HT-W1

of global growth. For a long time, the rule of thumb was that annual trade volume grew twice as fast as the world economy.

In recent years, however, trade has barely kept pace with economic growth. Growth in world trade volume of 5.2 % along with economic growth of 3.6 % means that world trade is again moving in the direction of a healthy level.

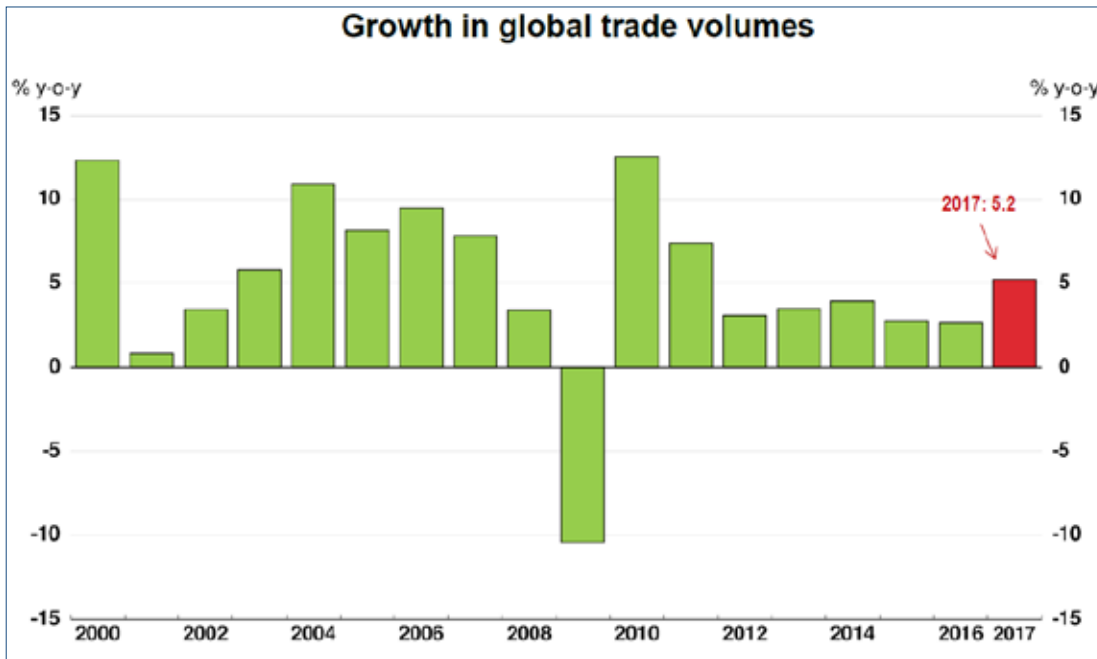


Figure HT10

The slight rise in inflation and interest rates are another indication of the normalisation of general economic conditions. Risks for the world economy arise from the high level of indebtedness and the high valuation of assets, however.

A year ago, there was already talk of the risks for the world economy that might arise from the “America first” policy of US President Trump. How dangerous could a “trade war” triggered by the USA become? During a meeting with the top managers from steel and aluminium companies in the White House on 1 March 2018, the president of the USA, Donald Trump, announced the levying of punitive tariffs

on steel and aluminium imports for the following week. They would be set at 25 % for steel and 10 % for aluminium. Shortly after the meeting, he announced on Twitter that Wilbur Ross, Secretary of Commerce, would speak to representatives of the European Union (EU) about the elimination of high tariffs and barriers applied by the EU against the USA. An escalation in the trade conflict between Europe and the USA became evident as early as last spring.

The German government described import duties on steel and aluminium as illegal. The USA, however, based its actions on a previously little-known article of the

General Agreement on Tariffs and Trade (GATT) that states that a member of the World Trade Organisation (WTO) cannot be prevented from taking action to protect its essential security interests. The production of armaments would otherwise no longer be possible, which would endanger “national security.”

Frans Timmermans, First Vice-President of the EU Commission, declared at a conference in Dillingen on 12 March 2018 that he could not see “any reasons” why “European steel would be a threat to American security.” The EU intends to initiate proceedings with the WTO.

The **direct** consequences of the planned American tariffs could be managed from the perspective of the steel industry. Only about 4 % of the American steel imports come from Germany. The **indirect** impact of American import duties on Europe and Germany would be a source of greater concern. The German steel industry fears that the European market would be “flooded” with cheap imported steel that can no longer be exported to the USA. The European steel industry is calling for protective measures and quotas for steel imports for certain countries or companies. If these quotas are exceeded, duties would be levied.

The EU decided on similar protective measures several years ago when cheap Chinese steel threatened to flood Europe. Today, imports from South Korea and Turkey as well as from India and Ukraine are especially threatening. China, on the other hand, is no longer the sole topic of conversation because this country has been attempting to reduce its capacities for several years for a number of reasons, including environmental policy concerns.

Astonishingly, it became known on 23 March 2018 that the USA intended to act exclusively against China. The American president made the following statement on the subject on Twitter: “As a candidate, I pledged that if elected I would use every lawful tool to combat unfair trade, protect American workers, and defend our national security. Today, we took another critical step to fulfill that commitment.” (@realDonaldTrump).

If anyone in Europe was thinking at this time that the cup had passed Europe by, that thought did not consider the fickleness of the American president. In the meantime, a tariff conflict has broken out between the United States and Europe. In June 2018, the European Union issued an ultimatum to the USA. As mentioned above, the USA justified its protection of the steel and aluminium industry on the basis of national security. The tariffs were also levied against countries that are NATO partners of the USA, however. That is certainly not easy to explain.

What has led to the trade conflicts of recent years in which China and the USA have played the leading role? Both of these countries want to protect their industries. They want to preserve their competencies and added-value chains. China, however, long ago understood that the solution to dominance of the complete added-value chain is in the improvement of its educational system. In this sense, “America first” should really mean that Americans throughout the entire population have the best educational system in the world at their disposal.

World Energy Consumption

According to the BP Statistical Review 2017, world energy consumption rose by 1.3 % to 19.0 billion TCE in 2016. While primary energy consumption in North America declined by 0.4 %, the decline in South and Central America was even greater, amounting to 1.0 %. Consumption in Europe/Eurasia rose slightly by 0.4 %. The growth of 2.1 % in the Asian-Pacific region was almost twice as great as the global average. This region's share in world energy consumption has now reached 42.0 %. This is as high as in North America (21.0 %) and Europe/Eurasia (21.6 %) combined. Energy consumption in the Asian-Pacific region is currently growing fastest on the Philippines (11.3 %), in Pakistan (7.6 %) and in Indonesia (5.9 %).

Development per energy source (HT-W2) shows that oil has a share of exactly one-third and is the unchallenged leader among energy sources. In 2016, oil consumption as well as natural gas consumption rose by 1.8 %. Coal

consumption, on the other hand, declined by 1.4 %. The share of coal covering consumption therefore fell from 29 % in 2015 to 28.1 % in 2016. Natural gas now has a share of 24.1 %.

Renewable energy sources (including Miscellaneous) had the strongest growth (+14.4 %), but they started at a very low level. Their share in coverage of consumption worldwide is only 3.2 %. Still, the share of hydroelectric power comes to 6.9 % so that the aggregate share is a good 10 %.

On 22 March 2018, the International Energy Agency published initial data on primary energy consumption of 2017 and CO₂ emissions. While CO₂ emissions have been almost constant over the last three years, CO₂ emissions from the utilisation of energy rose again in 2017 (+1.4 %). This is primarily a consequence of the rise in consumption of gas by 3 % and of oil by 1.6 % because these two energy sources have a combined share in energy consumption of almost 60 %. After two years of decline, worldwide coal consumption increased by 1 %.

Primary Energy Consumption in Billion TCE – Most Important Energy Sources –

	2013	2014	2015	2016	2016 / 2015 Change	Share in PEV 2016
Coal *	5.524	5.587	5.407	5.331	-1.4 %	28.1 %
Natural Gas	4.361	4.402	4.495	4.577	1.8 %	24.1 %
Oil	5.970	6.074	6.201	6.312	1.8 %	33.3 %
Nuclear Energy	0.805	0.822	0.832	0.846	1.6 %	4.5 %
Hydroelectric Power	1.231	1.263	1.262	1.300	3.1 %	6.9 %
Renewables a. M.	0.404	0.452	0.524	0.599	14.4 %	3.2 %
Total	18.295	18.601	18.721	18.966	1.3 %	100.0 %

* Hard coal and lignite

Source: BP, Statistical Review 2016

HT-W2

World Climate Policy

The Paris Climate Agreement is based on the voluntary realisation of national contributions to emissions reductions in the individual countries (national determined contributions, NDC). Each country makes its own decision about its contribution. In the estimate of the Intergovernmental Panel on Climate Change, the national climate protection schedules that have been submitted are not adequate to limit global warming to 1.5° C.

On 4 November 2016, the new international climate treaty entered into force for the start of the 22nd Conference of the Parties to the United Nations (UN) Framework Convention on Climate Change (COP22) held in Marrakesh from 7 to 18 November 2016. No fundamental resolutions concerning climate policy were adopted. In the Marrakesh "Action Proclamation," the 196 participating countries appealed to themselves to submit action plans that would ensure that the global temperature in this century would rise by less than 2° C in comparison with the pre-industrial age.

The 23rd United Nations Climate Conference (COP23) took place in Bonn from 6 to 17 November 2017. 22,000 government and non-government participants ("non-government organisations") met in Bonn with the objective of discussing means of limiting global warming to less than 2° C. In concrete terms, the consultations related to joint rules for monitoring, reporting and verification. To this extent, this UN Climate Conference had more of a technical character. The goal, however, was the preparation of a draft for a body of regulations that is to contain requirements for the national contributions for the reduction of emissions (NDCs). This body of regulations is scheduled to be adopted at the next conference (COP24) that will

be held in Katowice in 2018. In addition, there is to be a review and a tightening of the NDCs.

A draft for a body of regulations regarding the NDCs was presented in Bonn. This was a highly complex paper of broad scope, however, that in the opinion of the BDI is "confusing." It must first be turned into a "workable" document. For this reason, additional meetings will be necessary in May 2018 and possibly in autumn 2018 before the COP24 in Katowice.

In the so-called "Talanoa" dialogue, the adaptation of the NDCs is to be discussed in a transparent dialogue that will build trust because the NDCs that have been submitted at this time are not adequate to achieve the "less than 2° target" from Paris. It was possible for government and non-government participants to submit proposals between January 2018 and April 2018. A report from the Intergovernmental Panel on Climate Change on the consequences of global warming by 1.5° C will also be available. The BDI will be involved in this process in collaboration with Business Europe. The party states will take this information into consideration during their conduct of the "Talanoa" dialogue and will conclude talks at the COP24. This procedure is to be followed every five years.

The party countries were in disagreement regarding financial questions. Some of the countries have increased their allocations (Germany contributed € 50 million to the Adaptation Fund). But it was not possible in Bonn to answer the question of how the \$ 100 billion target for climate financing was to be reached.

In an official letter to the UN in summer 2017, the USA declared its withdrawal from the Paris Climate Agreement.

Formally, however, this withdrawal will not be effective until the end of 2019. The USA would be prepared to enter further negotiations on climate change provided the conditions are changed ("more favourable to labour, business and taxpayers"). It is also continuing to participate in these negotiations.

The USA had only a "minimal presence" in Bonn, however. In the opinion of the BDI, the inactivity of the American delegation re-opened the gap between industrialised countries and developing and emerging countries. China in particular has called previous agreements into question again. To this extent, the BDI is not alone in its concern that the old dichotomy between industrialised countries and the rest of the world was revived in Bonn. There will still be a lot to do in 2018 so that the Paris Agreement can truly become an example of success in international cooperation.

World Hard Coal Production

While world hard coal production of 7.1 billion tonnes in 2014 was practically unchanged in comparison with the previous year, it declined to 7.0 billion tonnes in 2015. Production in 2016 came to 6.8 billion tonnes. World production recovered in 2017 and rose by 2.7 % to 7.0 billion tonnes (rounded off), only 0.3 % below the value of 2015. So, 2015 was not a turning point – "peak coal" was not reached in 2015; it would be more correct to speak of a high plateau.

World Hard Coal Production

The major causes of this significant increase in the reporting period were the development in China (+70 million tonnes)

and the USA (+42 million tonnes). The same two countries had caused the decline in world hard coal production in 2016. Owing to contrary movement in these two countries, development of global hard coal production will again in 2017 be influenced to a major degree by special developments in these two producer countries; these developments are described in the relevant chapters of the Country Report. Irrespective of these circumstances, the rising trend for production in countries that play a major role for hard coal seaborne transport remains unbroken. Hard coal production also rose in Russia (+24 million tonnes), Indonesia (+13 million tonnes) and Australia (+7 million tonnes). Australia, Indonesia, Russia and the USA are major pillars of world coal trade.

The increase in production in these countries shows that there are still countries with a growing need for coal. While China and India produce substantial shares themselves (India 2017: +21 million tonnes) – nevertheless importing significant quantities from the world coal market as well – there are many ASEAN countries whose need for supplies to operate newly built hard coal-fired

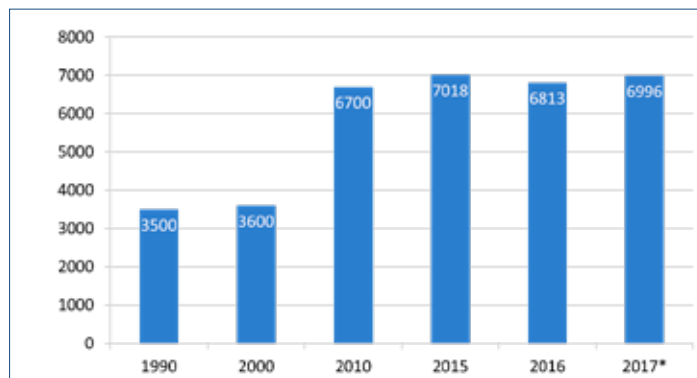


Figure HT11, Source: VDKi, own calculations; * 2017 provisional

power plants is triggering corresponding demand on the world coal market. This explains why an increase in production in the USA, Russia, Indonesia and Australia was possible and necessary.

Hard Coal Production of Important Countries in the Pacific Region in Million Tonnes					
Producing Countries	2014	2015	2016	2017	Change in % 2017 / 2016
China	3,598	3,545	3,450	3,520	2.0
India ¹⁾	612	626	639	660	3.3
Australia	441	421	433	440	1.6
Indonesia	389	413	402	415	3.2

¹⁾ Partly own estimates
Source: Various analyses

HT-W3

Change in Hard Coal Production in Specific Countries in 2017

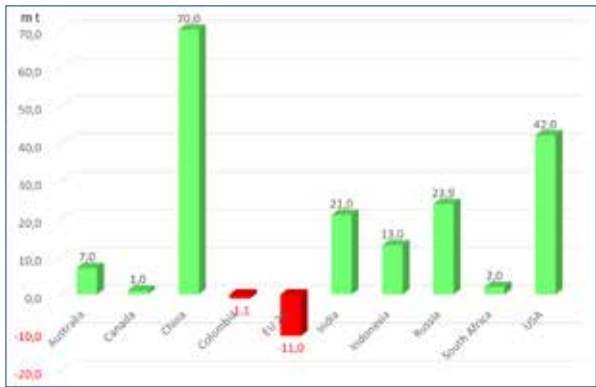


Figure HT12
Source: VDKi, own calculations; data for 2017 provisional

In relative terms, the rise was sharpest in the USA (6.4 %) and Russia (6.2 %). The sharpest decline was experienced by the European Union (12.4 %).

World Hard Coal Market

The world hard coal market increased again by 30 million tonnes (2.5 %) in 2017. While domestic trade fell slightly (1 %), seaborne trade rose by 31 million tonnes (2.8 %), a greater increase than the overall market. World trade in coal developed as shown below in 2017:

World Hard Coal Trade					
	2015	2016	2017	Change 2017 / 2016	
	Mill. t	Mill. t	Mill. t	Mill. t	%
Seaborne Trade	1,126	1,114	1,145	31	2.8
Domestic Trade	98	100	99	-1	-1.0
Total	1,224	1,214	1,244	30	2.5

Source: VDKi own analyses

HT-W4

There was a very slight decline in coking coal exports of one million tonnes (-0.4 %) in seaborne trade because of the virtually unchanged demand for coking coal. The steam coal market, on the other hand, rose strongly by 32 million tonnes (+3.8 %). Growth on the world coal market is driven by growth in the demand for steam coal. Seaborne trade of 1,145 million tonnes breaks down into 872 million tonnes of steam coal and 273 million tonnes of coking coal.

Seaborne Hard Coal World Trade					
	2015	2016	2017	Change 2017/2016	
	Mill. t	Mill. t	Mill. t	Mill. t	%
Steam Coal	856	840	872	32	3.8
Coking Coal	270	274	273	-1	-0.4
Total	1,126	1,114	1,145	31	2.8

Source: VDKi own analyses

HT-W5

Since world production and world trade advanced almost perfectly in step with each other by 2.7 % and 2.5 %, respectively, the share of world trade in production remained unchanged at 17.8 %.

World Production/World Trade					
Hard Coal	2015	2016	2017	Change	
	Mill. t	Mill. t	Mill. t	Mill. t	%
World Production	7.018	6.813	6.996	183	2.7
World Trade	1.224	1.214	1.244	30	2.5
Share of World Trade in Production	17.4 %	17.8 %	17.8 %		

Source: VDKi own analyses

HT-W6

Primary Trade Flows in Seaborne Trade with Hard Coal in 2017 in Million Tonnes

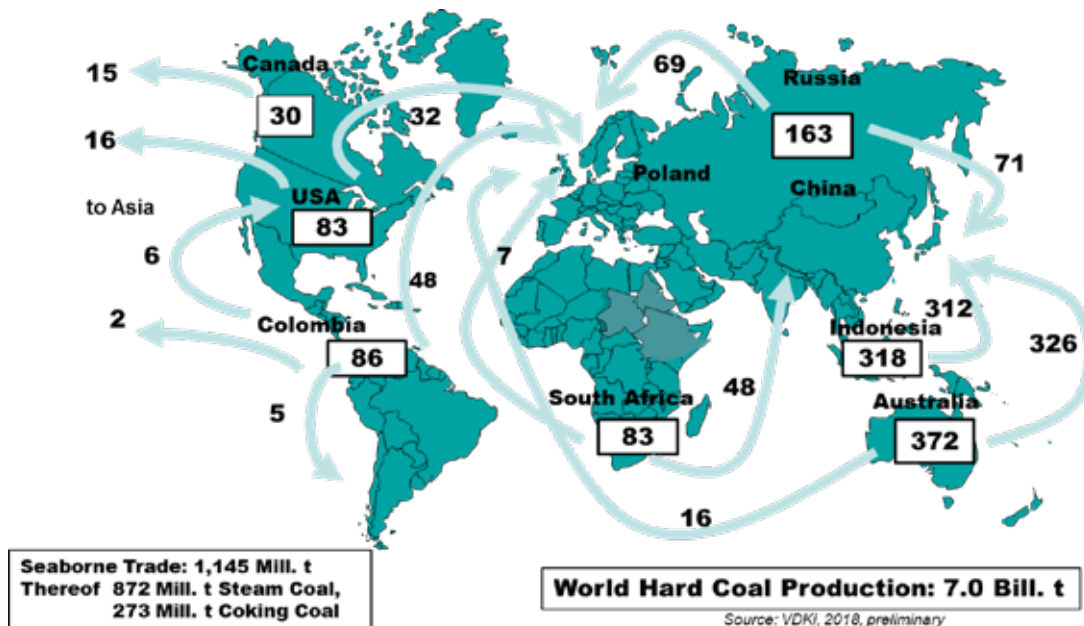


Figure HT13, Source: VDKi, own calculations; data for 2017 provisional

Figure HT13 shows the primary trade flows in seaborne trade. Indonesia ships almost its complete production (98 %) to Asia. Australia's seaborne trade is also very strongly directed to Asia (88 %). Thanks to their geographic locations, Russia, Canada and the USA can supply coal to both markets, and trade is shifting more and more toward Asia. In 2016, Colombia shipped more to Asia than to the USA. The situation reversed in 2017: while 2 million tonnes went to Asia, 6 million tonnes went to North America and 5 million tonnes to South America. Europe (including countries bordering the Mediterranean) continues to be Colombia's primary sales market. South Africa's competitive position for shipments to Asia is currently excellent. 58 % of the hard coal exports went to Asia and only 8 % to Europe.

Large Hard Coal Importing Countries/ Regions 2017 in Million Tonnes ¹⁾			
	Total	Steam Coal	Coking Coal
Asia, thereof	868	669	199
Japan	186	135	51
PR China ²⁾	161	107	54
India	197	149	48
South Korea	140	109	31
EU 28, thereof	184	140	43
Germany	49	36	13
¹⁾ Incl. anthracite ²⁾ Excl. lignite Source: Own calculations; seaborne traffic only			

HT-W7

The largest import countries are without exception found in the South-East Asia region which accounts for 83 % of seaborne transport of hard coal. India is the leader with 197 million tonnes, of which 149 million tonnes are steam coal and 48 million tonnes are coking coal. It is followed by Japan (186 million tonnes). The EU 28 (184 million tonnes) is ahead of South Korea (140 million tonnes). Within the EU, Germany, the largest member state and largest industrialised country, imports the most coal.

Australia defended its position as the largest coal exporter against Indonesia (318 million tonnes) in 2017 by posting 372 million tonnes (201 million tonnes of steam coal and 171 million tonnes of coking coal). Russia (163 million tonnes), Colombia (86 million tonnes) and South Africa (83 million tonnes) maintained their positions in the rankings. However, the USA (83 million tonnes) made a huge leap and is now level with South Africa.

World Market for Steam Coal

The demand for steam coal on the Atlantic market – which encompasses the east coasts of North, Central

and South America, Europe (including the countries bordering the Mediterranean) and the north and west coasts of Africa – rose in the Mediterranean region while declining in the EU in 2017.

Demand for steam coal on the Pacific market was dominated above all by China, India and some of the ASEAN countries. The demand from South Korea rose significantly from 98 million tonnes to 109 million tonnes, while Japan, the People’s Republic of China and India also posted increases. In total, demand for steam coal in Asia rose from 638 million tonnes to 669 million tonnes. Growth of 31 million tonnes (5 %) is primarily attributable to the ASEAN countries that are not listed separately.

The Largest Hard Coal Exporting Countries in 2017 in Million Tonnes ¹⁾			
	Total	Steam Coal	Coking Coal
Australia	372	201	171
Indonesia	318	318	0
Russia	163	140	23
Colombia	86	83	3
South Africa	83	83	0
USA	83	37	46
Canada	30	2	28
¹⁾ Seaborne only Source: VDKi own analyses			

HT-W8

Steam Coal Prices

Following the strong rise in steam coal prices to as much as between US\$90/t and US\$ 100/t as of the end of 2016 – depending on provenance – prices fell again in 2017 and had reached a price level of between US\$ 70/t and US\$ 80/t in the middle of the year. By the end of the year, prices had begun to rise again and reached the approx-

imate or a slightly higher level than at the beginning of the year.

In May 2018, the price for steam coal from the USA (FOB East Coast) was US\$ 79/t. At US\$80/t and US\$ 82/t, Colombian coal (FOB Puerto Bolivar) and Russian coal (free Baltic Sea coast), respectively, were slightly higher. Steam coal from South Africa (FOB Richards Bay) and Russian coal shipped to Asia (Vostochny) at US\$ 102/t and US\$ 101/t, respectively, were significantly more expensive. The highest price of US\$ 107/t was posted by the Chinese Bohai Rim (FOB Qinhuangdao).

Regulation in China continues to exercise substantial influence on the world market price level. This is discussed in greater detail in the Country Report. But market consolidation in the last two years and the rising demand in Asia have contributed to the high price level as well.

The arbitrage window for Colombian deliveries to India and to destinations in Asia closed a number of times in 2017. At the moment, the price difference again favours Colombia, but the decisive point is the ongoing development in freight rates. The latter point is also significant for the USA, which has established a firm position on the Asian market.

Development of FOB Steam Coal Prices in US\$/Tonne

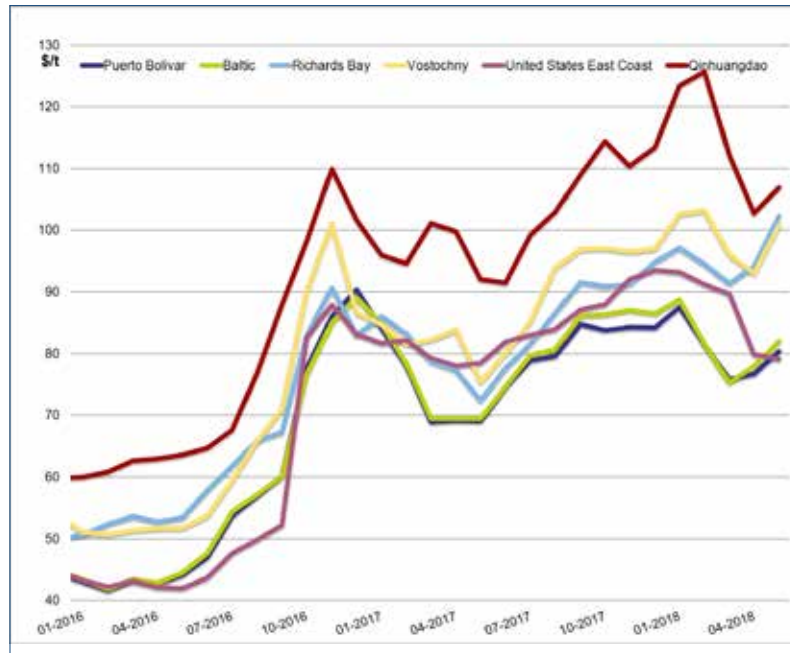


Figure HT14, Source: IHS

**World Crude Steel and
World Pig Iron Production**

The pig iron production decisive for the consumption of coking coal, PCI coal and coke increased slightly by 15 million tonnes from 1,159 million tonnes in 2016 to 1,174 million tonnes (+1.3 %) in 2017. Crude steel production rose significantly by 4.3 %.

Crude Steel and Pig Iron Production in the World				
	2015	2016	2017	Change 2017 / 2016
	Mill. t	Mill. t	Mill. t	%
Crude Steel	1,599	1,604	1,673	4.3
Pig Iron	1,159	1,159	1,174	1.3
Share of Pig Iron in Crude Steel	72.5 %	72.3 %	70.2 %	-2.9

Source: World Steel Association

HT-W9

Following a slight rise in the previous year, crude steel production in China rose by 2.9 %. China's pig iron production increased by 1.4 %, as in the previous year. China's share in the world market of crude steel production declined from 50.4 % to 49.7 % in 2017, but its share in world pig iron production of 60.5 % is still more than dominant.

Crude Steel and Pig Iron Production in China

	2015	2016	2017	Change 2017 / 2016
	Mill. t	Mill. t	Mill. t	in %
Crude Steel	799	808	832	2.9
Pig Iron	696	701	711	1.4
Share of Pig Iron in Crude Steel	87.1 %	86.7 %	85.5 %	-1.4
Share of Crude Steel Production in World Production	50.0 %	50.4 %	49.7 %	-1.4
Share of Pig Iron Production in World Production	60.0 %	60.4 %	60.5 %	0.2

Source: World Steel Association

HT-W10

Production from the world's largest steel-producing countries developed as shown below in 2017:

The 10 Largest Steel-producing Countries in the World				
Country	2015	2016	2017 ¹⁾	Change 2017 / 2016
	Mill. t	Mill. t	Mill. t	
China	804	808	832	2.9 %
Japan	105	105	105	-0.1 %
India	90	96	101	6.0 %
USA	79	78	82	4.0 %
Russia	71	71	71	0.8 %
South Korea	70	69	71	3.7 %
Germany	43	42	43	2.8 %
Turkey	32	33	38	13.1 %
Brazil	33	31	34	9.9 %
Ukraine	23	24		-6.4 %
Italy			24	3.0 %
Total of the 10 Largest	1,349	1,357	1,424	3.1 %
Total World	1,599	1,610	1,673	4.3 %

¹⁾ Provisional figures
Source: World Steel Association

HT-W11

Following a sharp drop in production in 2015, steel production recovered in 2016 and rose strongly by 4.3 % in 2017. The 10 largest steel-producing countries could not quite keep pace with this growth in 2017, posting +3.1 %.

Relative increase in 2017 was greatest in Turkey (+13.1 %), followed by Brazil (+9.9 %); in 2016, this country at -5.9 % was at the very bottom of the ranking. The Brazilian economy has been growing again since 2017 and, according to the OECD, will settle into a course of growth of over 2 %.

India (+6.0 %) – it will presumably overtake Japan (-0.1 %) next year to move into second place in the ranking – the USA (+4.0 %) and South Korea (+3.7 %) follow. Italy placed in the Top 10 with growth of 3.0 % while Ukraine's production fell by 6.4 %, causing it to drop out of this group.

Coking Coal Market

Market Share Seaborne World Coking Coal Market							
	2015		2016		2017		
	Mill. t %-Share		Mill. t %-Share		Mill. t %-Share		
Australia	184	69	189	69	171	64	
USA ¹⁾	38	14	34	13	46	17	
Canada ²⁾	27	10	27	10	28	10	
Russia	17	6	22	8	23	9	
Total	266	100	272	100	268	100	

¹⁾Excluding trade with Canada ²⁾Excluding trade with USA
Source: VDKi own analyses

HT-W12

While world pig iron production rose by 1.3 %, trade on the seaborne world coking coal market declined slightly (0.4 %). With the exception of Turkey, countries with growing steel production have their own coking coal deposits. There has been a further shift (in some cases a significant one) in the market shares of the various countries in the seaborne world coking coal market. Australia's seaborne coking coal exports and the market share rose by 5 percentage points to 64 %. The USA was able to increase its market share substantially and Canada maintained its position. Russia was able to increase its market share slightly.

World Coke Market

Coke production declined worldwide from 649 million tonnes to 633 million tonnes. World trade in coke, while at a significantly lower level, rose from 25 million tonnes to 26 million tonnes so that the share of world trade in world coke production increased from 3.9 % to 4.1 %. Chinese coke exports in 2017 amounted to 8.1 million tonnes (-21 %).

China is not only far and away the largest exporter of coke; it is also the largest coke producer. China produced 68 % of the world production (431 million tonnes) and reduced its coke production by 18 million tonnes (3.9 %) over 2016. In Europe, production of 38.7 million tonnes of coke was the same as in 2016.

The European coke market in 2017 had a volume of 9.0 million tonnes compared with 8.6 million tonnes in the previous year. Primary exporters of coke besides China are in particular Poland (5.8 million tonnes over 6.0 million tonnes in the previous year) and Russia with a major increase to 2.8 million tonnes (+25 %).

World Coke Market			
	2015	2016	2017 ¹⁾
	Mill. t	Mill. t	Mill. t
Total World Market	23	25	26
World Coke Production	650	649	633
% of World Coke Production	3.5	3.9	4.1

¹⁾ Provisional
Source: Own calculations

HT-W13

Coking Coal and Coke Prices

In November 2016, the price for Australian prime hard coking coal reached a high mark at US\$ 294.69/t. As of March 2017, the price fell significantly, but recovered to US\$ 232.10/t at the end of 2017. One major cause of this was Typhoon Debbie, which caused extensive damage in Queensland on 28 March 2017 and seriously impaired coking coal production. Some US providers took advantage of this situation to return to the market.

The coke prices FOB China displayed a similar trend as the prices for coking coal, but did not fluctuate as strongly. They rose from US\$280/t in January 2017 to US\$ 320/t in May 2018. During the same period, the CFR ARA price rose much more strongly from US\$ 320/t to US\$ 390/t and was about US\$ 40/t to US\$ 70/t above the Chinese price level.

Development of FOB Coking Coal Prices in US\$/Tonne

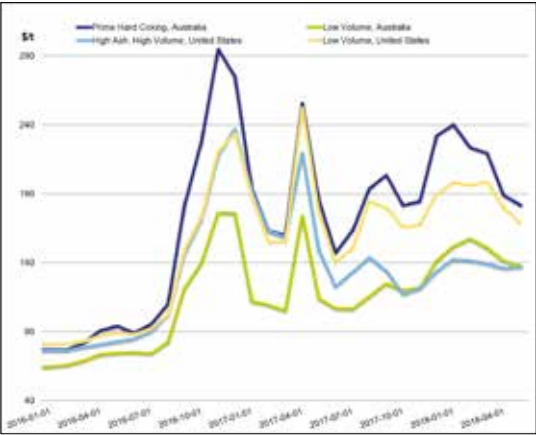


Figure HT15, Source: IHS

Freight Rates

The Baltic Dry Index (BDI) is calculated from the indices of the four ship groups Capesize, Panamax, Supramax and Handysize. The average value of 718 points at the beginning of 2016 represented the lowest value of the Baltic Dry Index since 1986. Since then, the index has recovered. It recovered significantly to 1,390 in June 2018, but is still far away from the high marks at the turn of the millennium.

Freight rates fundamentally mirror the distance from the loading port to the ARA ports, but other effects such as the availability of freight capacities and the general market situation play a role. Freight rates for the destinations Puerto Bolivar, Hampton Roads and Richards Bay were for a time very close, but then diverged again. Freight rates for Russian coal from Murmansk followed approx-

Sea Freight Rates (FOB) for Hard Coal to the ARA Ports

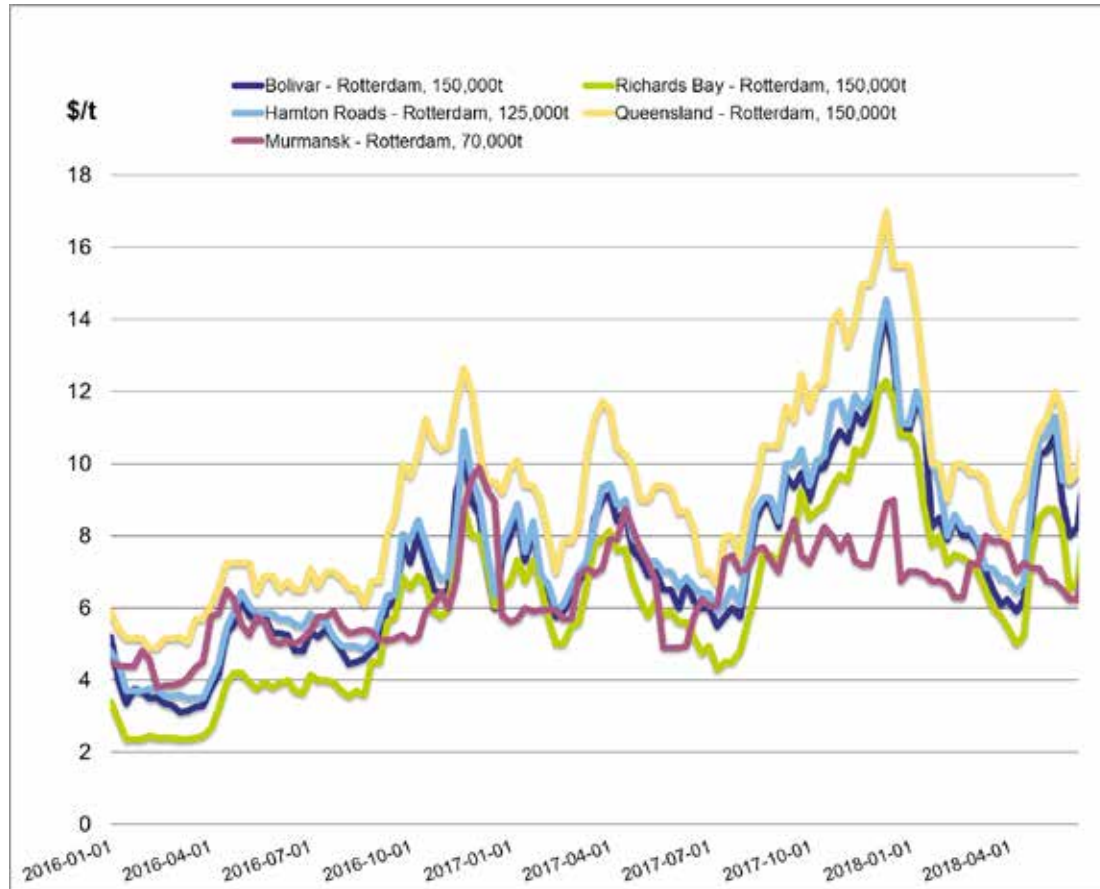


Figure HT16, Source: IHS

imately the general trend, but the fluctuations were far less severe. In June 2018, the freight rate for the route Murmansk-Rotterdam was US\$ 7.50/t. South Africa fol-

lowed at US\$ 8.24/t, Colombia at US\$ 10.00/t, the USA at US\$ 10.70/t and Australia at US\$ 11.25/t.

PROSPECTS

Real gross domestic product worldwide grew by 3.7 % in 2017. In its Interim Outlook of March 2018, the OECD predicted a slight increase in growth to 3.9 % up to 2019.

In analysing the growth trend, it is important to take a look at the development in the various regions of the world and the country ranking (HT-P1). The non-OECD countries India and the People’s Republic of China are at the top of the list. While growth in India will accelerate from 6.6 % in 2017 to 7.5 % in 2019, China, although at a high level, will decline slightly from 6.9 % in 2017 to 6.4 % in 2019. Growth of 4.6 % in the non-OECD countries in 2017 was substantially higher than the global average, and they will continue to lead until 2019. The OECD countries have below-average growth of 2.4 %, and the trend is pointing downward (2019: 2.1 %). South Korea is in the meantime slightly below average global growth and is approaching the more mature national economies. Global growth and with it world energy consumption are shaped above all by economic development in India, China and other countries in South-East Asia.

Initial data from the IEA on primary energy consumption in 2017 indicate that CO₂ emissions from the utilisation of energy rose again by 1.4 % in 2017 after three years at an almost constant level. This is primarily a consequence of the rise in consumption of gas by 3 % and of oil by 1.6 % because these two energy sources have a combined share in energy consumption of almost 60 %. After declining for two years, worldwide coal consumption, driven by economic growth in India and China, rose by 1 %.

Country Ranking by Growth in Gross Domestic Product				
	2016	2017 ¹⁾	2018 ²⁾	2019 ²⁾
	Changes from Previous Year in %			
India	7.1	6.6	7.2	7.5
People's Republic of China	6.7	6.9	6.7	6.4
Non-OECD-Countries	4.1	4.6	4.9	4.8
World	3.1	3.7	3.9	3.9
South Korea	2.8	3.1	3.0	3.0
USA	1.5	2.3	2.9	2.8
Brazil	-3.6	1.0	2.2	2.4
Germany	1.9	2.5	2.4	2.2
OECD Countries	1.8	2.4	2.4	2.1
Russia	-0.2	1.5	1.8	1.5
Japan	1.0	1.7	1.5	1.1
Great Britain	1.8	1.7	1.3	1.1
1) Provisional 2) Forecast				
Source: OECD Economic Outlook Novembre 2017 and Interim Economic Outlook March 2018				

HT-P1

Short-Term Development – 2018

In the estimation of Noble Resources, the world hard coal market will face a supply shortage in 2018. The tendencies observed in worldwide coal supply in the past year will presumably continue in 2018. The demand for steam coal, above all in the Asian-Pacific region, will most likely remain significantly higher than supply in view of today's prices. According to Rodrigo Echeverri, Head of Raw Materials Research at Noble Resources, the worldwide demand for hard coal in seaborne trade will presumably rise by 5 % in 2018 while supply will presumably rise by only 4 %. Price increases are to be expected so that the market will become balanced. The rise in demand in 2018 will come from the Asia-Pacific region, led by India and China.

Operating Production Costs (Cash Costs, FOB) for Steam Coal Traded on the World Market

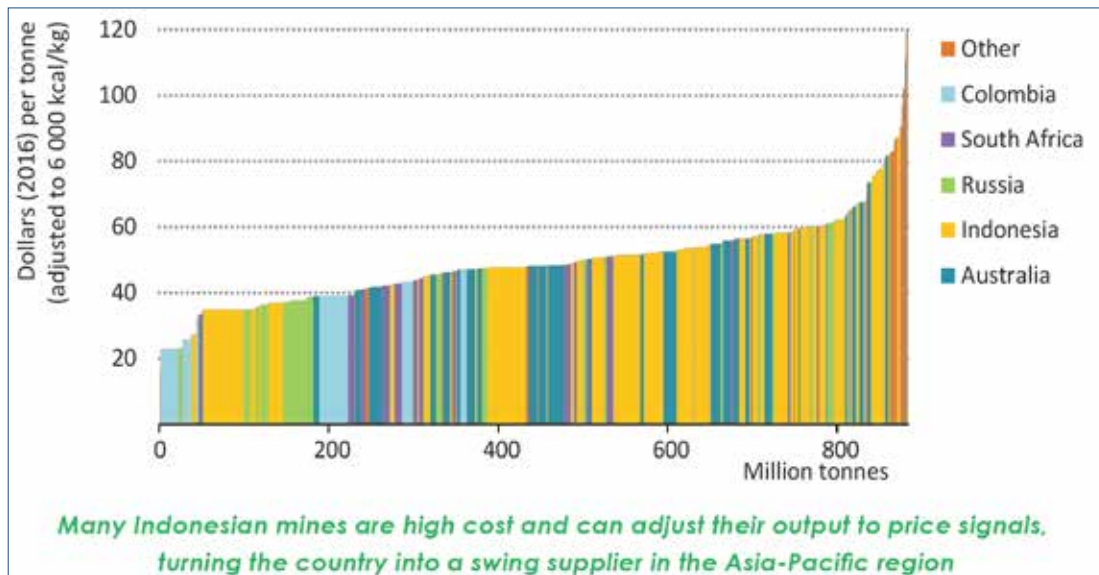


Figure HT17, Source: IEA, WEO 2017 and CRU Thermal Cost Model (2017)

Figure HT17 shows the operating production costs for coal traded on the world market. The curve can be interpreted as a market supply or marginal cost curve. It shows the direction in which the world market price for steam coal could go if the limit to capacity is reached. A detailed discussion about the situation in the producing countries can be seen in the Country Reports. Currently, we point out only that Indonesia currently plays the role of the swing supplier. The country can adequately play this role because the growth in domestic demand is not quite as high as anticipated by the Indonesian government because of delays in the construction of new power plants.

An increase in hard coal-fired power generation was

observed almost everywhere in Asia in 2017. According to IHS, electric power generation using coal rose in China and India, the two largest markets, by 6.3 % and 4.5 %, respectively, because the demand for electricity increased in a similar magnitude.

All the Asian countries included in Figure HT18, except for Thailand, showed noteworthy growth in electric power generation using coal. In most of the countries listed below, electric power generation using coal grew faster than total electric power generation. The increase is especially striking in Taiwan, which is a consequence of the losses in electric power generation in nuclear power plants. Taiwan's imports increased by 5 % to 68 million tonnes in 2017.

Electric power generation using coal increased significantly in Malaysia in 2017 because more coal-fired power plant capacities began operation. The Philippines are currently one of the fastest growing markets. Coal-fired power plants gained 6.6 % in 2017 and exceeded the overall electric power generation growth of 4.3 %.

cision that permitted the renewed operation of a nuclear reactor on 13 December 2017. The nuclear reactor Ikata 3 (output of 890 MW) received a permit last year to restart its operations. An appeals court, however, expressed reservations about the security of the plant in the event of another natural disaster. This decision is a setback for

Asian power trends (GWh)									
	Period	Total power	Total power	Coal-fired	Coal-fired	Total power	Coal-fired	Coal's share of gen mix	Coal's share of gen mix
		2017	2016	2017	2016	y-o-y change	y-o-y change	2017	2016
China	Jan-Dec	6,264,970	5,851,980	4,906,250	4,332,680	7.1%	6.3%	74%	74%
India	Jan-Dec	1,190,889	1,145,184	936,949	896,961	4.0%	4.5%	79%	76%
Japan	Jan-Sep	592,027	597,245	221,885	218,700	-0.9%	1.5%	37%	37%
Malaysia	Jan-Dec	123,054	122,225	65,736	63,345	0.7%	3.6%	53%	52%
Philippines*	Jan-Dec	71,922	68,935	34,370	32,240	4.3%	6.6%	48%	47%
S. Korea	Jan-Dec	546,254	540,441	243,009	234,851	1.1%	3.5%	44%	43%
Taiwan	Jan-Dec	230,201	226,752	90,161	83,009	1.5%	8.6%	39%	37%
Thailand	Jan-Nov	186,094	184,162	33,087	34,109	1.0%	-3.0%	18%	19%
Vietnam	Jan-Dec	174,700	160,700	NA	NA	8.7%	NA	NA	NA

* Data is just for the two main grids Source: IHS Markit

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Figure HT18

Several coal-fired power plants began operation in South Korea in 2017. There as well, growth in electric power generation using coal was greater than that of overall electric power generation. Imports of steam coal in the amount of 109 million tonnes in 2017 represented growth of 17 % over the previous year. Despite the continuing resistance to coal, the steam coal imports increased because the capacities of the new power plants are higher than those of the power plants that have been shut down. In Japan, electric power generation using coal rose by 1.5 % even though the demand for electricity was in decline. The uncertainties about further development of nuclear power in this country, however, makes it more difficult to forecast further development. The construction of new coal-fired power plants could be supported by a recent court decision. A Japanese court reversed a de-

the Japanese nuclear power industry and the efforts of Prime Minister Shinzo Abe to recommence operations of many of the nuclear power plants in the country. Since the Fukushima disaster in 2011, electric power generation using hard coal in Japan has had a share of about 35 %.

Electric power generation based on imported hard coal is moving in an upward direction in other regions of the world as well, however. Turkish steam coal imports reached a record high in 2017. Imports last year rose by 9 % to post a record mark of 33 million tonnes. In December, imports rose by 47 % in comparison with the same month of the previous year. Both domestic coal production and electric power generation from coal-fired power plants and even electric power generation using import coal increased by 11 % in Turkey in 2017.

Middle-Term Development – to 2022

The report “Coal 2017 – Analysis and Forecasts to 2022” from the International Energy Agency (IEA), previously known as the “Medium-Term Coal Market Report,” is also oriented to the forecast assumptions of the OECD presented above. As always, annual data are reported for the previous year, in this case, for the year 2016. This is why the report is still labouring under the impression that there was a turning point in coal production and world trade in 2015 while the VDKi figures for 2017 show that they closely approached the level of 2015. The IEA itself, however, appears to expect a “rebound” in demand in 2017 led by China, India and the USA. This was expressed in any case by Keisuke Sadamori, Director Energy Markets and Security, during a talk given in December 2017. At the same time, he asked this question: “Is this rebound a blip or a new trend?”

The IEA looks ahead to the year 2022 in its report. During this period, coal will remain an important energy source in electric power generation. Electric power generation using coal will increase by 1.2 % annually between 2016 and 2022. Its share in electric power generation will nevertheless decline from 41 % in 2013 to 36 % in 2022, thus reaching the lowest value since the IEA began reporting. This historical comparison by the IEA is astonishing in so far as the IEA in its last Medium-Term Coal Market Report 2016 forecast a share of coal for 2021 of 36 % as well (although without a corresponding reference). This result can also be interpreted to mean that the forecast for coal has not worsened since the previous year.

The share of coal in primary energy consumption will decrease from 27 % in 2016 to 26 % in 2022. In the estimation of the IEA, the demand for coal in Europe, Can-

ada and the USA will decline between now and 2022. In its report, it gives special attention to the situation in Poland and Germany. Drivers for demand, on the other hand, will be India, South-East Asia and several smaller Asian countries. For the bottom line, the IEA estimates that demand for coal in 2022 will at most be slightly below today's level. These are not evil tidings.

In looking back at price development, the IEA emphasises above all the role of the Chinese government and its agencies. On the demand side, the IEA sees great uncertainties for future price development for China, India, South Korea and Japan. It comes to the conclusion: “Uncertainty is the main certainty for coal trade.” In the past, Japan, South Korea, Taiwan and other smaller countries would have been able to compensate in part for the fluctuations from China and India. That is no longer possible. The South Korean government, for instance, is trying to reduce the share of coal in electric power generation, although new hard coal-fired power plants with an output of 5 GW have just begun operation and 4 GW are on the drawing board. There is “growing social opposition” to coal in Taiwan. This prompts the IEA to see a decline in trading volume for the world seaborne traffic by 2022.

On the supply side, the IEA sees “disciplined behaviour” of the providers. The dominant estimation is that the high price level of the moment has more to do with the Chinese government and less with signals of shortage. This does not foster the confidence of investors in the market. Consequently, investments in coal projects can be expected only in China and India. The IEA believes that India can cover a major part of its additional demand itself, so it is assuming that steam coal imports to India will decrease. As far as coking coal is concerned, however,

imports will rise through 2022 because India cannot offer fully the quantities of the required grades itself.

For the USA, the IEA expects the current level of coal production to be maintained. Demand, however, will fall by 1 % annually through 2022. The significance of exports for the USA has become more important as a result. Despite the easing of certain regulatory restrictions and cost reductions, the IEA continues to classify the USA as a “swing supplier” and sees its market position in world seaborne trade again at risk as coal prices decline. The IEA classifies the market position of Russia, Colombia and South Africa as more favourable while Indonesia might lose market shares.

At the end of the report, the IEA points out the significance of carbon capture, utilisation and storage (CCUS): “Indeed, without CCUS, coal use will be seriously constrained in the future.” All in all, the current report has a certain tendency to pessimism. It appears to overstate the risks while understating the opportunities. Even though there might be negative political decisions against coal-fired power plants in Europe and the demand for coal in the USA will most likely continue to decline, the development of power plant capacities in Asia and South-East Asia will presumably continue to support demand. The restructuring of the Chinese coal mining industry involves not only the closing of small and unsafe mines; large and highly productive new mines are being added. The only unanswered question concerns the role that import coal will play in the long run. In seeking an answer to this question, attention must go beyond the demand of the power plants to include the heating market. The Chinese government pursued ambitious goals in this sector

in 2017. As of this time, the conversion to LNG has not advanced to the satisfaction of the Chinese government. And this has caused the counter-reaction described in the Country Report.

According to the “Shell LNG Outlook 2018,” the demand for LNG rose by 29 million tonnes to 293 million tonnes in 2017. “Based on the current expectations for the development of demand,” Shell sees “potential supply bottlenecks in the middle of the 2020s” if capacities are not expanded soon. China, which is already the second-largest import country, is competing in the region with Japan, the Number One, and South Korea, the Number Three, for LNG imports.

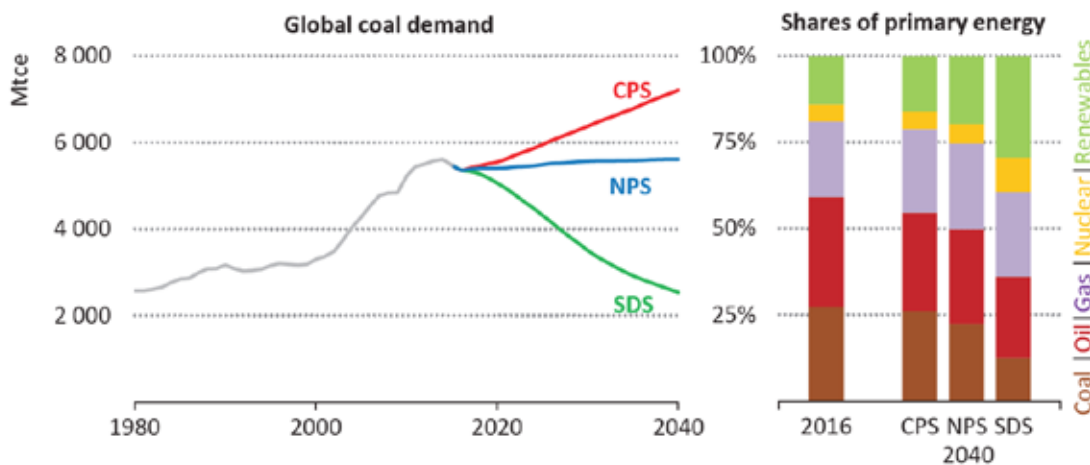
Long-Term Development – to 2040

The International Energy Agency (IEA) published the World Energy Outlook (WEO) 2017 in December 2017. The New Policies Scenario (NPS) is the guiding scenario of the IEA. It takes into consideration the policies and actions that had been initiated or at least announced as of the middle of 2017. The climate commitments submitted before the Paris Climate Agreement are considered in this scenario. The Sustainable Development Scenario (SDS) sets even stricter standards for sustainable development. The share of energy sources with low or no CO₂ emissions in the global energy mix shown in this scenario comes to 40 % in 2040. In this scenario, it is assumed that first the demand for coal and then the demand for oil will decline sharply. This scenario expects a share of 60 % in electric power generation for low-carbon energy sources in 2040. In combination with a 15 % share of nuclear energy and power generation with CCS of 6 %, the CO₂ emissions in this scenario would be reduced sharply.

The IEA assumes that worldwide GDP will rise by an average of 3.4 % annually up to 2040. This is a little less than the growth rate of global GDP of 3.9 % for 2019. Until 2040, growth in the developing and emerging countries will rise significantly more strongly than in the OECD countries (see HT-P1 above). One important cause: the guiding scenario (NPS) sees world population increasing from 7.4 billion today to 9.0 billion in 2040. The greatest push in the demand for energy is expected from India.

India's consumption will increase by about 30 % by 2040. This country's share of global primary energy consumption will then be 11 %. This figure is still lower than the expected population share of 18 % in 2040. In the NPS, world energy demand will grow more slowly than in the past, but will nevertheless increase by 30 % as of 2040. The magnitude of this growth corresponds to the addition of a second China and a second India at their current level of energy demand.

Demand for Coal and Share of Coal in World Energy Consumption per Scenario



The stringency of environmental policy determines the future fortunes of the coal market

Note: CPS = Current Policies Scenario; NPS = New Policies Scenario; SDS = Sustainable Development Scenario.

Figure HT 19, Source: IEA, WEO 2017

Figure HT20 shows the regions of the world where energy consumption will grow in the coming decades. While most of the talk in recent years centred above all on China, the IEA now reports on growth in energy consumption in India, South-East Asia, the Middle East and Africa and, in no small degree, in Central and South America. In

view of the (from a global perspective) still low share of renewable energy sources in covering energy demand, fossil energy sources will continue to play a major role until 2040. Renewable energy sources, however, will grow enormously. The International Energy Agency has come up with the following projections:

IEA World Energy Outlook 2017, Change in Energy Demand 2016 to 2040 (Mtoe)



Old ways of understanding the world of energy are losing value as countries change roles: the Middle East is fast becoming a major energy consumer & the United States a major exporter

Figure HT20, Source: Presentation of the IEA World Energy Outlook 2017

IEA World Energy Outlook 2017, Change in Energy Demand 1990 to 2040 per Energy Source (Mtoe)

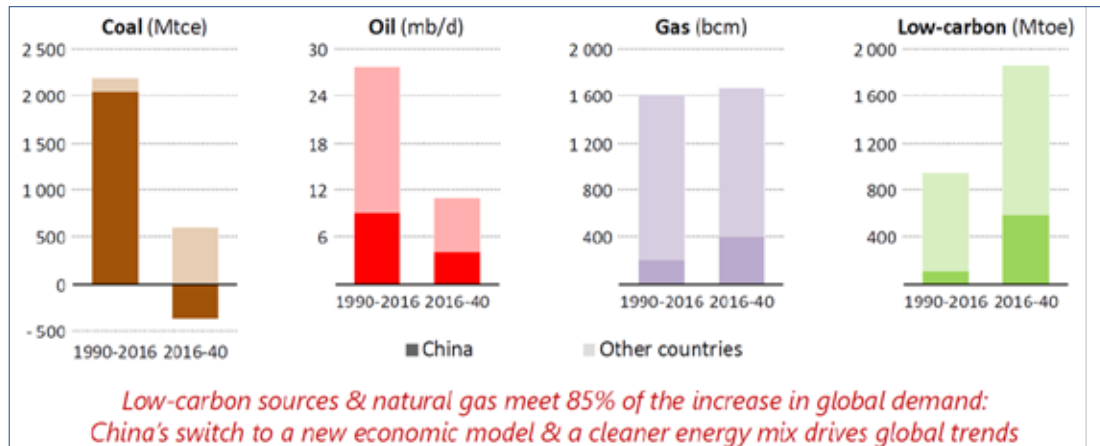


Figure HT21, Source: Presentation of the IEA World Energy Outlook 2017

While in the period from 1990 to 2016 coal had the largest share in covering growth in demand, this role will in future – i.e. until 2040 – be taken over by renewable energy sources and natural gas, according to the IEA's guiding scenario NPS. Even though coal's growth contribution will decline, consumption will still continue to increase. Figure HT21 shows why this is true. The part of energy demand shown in the dark colours is China's share. On the one hand, it is assumed that there will be a significant decline in the use of coal and, on the other, a rise in the consumption of oil and natural gas and renewable energy sources in China up to 2040. The decline in Chinese coal consumption will be more than compensated by the aforementioned growing world regions.

In the guiding scenario NPS 2040, natural gas will cover one-quarter of worldwide energy consumption and will be second only to oil as an energy source. Developing countries are expected to be the source of 80 % of this growth in consumption. China, India and other Asian countries, which often do not have any natural gas infrastructure available, will be important new demand regions. LNG will consequently become increasingly significant. The International Energy Agency critically points out, however, that the energy source natural gas must do its "homework". Greater efforts must be made to reduce the methane leakages in oil and gas production along the entire added-value chain. According to the IEA, recovering these methane emissions would have the same effect

on the temperature increase in 2100 as the shutdown of all coal-fired power plants currently in operation in China.

The renewable energy sources will cover 40 % of the additional demand for energy up to 2040. Even for a coal country such as India, the IEA expects the share of coal in electric power generation to decrease from three-fourths in 2016 to less than half in 2040.

It will, however, be the other countries and regions mentioned above – India, South-East Asia, Middle East, Africa and Central and South America – that will drive coal consumption upwards until 2040, and in these countries more energy consumption also means more coal.

This supports the viewpoint that this is no time to speak about peak coal. Quite the contrary – coal consumption has reached a high plateau globally. Our argumentation is not simply calculated optimism. In the chapter on climate policy, we described that there are no global reduction targets that are binding under international law, but only nationally determined reduction contributions (NDC). There are currently no visible indications that these plans are being implemented with any determination. It is correct that a number of countries declared their desire to exit coal following the Paris Climate Conference. The relative significance of these exit declarations becomes obvious, however, when we consider that countries such as Denmark, Finland or France require only a very small part of the global hard coal supply. Even a German exit from coal would have only marginal impact on a global scale. The

large consumption regions have absolutely no intention of exiting coal. This concerns climate protection activists. In an article on 7 February 2018, the Washington Post referred to the Mercator Research Institute on Global Commons and Climate Change in Berlin and clearly pointed out that the global climate targets will be almost impossible to achieve with the planned construction of additional coal-fired power plants. This also confirmed the ambitious programmes for the expansion of power plants in world regions with dynamic economic growth, a development that has been regularly denied by environmental protection organisations so that they could point an accusing finger at coal-fired power plants in Europe. The studies by the Mercator Institute show, for example, that countries such as Turkey, Vietnam and Indonesia have extensive plans for construction of new power plants. India, China, Turkey, Vietnam and Indonesia are the countries in which almost three-fourths of the coal-fired power plants that are planned or under construction are located. The primary message of this study is that the 2° target is no longer achievable if these plants are actually built. At the same time, however, it also shows that many development plans of developing and emerging countries continue to be based on coal because this is the most promising path for the countries to catch up to industrialised countries.

Global CO₂ emissions related to energy will rise from 32 billion tonnes in 2014 to 35.7 billion tonnes in 2040, according to the guiding scenario NPS. This growth is attributable to the non-OECD countries and will balance out the declines in other regions, especially in Europe.

CORPORATE SOCIAL RESPONSIBILITY –

Statement of Principles of the VDKi

As far as is possible for the Association, the VDKi assumes responsibility for social, ecological and ethical principles. The Association supports its members in their efforts to achieve a high level of corporate social responsibility (CSR) in all their business activities. The VDKi and its members expect all the parties participating in the hard coal supply chain (hereinafter known as the suppliers) to observe and support the following basic principles as the fundamental ground rules for a business relationship based on trust. The VDKi therefore adopted a resolution recognising the following basic principles for responsible, social, ethical and environmentally sound actions in the hard coal supply chain during its Members' Assembly on 25 June 2015:

Basic Principles

We expect the compliance of all suppliers with any and all relevant laws and regulations of the country in which they operate. Moreover, we expect suppliers to orient their business to at least one of the following three international standards and guidelines:

- The Ten Principles of the United Nations Global Compact
- The OECD Guidelines for Multinational Enterprises
- The IFC Performance Standards on Environmental and Social Sustainability

We monitor the further development of standards specific to mining and coal and maintain an ongoing dialogue with our suppliers so that we can support them in the fulfilment of their social responsibility.

We expect our suppliers to advocate sustainable business activities within the full scope of their responsibilities and interests and not to limit their efforts to establishing sustainable business models for themselves alone. In this sense, we expect our suppliers to communicate the basic principles declared here as their expectation of their own suppliers and market partners.

We are open for dialogue with all of the relevant stakeholders who wish to contribute to responsible corporate action in the hard coal supply chain in the sense of a continuous improvement process.

We expect our suppliers to commit to the basic values of the following four areas set forth in the UN Global Compact and to strive to implement these principles in practice.

1. Human Rights

We expect all suppliers to support and respect the United Nations Universal Declaration of Human Rights and to ensure that they themselves are not party to any violations of human rights. The reference framework for responsible handling of human rights is established by the “UN Guiding Principles on Business and Human Rights” and any national action plans based on these principles for the relevant region.

2. Labour Standards

We expect the compliance of all of our suppliers with the laws and regulations of their country, including those related to occupational safety and health protection on the job.

Moreover, we expect compliance with the following basic principles and related core labour standards of the International Labour Organisation (ILO):

- Freedom of association and the right to collective bargaining
- Abolition of forced labour
- Elimination of child labour
- Prohibition of discrimination in employment and profession

3. Environmental Protection

We expect all of our suppliers to ensure their responsible treatment of the environment and to work continuously on reducing the environmental impact of their activities on water, land, in the air and on biodiversity. Moreover, we expect them to encourage the development and distribution of technologies to protect the environment and to use natural resources efficiently.

4. Ethical Business Standards

We expect all of our suppliers to comply with a high level of business ethics and to combat every form of corruption or bribery, including fraud and extortion.

The reference frame for ethical business standards is found in the UN Convention Against Corruption.

The VDKi has set up a working group for the purpose of incorporating the subject of CSR as a fixed element of the Association's policies. CSR is now a regular point on the agenda of the Management Board's meetings as well. The VDKi is open to the sharing of experience with all groups and associations interested in CSR.

COUNTRY REPORTS

AUSTRALIA

General



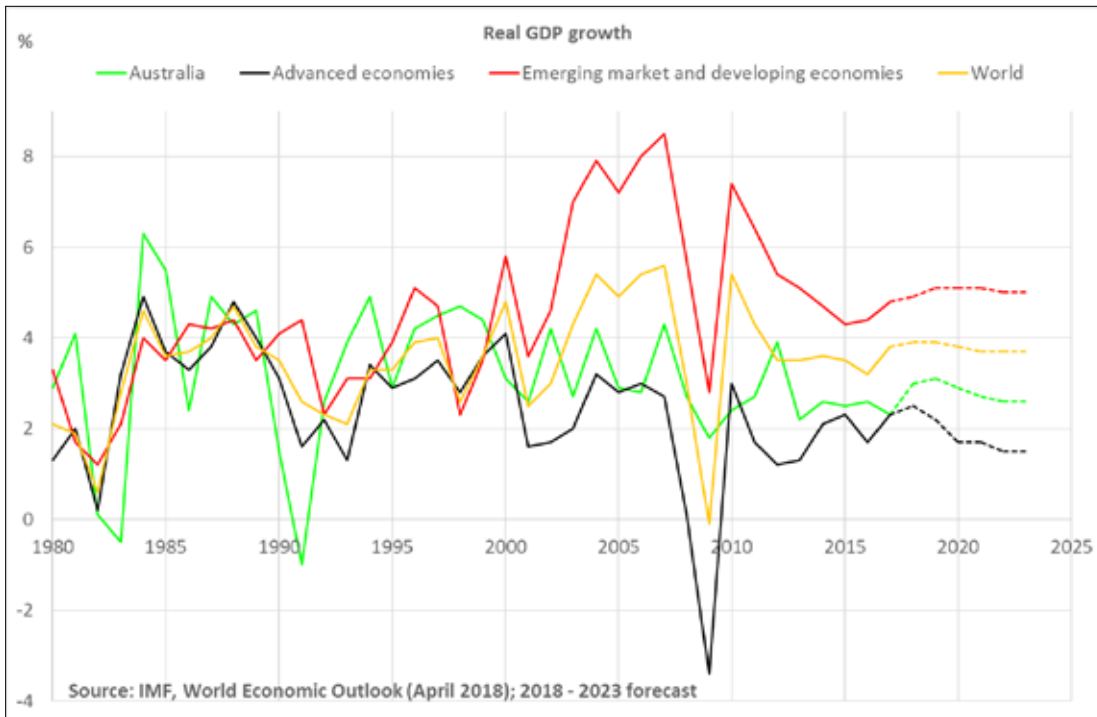
The Australian economy has been growing continuously for 27 years. According to the International Monetary Fund (IMF), gross domestic product (GDP) grew by 2.3 % in real terms in 2017 (World Economic Outlook, WEO, April 2018). An increase of 3.0 % is projected for 2018. This would put per capita GDP at US\$ 59,660, substantially above the world average of US\$ 11,730. Parallel to this strong economic growth, however, is rising inflation. According to the IMF, a rise in the consumer price index by 1.9 % is expected, following 1.28 % in 2016, the lowest mark in recent years. Foreign trade development remains highly positive. In comparison with 2016, it rose by 21 % FOB to US\$ 232.

Real Growth in Gross Domestic Product

Germany Trade and Invest (GTAI) has determined the country's export quota to be 15 %. Raw materials make up 32 % of Australia's exports, whereby coal accounts for half. Direct foreign investments rose from US\$ 19 billion in 2015 to US\$ 48 billion in 2016. There are also negative economic developments, however; in 11 of the last 12 quarters, the manufacturing sector has shrunk. Its share in GDP has been falling for many years and is moving in the direction of 5 %. Australia has declared its goal of becoming Asia's "bread basket" as compensation for this development. The free trade agreements with countries such as the People's Republic of China, Japan or South Korea are important steps in this direction.

In the estimation of the Chief Economist in the Australian "Department of Industry, Innovation and Science", the revenues from raw material exports in 2017–2018 will presumably reach an all-time high of US\$ 230 billion. The higher prices for iron ore and coking coal were key factors here, while in the case of LNG the higher export volume made an impact. From 2019 on, a stabilisation of Australian raw material production at a high level is expected. LNG makes the greatest contribution to the growth of export revenues. It is followed by coking coal and steam coal.

In the estimation of the Australian Department of Industry, Innovation and Science, the USA and the ASEAN countries above all will play a major role in supporting global economic growth. In contrast, the battle against emissions and the taming of financial risks will lead to declines in growth for China.



Production

The eastern parts of the country, New South Wales (NSW) and Queensland (QLD), are the sources of virtually all of Australia's hard coal. Most of the coking coal comes from QLD, while steam coal comes primarily from NSW. Smaller quantities of hard coal were produced in Western and South Australia as well as Tasmania (12 million tonnes in total) in 2017, but they remained exclusively on the domestic market. About 80 % of the total usable production comes from opencast pits, 20 % from underground mines. Total coal production rose (after a

Usable Production of the Major Production States of Australia

	2015	2016	2017
	Mill. t	Mill. t	Mill. t
New South Wales (NSW)	191	195	192
Queensland (QLD)	221	230	236
Total NSW/QLD	412	425	428
Rest of Australia	9	8	12
Total	421	433	440

Source: Australian Department of Industry, Innovation and Science, Office of the Chief Economist/MCR

LB-TI

decline in the previous year) from 433 million tonnes to 440 million tonnes, an increase of 1.6 %.

The price level for metallurgical coal remains high. Ongoing supply risks from weather conditions and the strong demand from Asia is keeping the price level high. Prices for steam coal are also at a high level. There was a significant spot price increase during the fourth quarter in particular, e.g. to between US\$ 95/t and just under US\$ 100/t for steam coal FOB Newcastle. The major reason for this related to procurement activities for the replenishment of stockpiles and some supply disruptions caused by weather. The high demand from Asia will also more than compensate the decline in demand from OECD countries.

The Australian Department of Industry, Innovation and Science regularly issues information about the status of the projects in coal mining in the publication *Resources and Energy Major Projects* and distinguishes here between announced projects, feasibility studies, projects in progress and completed projects. The following projects were listed in the publication of December 2017:

- 14 coal projects were announced: 4 in NSW, 10 in QLD. The estimated investment volume amounts to between AU\$ 12.5 billion and AU\$20 billion.
- Most of the projects for the expansion or new development of mines are in the phase of feasibility studies. There are 33 coal projects in this stage with a total value AU\$ 55 billion: 5 in NSW, 27 in QLD and one in Victoria.
- Five coal projects with a value of AU\$ 8.7 billion are currently under development: 2 in NSW and 3 in QLD.

- Five projects with a value of AU\$ 1.6 billion were concluded in 2017: 3 of them in NSW, 2 in QLD. They include among other BHP's coking coal project Appin in NSW and Anglo American's coal mine Grosvenor.

The Carmichael Mine of the Indian Adani Group became a symbol of a new attitude toward mining in Australia. The project initially cleared important hurdles in 2016. Now, however, there are voices viewing the project as having failed because the rail connection, as discussed below, could not be realised. Moreover, contrary to the announcement by Adani Australia's chief executive, the financing was not secured in March 2018. A spokesman for the company declared that this date had been given on the assumption that the company would receive a low-interest loan from the Northern Australian Infrastructure Facility (Naif). The Labor government of Queensland, however, declared that it would veto any such support. A new point in time for the securing of the financing has not been stated. The commitment to this project remains firm, however.

On 7 May 2018, the Guardian reported that Adani's coal-fired power plants were suffering losses and that "expensive" import coal was to be replaced by Indian coal. According to analysts, the losses of the subsidiary Adani Power in the fourth quarter were so high that the Carmichael project in Queensland was no longer economically feasible. The owner of the Adani Group, Gautam Adani, is also reported to have admitted that the import coal business had contributed to the losses of the power plant company. Quote from the Guardian: "We expect to receive [domestic coal] for the Tiroda and Kawai plants in the near future, which will help reduce fuel costs and improve profitability of these projects"

Infrastructure

The operator Aurizon is no longer planning to build the rail connection from the Galilee Basin, where the planned Carmichael mine of the Indian Adani Group and other large projects (among them, Hancock and Alpha) are located, to the port of Abbot Point. It was announced in February 2018 that it had not been possible to conclude any contracts with customers and that the project would not be pursued any further at this time. This project would have had a financing volume of AU\$ 1 billion. Adani had been planning its own railway project, but it was blocked by the Queensland government.

Export

An 85 % share of Australian hard coal production was exported. Table T2 below shows the loading ports used for export of the coal. We point out here that the transshipment figures from the coal loading ports do not always correspond precisely to the export figures. There may be customs-related reasons for this.

Following a rise in the previous year, Australia's exports fell by 4.6 % to 372 million tonnes in 2017. 201 million tonnes were steam coal (-1 million tonnes) and 171 million tonnes were coking coal (-18 million tonnes). China, India and Japan are currently the largest importers of Australian coking coal. China alone imported 41.3 million tonnes, India 40.1 million tonnes and Japan 35.7 million tonnes. They were followed by South Korea with 17.8 million tonnes and Taiwan with 8.5 million tonnes. Far and away the largest importer of steam coal is Japan with 81.7 million tonnes. It is followed by China with 41.8 million tonnes, South Korea with 31.0 million tonnes and Taiwan with 23.2 million tonnes.

Exports of the Largest Coal Loading Ports

Coal Loading Ports	2016	2017
	Mill. t	Mill. t
Abbot Point	26.7	26.0
Dalrymple Bay	68.4	65.0
Hay Point	49.0	44.1
Gladstone	70.1	68.3
Brisbane	6.6	7.4
Total Queensland	220.8	210.8
PWCS	109.6	104.7
Port Kembla	10.0	5.6
NCIG	53.3	53.4
Total New South Wales	172.9	163.7
Total	393.7	374.5

Source: MCR (Monthly Throughput from Key Export Ports)

LB-T2

Exports to China are subject to influencing factors relating to Chinese industrial and environmental policies. They increased by 11 % to 83.3 million tonnes in 2017. According to information from the China National Coal Association (CNCA), this corresponds to a share of 31 % in the total Chinese hard coal imports (2017: approx. 270 million tonnes).

Hard Coal Exports by Grade

Coal Grade	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Coking Coal (HCC)	122	122	110
Semi-soft Coking Coal	62	67	61
Steam Coal	201	202	201
Total	385	391	372

Source: Australian Department of Industry, Innovation and Science, Office of the Chief Economist/MCR

LB-T3

Development of Australia's Exports to China		
	2016	2017
	Mill. t	Mill. t
Hard Coking Coal	28.1	29.5
Semi-soft Coking Coal/PCI	10.7	11.9
Steam Coal	36.2	41.9
Total	75.0	83.3
Source: McCloskey		

LB-T4

A summary of Australia's key figures is shown here:

Key Figures Australia			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Hard Coal Production	442	433	440
Hard Coal Exports	387	391	372
· Steam Coal	202	202	201
· Coking Coal	185	189	171
Imports Germany	5.7	6.5	5.6
· Steam Coal (incl. Anthracite)	0.1	0.4	0.1
· Coking Coal	5.6	12.1	5.5
Export Ratio	88 %	90 %	85 %
Source: Own calculations/ DESTATIS			

LB-T5

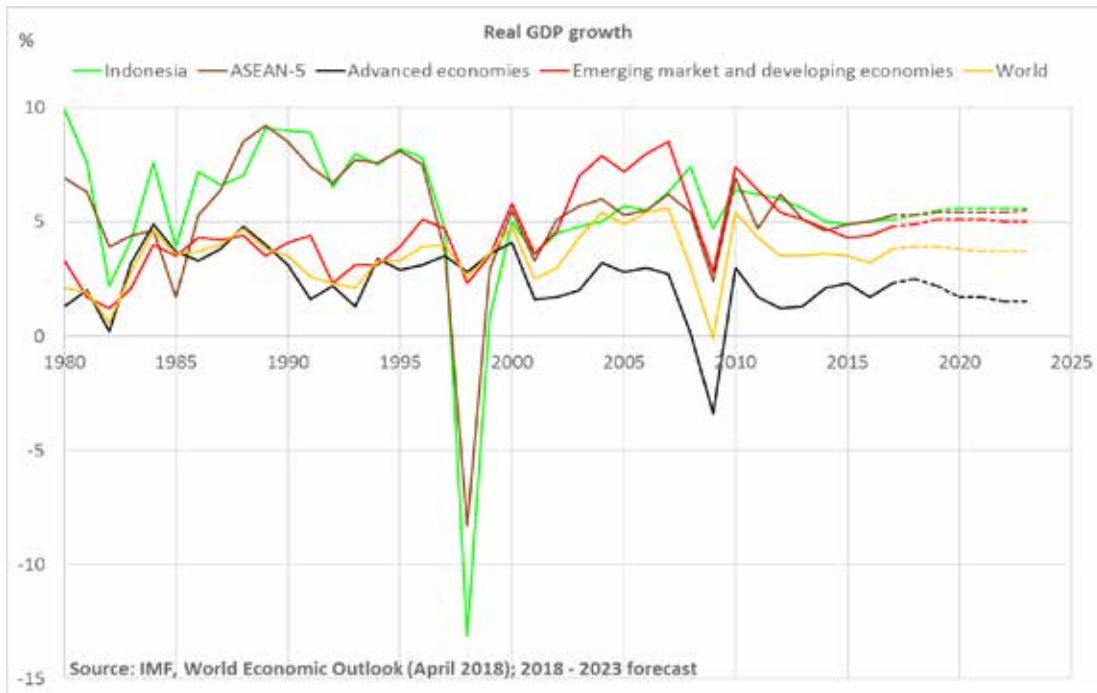
INDONESIA

General

Indonesia is a member of the South-East Asian association, the Association of Southeast Asian Nations (ASE-



AN), and within this group is far and away the largest national economy. Almost 40 % of the GDP of the association is attributable to Indonesia. The World Bank classifies Indonesia as a so-called “Lower Middle-Income Country.” According to the IMF, gross domestic product increased by 5.1 % in 2017 (WEO, April 2018). An increase of 5.3 % is projected for 2018. This puts growth above the level of the developing and emerging countries and almost exactly at the level of the ASEAN 5 countries (Indonesia, Malaysia, Philippines, Thailand, Vietnam). This would mean per capita GDP of US\$ 4,050 in 2018, substantially below the world average of US\$ 11,730. According to Germany Trade and Invest (GTAI), the urban regions have the economic performance of an emerging economy. In some of the rural regions, conditions are still comparable to a developing country.



Real Growth in Gross Domestic Product

According to GTAI, mining and industry contributed 30.6 % to Indonesia's GDP in 2015. In comparison with other countries rich in raw materials such as Brazil or Venezuela, Indonesia, with real economic growth of 5 % (2016), is in an excellent position. As previously mentioned, the IMF expects a plus of 5.1 % for 2017, and growth will probably continue to accelerate in 2018 (+5.3 %). President Joko Widodo nevertheless believes that higher growth is possible. This, however, would require a reduction in protectionism and the renewal of the aged infrastructure. The IMF recommends furthermore that priority should be given to a budget structure reform

that is self-reinforcing and carefully designed to mobilise revenues and structural reforms on the product, labour and financial markets (IMF Country Report No. 18/32, February 2018).

According to the Global Competitiveness Index 2017–2018, the country is in the upper range of the rankings (36th out of 137 countries). On the other hand, Indonesia is in mid-table in the Ease of Doing Business Index 2018 (72nd out of 190 countries) and is 90th in the Corruption Perceptions Index 2016 (out of 176 countries). The country is apparently now taking on the issue of compliance. In January 2018, namely, it became known that the pro-

duction targets of the mining companies for 2018 would be accepted solely if they signed the compliance rules of the Ministry of Energy and Mineral Resources by the third week of January. This requirement applies to the Contracts of Work (CCoW) companies, not the smaller mining companies. About 30 % of the mining companies are not subject to the CCoW and are therefore not under the supervision of the government.

According to GTAI, the decline in world market prices for natural resources is causing major problems for this country so rich in raw materials. Over the past five years, Indonesia's foreign trade has declined by more than one-fourth, and this is prompting the government to pursue an increasingly protectionist course. This approach has frightened off some foreign investors. While foreign direct investments (transfer payments) in 2015 came to US\$ 16.6 billion, they had fallen to US\$ 2.7 billion in 2016. In addition to Japan, the People's Republic of China is becoming more and more significant as an investor.

Indonesia is relatively weakly integrated into international trade flows. The share of foreign trade (imports and exports combined) in the GDP is 30 %; Vietnam, as a contrasting example, posts a value of 170 %. The country's export quota in 2015 came to 17.5 %, but declined in 2016 by 11.4 % to 15.5 %. According to IMF, coal made up 10.1 %, palm oil 9.9 % and oil and gas 9.1 % of total exports in 2016.

Production

Indonesia's coal production has always been driven to a major extent by exports. Domestic consumption has grown steadily, but the government estimate that it will increase substantially in the coming years, and coal is prioritised

as part of the national energy policy. In recent years, the export quota has moved in a magnitude of 80 %.

More than half of the energy use of the government electricity generator PLN comes from coal. The plan is for coal to remain the basis for economic development as well. According to a report from Reuters, dated 13 March 2018, the Indonesian government has set a maximum price for steam coal of US\$ 70 per tonne that will remain effective until 2019 so that favourable energy prices can be offered to consumers. If it is assumed that this price level is 30 % below the world market price, this measure will cost the Indonesian government US\$ 630 million in loss of tax revenue and lower royalties.

Coal production (hard coal and lignite) in 2017 came to 485 million tonnes (VDKi estimates), which would represent an increase by 5.4 % over the previous year's value of 460 million tonnes. Information from the Indonesian Ministry for Energy and Mineral Resources (DSM) indicates that total coal consumption came to 97 million tonnes, 6.6 % higher than in the previous year (Table T8).

PLN expects growth in the use of hard coal in power plants in 2018 of 5 % to 6 % from 83 million tonnes in the previous year to between 87 million tonnes and 88 million tonnes in 2018. Including consumption by industry, especially the paper and cement industry, domestic consumption of 114 million tonnes is expected in 2018. When PLN has completed its power plant investment programme with a scope in output of 35 GW in the next few years, ESDM expects a significant rise in domestic consumption that is today estimated at 240 million tonnes annually for 2019. Since the government, on the other hand, intend to restrict coal production from 2019 to 400 million tonnes annually

(Table T8), there is a threat of use competition between domestic consumption and exports, which would have to be pulled back to 160 million tonnes in 2019. The ministry is very well aware, however, that a restriction on exports would be difficult to enforce. The forecasts of Indonesian government agencies are frequently ambitious as well.

This view was confirmed at the end of April when the plans that had been announced in February had to be changed. It was conceded that the plan figures shown in Table T8 cannot be met because the PLN power plant programme will not be concluded by the end of 2019. The cap of 400 million tonnes annually shown here would then be 450 million tonnes.

Infrastructure

According to information from the news agency Reuters, the Indonesian economics ministry deleted 14 out of a total of 222 infrastructure projects from the list of its wide-ranging national strategic development plan. This action was explained by Darmin Nasution, the coordinating economics minister, as a consequence of the slow progress of the relevant projects, which are supposed to have an investment volume of over US\$ 19 billion. Although they have not been cancelled completely, they have lost incentives in the form of subsidies so that a realisation appears to be rather unrealistic. The affected projects include railway lines in South Sumatra and in the coal mining region Kalimantan as well as airports and seaports on Java. According to information from the transport ministry in East Kalimantan, however, a larger railway infrastructure project for the expansion of the coal delivery chain is in planning in the Kalimantan region. Unlike a passenger train project that was also planned and for which at this time solely the feasibility study has

been prepared, the probability of the realisation of the coal railway project is regarded as very high because the financing is supposed to come exclusively from Russia. The investment volume amounts to about US\$ 2 billion. Construction is scheduled to begin in 2019 and completion is planned for 2022.

Export

In 2014, a law that gradually prohibits the export of some non-processed ores went into effect in Indonesia; its objective is to encourage processing within the country. In the case of coal and palm oil, the Indonesian government are now trying to increase the share in the domestic value creation further by making the use of Indonesian ships and insurance companies obligatory for the export of these goods in 2018. This requirement is completely unrealistic, however, in view of the availability of freight ships. For this reason, the new statute also includes a rule exempting the shipment of coal in so far as Indonesian companies are unable to make a corresponding offer. It can be assumed with a certain amount of confidence, however, that this measure will lead to more bureaucracy and additional costs. After a meeting with the Indonesian associations of the mining industries and shipping companies, reports were heard that the Indonesian trade ministry did not intend to make use of this measure to restrict exports. While this does not appear plausible based on the above remarks on the original planning of production and domestic consumption, it does appear to be so in view of the aforementioned plan revision.

Indonesian coal exports rose significantly in 2017. Hard coal exports rose by 2.3 % from 311 million tonnes in 2016 to 318 million tonnes. Exports of lignite even increased by 20 % from 58 million tonnes to 70 million tonnes. Above

Hard Coal Exports by Market			
	2015	2016	2017 ¹⁾
	Mill. t	Mill. t	Mill. t
Pacific	318.0	303.4	312.7
Europe	8.3	7.2	4.9
USA	0.7	0.6	0.7
Total	327.0	311.2	318.3

¹⁾ Estimated
Source: Prepared McCloskey figures

LB-T6

all, increased demand from India (+4.2 %) and South Korea (+8.9 %) contributed to the rise in exports of hard coal while exports to China declined by 6.9 %, to Japan by 4.8 % and to Taiwan by 13.8 %. (Table T7).

Indonesia has thus been able to defend its position as the dominant steam coal exporter for the Asian-Pacific

The Largest Buyers of Indonesian Hard Coal			
	2015	2016	2017 ¹⁾
	Mill. t	Mill. t	Mill. t
India	123.4	94.6	98.6
China	36.7	50.8	47.3
Japan	32.4	33.0	31.4
South Korea	32.7	35.0	38.1
Taiwan	24.0	20.3	17.5

¹⁾ Provisional, partly based on estimates
Source: McCloskey

LB-T7

region. About 333 million tonnes – 98 % of the exports – were supplied to this economic region (Table T6). India, China, Japan, South Korea and Taiwan took 233 million tonnes. The rest of the demand from the Asian-Pacific region came from ASEAN countries with strong growth.

Key Figures Indonesia					
	2015	2016	2017	2018 ¹⁾	2019 ¹⁾
	Mill. t	Mill. t	Mill. t	Mill. t	Mill. t
Coal Production (Hard Coal and Lignite)	452	460	485	425	400
Hard Coal Production ²⁾	413	402	415		
Lignite Exports	39	58	70		
Hard Coal Exports	327	311	318		
Coal Exports (Hard Coal and Lignite)	366	369	388	311	160
Domestic Consumption (Hard Coal and Lignite)	86	91	97	114	240
Imports Germany	0	0	0	0	0
Export Ratio (Hard Coal and Lignite)	81.0 %	80.2 %	80.0 %	73.2 %	40.0 %

¹⁾ Estimate of Ministry of Energy and Mineral Resources (ESDM)
²⁾ Production, incl. dom. lignite consumption, but excluding lignite exports
Source: Indonesian Coal Mining Association (APBI) & ESDM/MCR/DESTATIS/Own calculations/Estimates

LB-T8

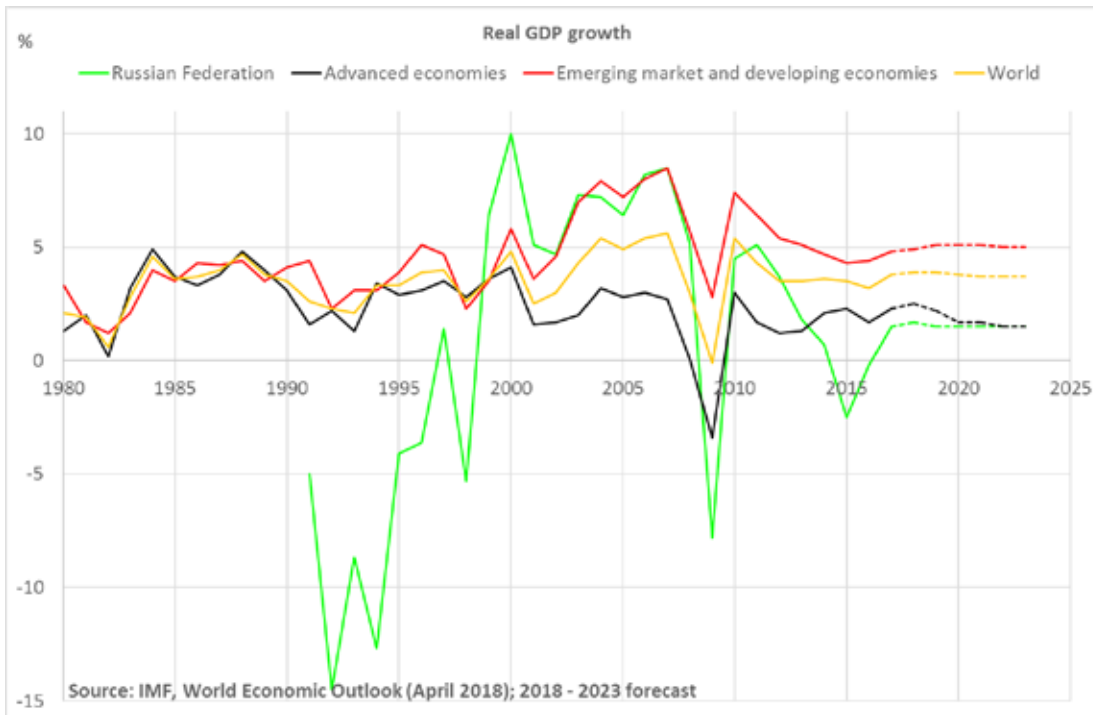
RUSSIA

General



According to the IMF, Russia's gross domestic product increased by 1.5 % in 2017 (WEO, April 2018). An increase of 1.7 % is projected for 2018. This would put per capita GDP at US\$ 11,950, slightly above the world average of US\$ 11,730. Economic growth became detached from the global trend at the beginning of this decade because of political developments and came to -2.5 % in 2015. Since that time, the economy has recovered. The IMF expects growth at the level of the average of the other advanced national economies.

Real Growth in Gross Domestic Product



By lowering the basic interest rate to 7.75 % in 2017, the Russian Central Bank, according to the GTAI economic outlook for Russia, created the basic conditions to ease the granting of loans. Foreign direct investments will also start to rise again. Foreign investments in the Russian non-financial sector exceeded US\$ 30 billion in 2017.

According to the German Society for International Cooperation (GIZ), Russia is one of the world's largest producers of raw materials and has substantial resources, holding as it does one-fourth of the world's natural gas reserves and the second-largest coal reserves (19 %). Raw materials comprise about 80 % of exports and finance about 50 % of government expenditures. The export structure is very strongly oriented to raw materials. The entire economy, and not just Russian foreign trade, is highly dependent on the price of crude oil. Russia consequently extended the production limit for crude oil to 1.8 million barrels a day agreed with the Organisation of Petroleum Exporting Countries (OPEC) until the end of 2018.

In 2016, Russia's foreign trade quota came to 36.5 %, while the export quota was 22.2 %. The most important export goods include oil (25.8 %) and petrochemicals (16.1 %). Among the German import goods, oil had a share of 33.2 %, natural gas was at 29.0 % and coal at 4.2 %. According to the IMF, exports increased by 25 % to US\$ 353 billion in 2017.

In the Ease of Doing Business Index, Russia placed 35th out of 190 countries in 2018, moving up from 112th place in 2012. This is an enormous progress. In 2017–2018, Russia's ranking in the Global Competitiveness Index was at a similarly high level, placing 38th out of 137 countries. National indebtedness in Russia at about 10 % of

the GDP remains comparatively low. In the Corruption Perceptions Index of 2016, however, the country did no better than 131st out of 176 countries.

The European Union extended economic sanctions against Russia until 31 July 2018 as a reaction to the Ukraine crisis. The Russian counter-sanctions remain effective until the end of 2018. The new sanctions imposed by the USA on Russia could have an extremely negative impact on the investment climate and endanger the stability of the Russian ruble.

Production

Russia is one of the world's largest hard coal producers. Only China, the USA, India, Australia and Indonesia have higher production. Hard coal mining is the only sector in the Russian energy industry that is completely in private hands. In the past year, hard coal production amounted to 408 million tonnes, about 6.3 % above the value of 2016. Production of the largest Russian producer of steam coal, the Siberian Energy Coal Company (SUEK), alone came to 108 million tonnes in 2017.

According to the Russian Coal Group, hard coal is currently mined in the Russian Federation by 150,000 miners in 22 coal basins with a total of 129 deposits. The Russian energy ministry expects hard coal production of 480 million tonnes in 2030. This presumes high investments along the full length of the added-value chain. At this time, the Russian hard coal mining companies are highly dependent on the import of mining equipment and spare parts. There is also a need to ensure adequate availability of highly qualified personnel.

Infrastructure

While hard coal exports continue to rise steadily, Russian hard coal mining could export substantially more. The

Hard Coal Production Russia			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Coking Coal	95	98	104
Steam Coal ¹⁾	278	286	304
Total ²⁾	372	384	408

1) Incl. anthracite and lignite, 2) 2015 rounding-off difference
Source: Rosinformugol

LB-T9

Russian infrastructure, especially the inadequate development of the railway network and seaports, limits the development of exports. Despite its inadequacies, the Russian railway network posted a record high of the past five years in 2017, carrying 1.26 billion tonnes of total freight. The total rise in comparison with the previous year was about 3.2 %. Coal transports benefited especially strongly, increasing by 9.1 % to about 359 million tonnes in comparison with 2016 and posting an all-time high. The coal freight volume could be much higher, however. Major problems in domestic transport in Russia frequently arise because coal cars are not returned by the export ports to the coal mining areas, leading repeatedly to a shortage of railway cars. As a counter-measure, SUEK increased the number of its own railway cars by more than one-third last year with the aim of decreasing its dependency on the Russian national railway company. In 2016, Russian providers were unable to profit adequately from rising prices in China because of problems in domestic transport.

In February 2018, a deep-sea port with a capacity of 20 million tonnes a year was opened near the city Taman on the Black Sea coast of Crimea. Coal that was previously shipped via Black Sea ports in Ukraine as well as via Murmansk and Baltic ports is now transshipped through the new terminal. In the estimation of Denis Ilatovsky, Director Logistics at SUEK, these additional capacities were required so that customers in the countries bordering the Mediterranean such as Italy, Israel, Turkey and Morocco could be reached more easily.

Construction of a coal terminal in the port of Murmansk with a capacity of 18 million tonnes a year began on 30 March 2018. The Lavna Project at a cost of US\$ 432 million is scheduled to begin operation in 2020 and to reduce the exports through Ukraine and the Baltic countries. In the past year, 25 million tonnes of Russian coal were still transshipped in those ports, according to the Russian transport ministry.

With the development of new mining areas in the eastern part of the country, it could become possible to supply to customers in the Asian-Pacific region at lower cost. According to the Russian energy ministry, production in the east of Russia could rise significantly in 2030.

Export

Russia is the world's third-largest exporter of hard coal, surpassed solely by Australia and Indonesia. Of the Russian seaborne exports, 86 % is steam coal, 14 % coking coal. Russian coal is exported to almost 80 countries, including China, Japan, the Netherlands, Poland, South

Korea, Turkey and, in particular, Germany. According to estimates of the Russian energy ministry, exports to the Asian-Pacific region could increase by 50 million tonnes by 2035. The upward trend in exports through the eastern seaports of the country are even now of special importance for the development of sales.

Driven by the markets in Asia, North Africa and Turkey, exports of Russian steam coal rose by 7 % from 131 million tonnes in 2016 to 140 million tonnes in 2017. Despite the reduction in the exports of steam coal by 9.4 %, South Korea remained the most important customer in Asia for Russia in 2017. Of the total seaborne Russian exports, 25.8 million tonnes went to this country. China was almost equal at 25.6 million tonnes. Exports to Japan came to 17.2 million tonnes. Exports to North Africa and the Mediterranean region also posted significant increases. Exports to Turkey increased by 19.2 % to 3.2 million tonnes in 2017. In 2017, 7.7 million tonnes were sold to Poland. In comparison with the previous year, sales to Poland rose by 45.4 %. Because its own deposits are exhausted, Poland is relying increasingly on import coal.

German imports from Russia increased by 10.2 % to 19.4 million tonnes. Most of these imports are steam coal. Russia is now far and away Germany's most important coal supplier.

Key Figures Russia			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Coal Production	372	384	408
Hard Coal Exports Seaborne	142	153	163
· Steam Coal	118	131	140
· Coking Coal	17	22	23
Imports Germany	16,7	17,6	19,4
· Steam Coal	14,9	16,2	17,6
· Coking Coal	1,6	1,3	1,8
· Coke	0,2	0,1	0,0
Export rate in %)	38 %	40 %	40 %
Source: MCR/DESTATIS/Own calculations			

LB-T10

COLOMBIA

General

The peace agreement concluded with the FARC guerrillas on 26 September 2016 gave rise to new hope in Colombia. The peace process suffered a damper on 2 October 2016 when the proposals were rejected by a thin margin in a referendum, and a second initiative for the peace process became necessary. It proved to be extremely difficult to resolve the conflict with the ELN guerrillas as well after the peace agreement with the FARC guerrillas.



Since the congressional elections in Colombia on 11 March 2018, the continuation of the peace process has become completely uncertain. The right-wing conservative party "Democratic Centre" of the former president, Álvaro Uribe, a vehement opponent of the peace process, became the largest party in the Chamber of Representatives, although it did not gain a majority in either house of Congress.

The party of the architect of the peace process, Juan Manuel Santos, suffered significant losses in comparison to the last election. The new party of the FARC received only 0.5 % of the vote and the five seats guaranteed to

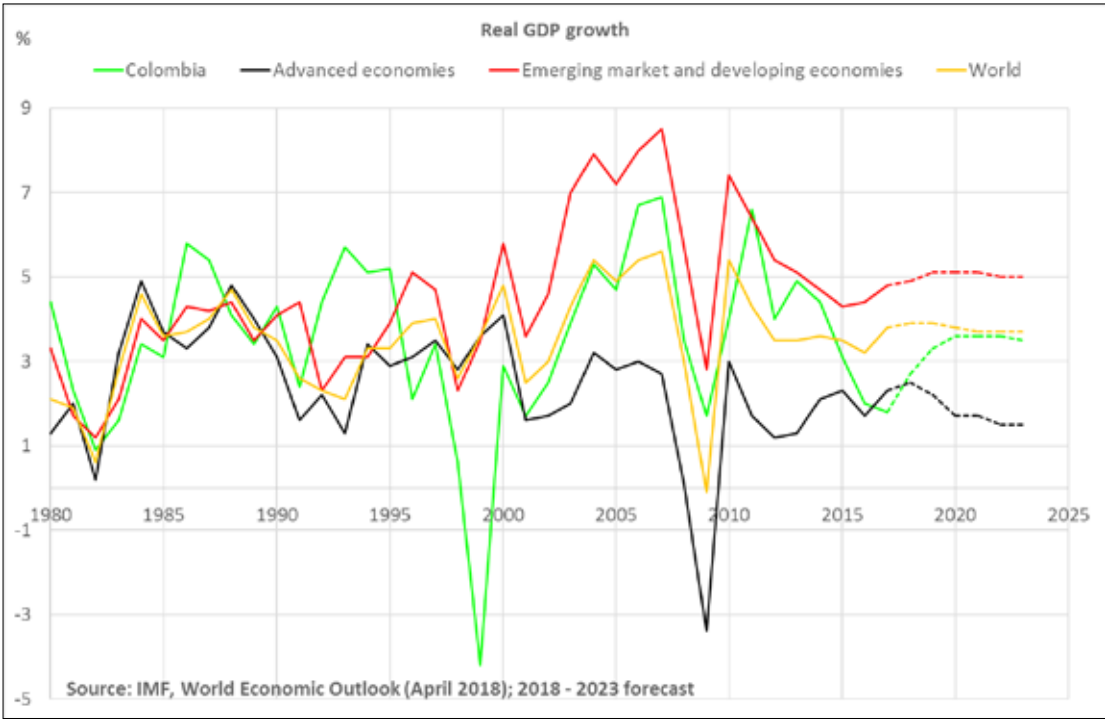
it by the peace agreement. The supporters of the peace process together have a little less than half of the seats in both chambers. There is consequently no majority for continuation of the peace process in either chamber, and important reforms cannot be initiated.

The presidential election in Colombia was held on 27 May 2018. Since none of the candidates received the required absolute majority, a run-off election was held on 17 June 2018. This was won by the right-wing conservative Iván Duque.

Many former FARC rebels have joined either criminal gangs or the ELN because they do not see any prospects for positive development. The humanitarian disaster in the region bordering Venezuela is tying up additional forces that would be needed for the peace process. Colombia urgently needs political support from Germany if it is to be able to continue the peace process. Economic cooperation in particular is of decisive importance.

Real Growth in Gross Domestic Product

In 2011, Colombia's gross domestic product (GDP) was still at the level of other developing and emerging countries, but has since taken a nose dive. In the estimation of the IMF, a turning point was reached in 2017. According to the IMF, GDP increased by 1.8 % in 2017 (WEO, April 2018). An increase of 2.7 % is expected for 2018, and growth could return to the level of the global average by 2023. Per capita GDP in 2018 will presumably amount to US\$ 6,580, well under the world average of US\$ 11,730, but above the average for developing and emerging countries of US\$ 5,490.



Important economic sectors are industry, which contributes a share of 11.2 % to GDP, and mining, which has a share of 6.4 % (in each case per 2016). According to GIZ, Colombia has concluded a series of free trade agreements in recent years. The agreement with the USA has been in force since May 2012, and the agreement with the EU was signed in August 2013. Colombia's foreign trade has recovered from the crashes in 2015 and 2016. Exports are benefiting especially from the rise in oil prices and the peso devaluation. Important export goods in 2016 were oil (with a share of 26.0 %), food (16.2 %)

and coal (14.9 %). For 2016, the IMF expects growth in exports of 8.7 % to US\$31 billion.

In the Ease of Doing Business Index 2018, Colombia ranked 59th out of 190 countries, which put it at the end of the top third. In the Global Competitiveness Index 2017–2018 (66th out of 137 countries) and the Corruption Perceptions Index (90th out of 176 countries), the country was in the middle of the rankings.

Production

Colombia's hard coal production (steam and coking coal) decreased by 1 % from 90.5 million tonnes to 89.4 million tonnes in 2017 (source: National Ministry of Mines and Energy). The Cesar Department, where the companies Drummond, Prodeco (Glencore's operations) and Colombia Natural Resources (Murray Energy) operate, produced 50.7 million tonnes in 2017, 5.0 % more than in the previous year. Drummond's production rose by 14.4 % to 32.5 million tonnes, but Prodeco's production fell to 14.6 million tonnes (-15.8 %). Colombia Natural Resources produced 3.6 million tonnes, 20 % more than in the previous year (3.0 million tonnes). Production of 32.2 million tonnes came from La Guajira (Cerrejón and Caypa), a decline of 1.6 %, whereby production from Cerrejón, the largest producer, increased slightly. In the country's interior, primarily coking coal is produced in the departments Boyacá, Cundinamarca, Santander and Norte de Santander. Production fell from 9.5 million tonnes in 2016 to 6.6 million tonnes in 2017(-43.9 %).

A collective bargaining agreement between the trade union Sintracarbon and Cerrejón was concluded on 9 February 2018, two days before the possible start of a strike. The concluded agreement has a term of two years and provides for income increases of 6.1 % for the first year. A minimum of 5 % depending on the consumer price development was agreed for the second year. In addition, limited-term employment contracts were converted into unlimited contracts for 230 workers, and additional social benefits were agreed.

Infrastructure

Since the opening of the enlarged Panama Canal in 2016, the flow of goods on this important waterway between Atlantic and Pacific has increased significantly. According to the administration of the Panama Canal, the tonnage passing through the canal in 2017 increased by 22.2 % in comparison with the previous year. The modernisation of the Panama Canal offers improved infrastructure to Colombia as well. Exports via this transport route increased by 113 % to 17 million tonnes in the past year. They comprised above all steam coal shipments to Chile and Mexico.

The new coal terminal Aguadulce on the Pacific Ocean was opened at the beginning of the year. It is now possible to load ships of the Panamax class of up to 80,000 tonnes in the region.

The railway line via the Central Railway System (CRS) to Chiriguana and the connection to the Fenoco railway line were overhauled in 2017. Parallel to this, a second railway line with a length of 191 km is under construction. At the beginning of the year, it was 86 % complete.

Steam Coal Exports by Company			
Exporter	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Cerrejón	33.4	32.4	31.8
Drummond	27.9	32.6	32.8
Prodeco	16.9	19.2	13.9
Colombia Natural Resources (CNR)	2.6	2.9	2.9
Other (incl. Central Colombia)	0.8	1.5	1.7
Total	81.6	88.6	83.2
Source: Own assessment; rounding-difference in the total for 2017			

LB-T11

Export

Steam coal exports in 2017 fell by 6.1 % to 83.2 million tonnes. Cerrejón exported 31.8 million tonnes, a little less than in the previous year. Drummond slightly increased its exports by 0.6 % to 32.8 million tonnes and remains the Number One steam coal exporter in Colombia. Exports from Prodeco, on the other hand, declined massively by 27.6 %.

Die Colombia's outlook for exports to the Asian-Pacific region are no longer as good as they largely appeared in 2016. In April 2018, the arbitrage window for shipments to China and India was as good as closed, but South Korea is still within the range of Colombian exporters. The largest import country for Colombian coal is in the Mediterranean region, however. Turkey bought 17 million tonnes in 2017. Mexico and Chile followed at 7 million tonnes each.

The general overview below shows that Colombian steam coal exports declined significantly and could not be compensated by an increase for coking coal. The export quota fell slightly to 96 %.

Key Figures Colombia			
	2015	2016	2017
	in Mill. t	in Mill. t	in Mill. t
Hard Coal Production	85.5	90.5	89.4
Hard Coal Exports	83.2	89.7	85.7
· Steam Coal	80.5	88.6	83.2
· Coking Coal	2.7	1.1	2.5
Imports Germany	9.9	10.8	6.4
Export ratio	97 %	99 %	96 %
Source: Various analyses			

LB-T13

Structure of the Colombian Steam Coal Exports ¹⁾			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
America	22.8	24.9	28.1
North America (USA + Canada)	8.0	7.1	5.7
South and Central America	14.8	17.8	22.4
Asia	19.6	7.6	6.2
Europe	57.6	56.1	48.9
Mediterranean Region ²⁾	20.7	25.4	27.2
North-West Europe	36.9	30.7	21.7
Total	100.0	88.6	83.2
¹⁾ Export figures do not include coking coal and coke.			
²⁾ Delimitation: France, Greece, Italy, Spain, Turkey			
Source: MCR, own calculations			

LB-T12

REPUBLIC OF SOUTH AFRICA

General

Economic growth in the major mining country South Africa has been subject to immense fluctuations since 1980. It is well below the real growth in gross domestic product (GDP) of developing and emerging countries, but



also below the global average, and tends to hover more around the level of the advanced national economies. According to the IMF, GDP increased by 1.3 % in 2017 (WEO, April 2018). An increase of 1.5 % is projected for 2018. Per capita GDP in 2018 will presumably amount to US\$ 6,460, well under the world average of US\$ 11,730, but above the average for developing and emerging countries of US\$ 5,490. The IMF expects an increase in GDP growth to 1.8 % by 2023. The hopes for growth are in no small part based on the resignation of Jacob Zuma, the previous president, who was involved in corruption scandals. Cyril Ramaphosa, co-founder of the South African mining trade union NUM and its first secretary-general and later influential entrepreneur, took over the chairmanship of the African National Congress (ANC) in December 2017 before becoming president as well on 15 February 2018. His greatest interest is in the fight against corruption and the strengthening of the judiciary.

The greatest challenge relating to the parliamentary elec-

tions coming up in 2019 will presumably be dealing with the demand of the left-wing radical "Economic Freedom Fighters" to expropriate white farmers without any compensation. Owing to the size of the agricultural sector, this would have substantial impact on the financial sector.

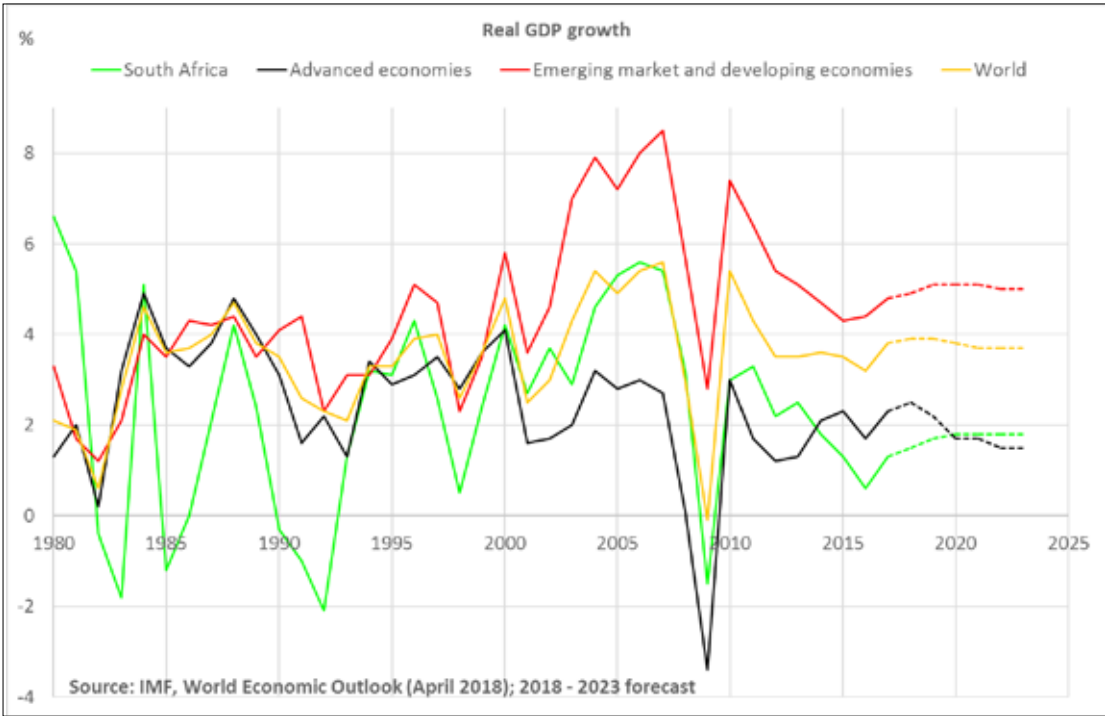
Real Growth in Gross Domestic Product

The financial means for a planned growth programme are severely limited. Large state-owned companies have been noted in the past for their mismanagement. This is especially true of the electricity utility Eskom. Disruptions in power supply occur repeatedly and are a major issue for the South African economy. On 10 May 2018, the South African media platform Eyewitness News (EWN) reported that Eskom had suspended three power plant managers from their duties because of the poor supply situation. Moreover, the company announced it wanted to conclude new coal supply contracts to ensure adequate supplies to its power plants until winter.

The South African energy policy relies in part on the expansion of coal and nuclear energy, but is increasingly engaged in the use of renewable energy sources as well.

The African Continental Free Trade Agreement was signed on 21 March 2018. It is regarded to be a major step toward the establishment of an intra-African trade zone. The two largest African economies, South Africa and Nigeria, have not yet signed the agreement, however, owing to concerns about negative impact on domestic companies.

In the Ease of Doing Business Index 2018, South Africa is 82nd out of 190 countries and is no more than mediocre. The ranking in the Global Competitiveness Index 2017–2018 is 61st place (out of 137 countries) and in



the Corruption Perceptions Index 2016 64th place (out of 176 countries).

Production

The mining industry in South Africa is also confronted with difficult general conditions. Discussions about the reform of the Mining Charter have been going on for a long time, and the reform is also the subject of litigation. Companies are concerned above all about the regulations under Black Economic Empowerment (BEE). The minimum share of BEE beneficiaries is supposed to be increased from 26 % to 30 %, and black share-

holders are also supposed to be given preference in the disbursement of dividends. The government pushed for compliance with the minimum values for shareholder participation of BEE beneficiaries and attempted to secure this compliance in court proceedings although failure to reach this threshold is regularly caused by the sale of participations by BEE beneficiaries. In April 2018, the highest court decided that the mining companies did not have to adapt their shareholder participations to the BEE threshold values. The new mining minister, Gwede Mantashe, a former secretary-general of NUM, is confident that the Mining Charter will be reformed by June

2018 and will also give due consideration to business interests.

South African hard coal production in 2017 increased only very slightly by 0.7 % in comparison with 2016. Virtually all of the production (99 %) is steam coal. The remainder is anthracite.

Infrastructure

There are plans to make the South African transport infrastructure ready for the future. The aim in freight railway traffic is to expand capacities for the export of coal and manganese. About US\$ 64 billion is earmarked for the expansion of the transport infrastructure by 2050. The railway sector is supposed to receive just under half of this sum. During the planning and realisation of individual projects, the large state-owned companies such as Transnet, the operator of the country's freight railway traffic and ports, are to be involved most of all. The company's focus is on the export corridor for coal, which has a length of 978 kilometres. It runs from Waterbergen in the north of the country to the Richards Bay Coal Terminal. The target is the increase in freight capacity from the current 81 million tonnes to 132 million tonnes. This is to be achieved by transferring general freight traffic to an alternate line. The Swazi Rail Link has been marked for this purpose. The project with a budget of about US\$1.4 billion encompasses construction of a new line through Swaziland of about 150 kilometres.

The Richards Bay Coal Terminal posted record transshipment of 76.5 million tonnes in 2017 and did so despite poor weather conditions. 82 % of the transshipped coal was shipped to Asia.

Export

South Africa will profit during the coming years especially from a boom in the demand for steam coal in India and Pakistan. The expectation is that India, the Number One buyer for South African coal, will purchase 200 million tonnes of steam coal annually until 2022, about 30 % more than the current volume. About half of South Africa's steam coal production is going to India even today. Almost a quadrupling from the current 11 million tonnes to 40 million tonnes is expected for Pakistan by 2022. Ten additional power plants with an output totalling 6.7 GW are scheduled to go online in Pakistan by 2022. In the past year, 60 % of Pakistan's steam coal imports came from South Africa.

South Africa could also profit from an increase in freight rates. Times characterised by massive overcapacities are now being followed by construction of freight hold capacities for bulk goods that is not keeping pace with demand. An increase in freight rates would favour South Africa while it would be more of a disadvantage for Colombia and the USA.

Structure of the Exports in 2017

	Total	Europe ¹⁾	Asia	Miscellaneous
	Mill. t	Mill. t	Mill. t	Mill. t
Steam Coal	81.5	6.1	61	14.4
Anthracite	1.6	0.2	0.8	0.6
Total	83.1	6.3	61.8	15

1) Incl. bordering Mediterranean countries
Source: IHS Exports: Coal and coke by country and type

LB-T14

Far and away the most important export country for South Africa is India (as described above), even though

exports (excluding anthracite) declined by 2.7 % to 36.4 million tonnes in 2017. Shipments to Pakistan of 8.6 million tonnes are in second place; shipments increased by 75 % over 2016. It is followed by exports to South Korea in the amount of 8.6 million tonnes after 2.6 million tonnes in the previous year. The record growth of 216 % led at the same time to record sales. South Korea's demand for steam coal will continue at this level as well after the completion of new power plants. Relatively speaking, growth in shipments to Taiwan were even higher: by 319 % to 3.2 million tonnes. The increase in shipments to Spain by 164 % to 2.7 million tonnes was also substantial. Sri Lanka purchased 2.3 million tonnes in 2017 and Mozambique 2.0 million tonnes, representing a record increase of no less than 447 %.

Exports to Germany declined by 20 % to 1.6 million tonnes. 3.1 % of the steam coal imports to Germany still comes from South Africa.

Key Figures Republic of South Africa			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Hard Coal Production	252.1	251.0	252.3
· Steam Coal	248.7	248.0	249.5
· Anthracite	3.4	2.6	2.9
Hard Coal Exports ¹⁾	76.5	75.5	83.1
· Steam Coal	74.8	74.2	81.5
· Anthracite	1.7	1.3	1.6
Imports Germany	3.4	2.0	1.6
· Steam Coal	3.4	1.8	1.4
· Anthracite	0	0.2	0.2
Export Ratio	30.3 %	30.1 %	32.9 %
¹⁾ Seaborne only Source: MCR/DESTATIS			

LB-T15

USA

General

Gross domestic product (GDP) of the USA developed in recent decades in step with the average of advanced national economies. According to the IMF, GDP increased by 2.3 % in 2017

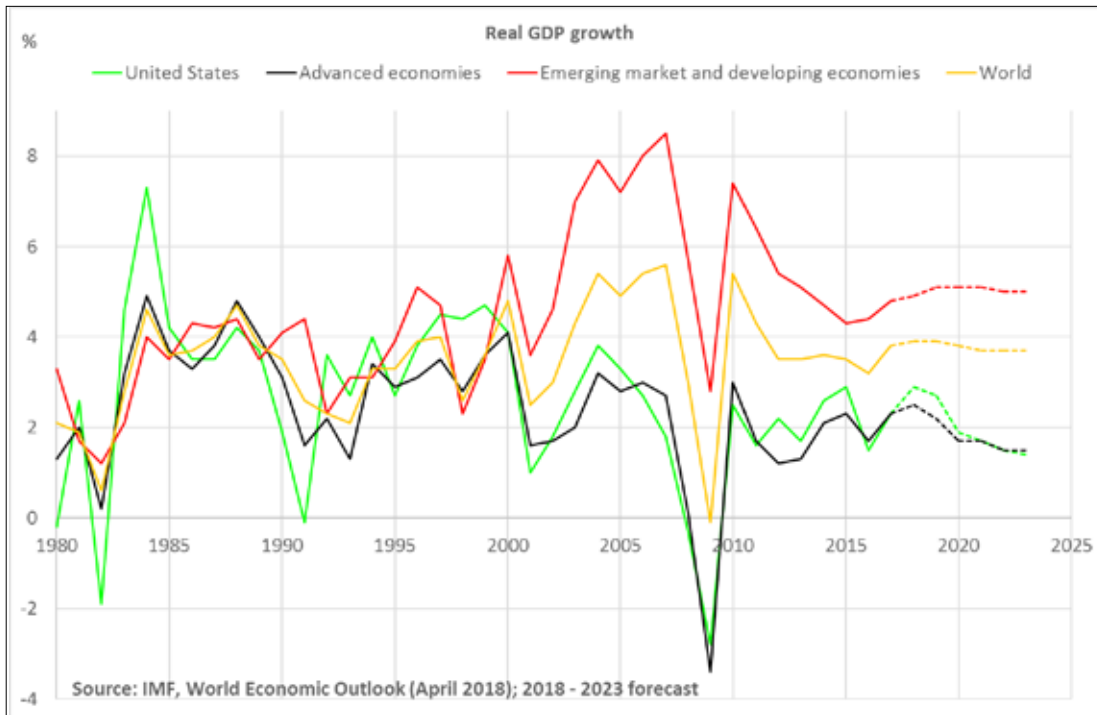


(WEO, April 2018). An increase of 2.9 % is projected for 2018. This would put per capita GDP at US\$6 2,150, significantly above the world average of US\$ 11,730.

Real Growth in Gross Domestic Product

The year 2017 was a year of both consolidation and ascent after a number of renowned American companies had to file for creditor protection under Chapter 11 in 2016. After the sharp decline of hard coal production from 813 million tonnes in 2015 to 666 million tonnes in 2016, it rose again by 5.4 % to 702 million tonnes in 2017. Great improvements in export opportunities led to a recovery; hard coal exports in 2017 increased by 61 % over the previous year.

The table below shows a breakdown of coal production per region. The rise in the West of 6.6 % was precisely within the parameters of the trend in the American coal industry; the increase of 10.4 % in the Appalachians was above average; and the increase in the Midwest of 0.8 % was clearly below average.



Production in the USA by Region

	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Appalachians	201	163	180
Middle West	152	131	132
West	460	366	390
Total	813	660	702

Source: DOE-EIA

LB-T16

Coal no longer plays the dominant role of the past decades in the USA, but at least it was able to stabilise in 2017. In 2017, the share of natural gas came to 32 % in comparison with 34 % in the previous year while the share of coal in 2017 was able to maintain the same level as in the previous year, a share of 30 %, according to the Energy Information Administration (EIA, an agency of the US Department of Energy DOE). Price development and the development of power plant capacity will decide on the future use of hard coal in electric power generation. Since 2010, about 600 coal-fired power plants have been shut down, although they were generally small and on average

59 years old. The remaining power plants are on average 41 years old and have an average capacity of 340 MW.

The downward trend of coal might be moderated by current political developments. The Department of Energy and the Federal Energy Regulatory Commission (FERC) are currently discussing measures for strengthening grid stability, and this could in part also benefit coal. Some market players even speak of a “game changer” in this context. The general conditions of environmental policies, on the other hand, have not changed dramatically. Even though the Trump administration has declared its intention to roll back the Clean Power Plan, no decisive changes favouring coal have occurred at this time. This has been of little surprise to many market players – many of them assumed in any case that Donald J Trump would be unable to keep his promise to bring back the jobs of mine workers.

According to a report from Reuters of 13 February 2018, government figures for 2017 show an increase in the number of mine workers of only a few hundred. The NPR News (Washington, D.C.) of 23 February puts the increase in employment at 1,001 on the basis of data from the Occupational Safety and Health Administration. The largest increase of 1,429 workers was found in West Virginia. Alabama posted growth of 494, Virginia of 243 and Pennsylvania of 124. This did not come even close to balancing the decline since the 1980s, however. And there is no doubt that this is more of a temporary effect driven by the market and not a “political success” of the White House. In particular, the growing exports and in no small part Typhoon Debbie in Australia have made themselves noticeable in a positive sense for hard coal mining in the USA.

Infrastructure

On 12 February 2018, the American president Donald J Trump announced an infrastructure programme. It will, however, most likely be of very little benefit to coal. This programme will positively impact steel consumption only indirectly, but it is to be assumed that the additional demand will be covered primarily by electric steel. In the estimation of IHS Markit, this will result at most in additional demand of 1 million tonnes of coking coal. Additional use of coal in the amount of 1 to 2 million tonnes could be expected in the cement industry.

Exports from the USA were still handled primarily via the East Coast and Gulf Coast in 2017 (71 million tonnes). Of this figure, 30 million tonnes were steam coal and 41 million tonnes were coking coal. The attractive price level for both steam and coking coal was opposed by restrictions in logistics that held back a stronger rise in production and certainly any overheating.

The American company Lighthouse Resources from Utah, which operates mines in Montana and Wyoming, is pursuing the Millennium Bulk Terminals Project with a value of US\$ 680 million, which is supposed to be built on the Columbia River in Longview, Washington. This project would provide capacity for the shipment of 44 million annual tonnes of coal from the Powder River Basin. This would create an important distribution channel for additional shipments to South Korea, Japan and other Asian customers. In autumn 2017, however, the environmental protection authorities of Washington State refused to agree to a permit under water protection laws. Lighthouse Resources responded by suing the State of Washington in January 2018. Moreover, the company accused the governor and government of discriminating against coal

and blocking mining operations in neighbouring states. The six states Wyoming, Montana, Kansas, Utah, South Dakota and Nebraska supported these protests as did the associations of agriculture, industry, mining, the oil business and petrochemicals.

As early as 2014, the city of Oakland, California, prohibited the shipment of coal through the Oakland Bulk & Oversized Terminal. The operators viewed this as a breach of the agreement with the city relating to the construction of the terminal in the proximity of the port of the city of Oakland and filed suit. In May 2018, Bloomberg News reported that an American district court ruled the prohibition to be illegal. The court followed the argumentation of Oakland Bulk & Oversized Terminal LLC that the terminal did not present any threat to the health of employees or the surrounding communities.

Without access to seaports on the West Coast, Wyoming and the Powder River Basin in Montana would be cut off from the world market. Environmental activists are therefore attempting to keep these coalfields away from international markets in other terminals on the Pacific coast and not only in Oakland in California. If the ruling of the district court stands, this could lead to an increase in American imports by 19 % according to an estimate of the Sierra Club.

Export/Import

It was not the ending of the “War on Coal,” but rather the development on the export markets that became a “game changer” in the USA in 2017. Coal exports from the United States increased by 61 % in comparison with 2016 to 88 million tonnes in 2017. Just under two-thirds of this volume are coking coal, a good one-third is steam coal.

The changes varied rather significantly. Steam coal exports rose by 116 %, coking coal exports by 35 % in 2017.

The export quota in 2017 came to 12.5 % following 8.5 % in the previous year (Table T19).

American coal was exported primarily by sea (83 million tonnes); a small part went overland to Canada (5 million tonnes) (Table T17).

Exports USA 2017			
	Coking Coal	Steam Coal ¹⁾	Total
	Mill. t	Mill. t	Mill. t
Seaborne	46,4	36,8	83,1
Overland (Canada)	3,8	1,0	4,8
Total	50,1	37,8	87,9
<small>¹⁾ Including anthracite Source: McCloskey</small>			

LB-T17

Seaborne imports in recent years have remained largely constant. That is why the export balance illustrated below largely tracks the tendency in exports. After several years of decline, the export balance in 2017 rose again to 77 % (Table T18).

Of seaborne steam coal exports from the United States in 2017, 36 % went to the European Union and 7 % of that to Germany. The remaining almost two-thirds went to South and North America as well as to Asia, whereby 18.6 % of the steam coal exports from the USA went to India (6.8 million tonnes) and 14.5 % went to South Korea (5.3 million tonnes). About 7 % each went to Mexico and Japan. Many extreme relative changes among the purchasing countries were especially striking. India’s steam coal imports from the USA rose by 181 %, imports to South

Import-Export Balance USA (Seaborne)						
	2012	2013	2014	2015	2016	2017
	Mill. t	Mill. t	Mill. t	Mill. t	Mill. t	Mill. t
Export (seaborne)	107	100	82	62	50	83
Import (seaborne)	7	7	9	9	8	6
Export Balance	100	93	73	53	42	77
Source: McCloskey						

LB-T18

Korea by an astonishing 417 % and imports to Japan by 332 %. To this extent, the question arises as to whether the USA must still be regarded as a swing supplier for the Asian and especially for the Indian market or whether the American providers will become permanently established on this market. In any case, Indian demand for steam coal will rise tremendously and open up room for imports. According to India's Central Electricity Authority, 65 power plants are currently under construction, 146 are in the planning stage and 91 projects have been announced.

The European Union was also an important supplied region for coking coal (30 %). The other volumes went to South and North America, including Brazil at 14 % (6.6 million tonnes), and to Asian countries, including Japan at 10 %, India at 8 % and South Korea at 7 %. Ukraine received 8.5 % (3.9 million tonnes). Imports to Ukraine in-

creased by 114 %, a consequence, among other reasons, because of political support.

It can be noted, not only with respect to Ukraine, that the USA under President Trump has developed a new form of "export subsidisation." The USA brokered coal deliveries in 2017 to countries that were in political conflict with Russia or wanted to limit excessive dependency on imports; such supplies were intended as substitutes for Russian shipments.

The exports of American steam coal to Turkey were also able to increase substantially because of political influences. The Turkish government does not want to lower the upper limit for sulphur content of import coal, but instead raise it from 1.2 % to 3 % to 4 % sulphur content. This would make it possible to use the American coal with high sulphur content that is traded in the EU at discounts – a development that will undoubtedly meet with a tremendous lack of understanding from an environmental policy standpoint in the European Union. This additional market share of high-sulphur coal would be to the detriment of Colombian and Russian suppliers and most likely lead to downward pressure on prices.

The coking coal exports of the USA profited especially from production disruptions in Queensland caused by Typhoon Debbie in 2019. Since the Australian producers have in the meantime been able to restore their production, the question remains whether the American suppliers will still be

able to place their production in 2018 on the Asian markets. Another decisive issue here will be whether and to what extent the freight rates continue to rise this year.

Key Figures USA			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Hard Coal Production	813	660	702
Hard Coal Exports	67	55	88
· Steam Coal	25	18	38
· Coking Coal	42	37	50
Hard Coal Imports	10	8	7
Imports Germany	11	9	9
· Steam Coal	8	6	6
· Coking Coal	3	3	3
Export Ratio	8,2 %	8,3 %	12,5 %

Source: Various and own calculations

LB-T19

CANADA

General

Canada is a medium-size mining country and an important coking coal exporter by sea. The major share of production and export



mines is located in British Columbia and Alberta.

According to the IMF, Canada's gross domestic product increased by 3.0 % in 2017 (WEO, April 2018). An increase of 2.1 % is projected for 2018. This would put per capita GDP at US\$ 48,470, significantly above the world average of US\$ 11,730.

Real Growth in Gross Domestic Product

According to the most recent Report on Energy Supply and Demand in Canada of 2016, primary energy in production in Canada rose by 2.9 % in 2016. In 2016, crude oil had the greatest share in primary energy production in Canada (45.1 %), followed by natural gas (35.0 %), "primary electric power generation" (i.e. hydroelectric power and nuclear energy; 9.3 %) and coal (6.8 %). Energy consumption in Canada in 2016 declined by 0.8 %.

Hydroelectric power had a share of 60.4 % of the electric power generation (partially estimated) in 2016. Canada places a high value on the determination that about 80 % of the electric power generation comes from non-fossil sources. Besides hydroelectric power, nuclear power (13.8 %) and other renewable energy sources



es (5.9 % in 2015) are such sources. Natural gas has a share of 9.2 %, coal a share of 8.9 %. Unlike other hard coal producers, Canada does not rely primarily on coal for electric power generation, but on the abundantly available hydroelectric power. To this extent, it is easier for the Canadian government to forge plans for an exit from coal.

In February 2018, the Canadian government announced a proposed tightening of the Canadian regulations for coal-fired power plants. This would ensure that all coal-

fired power plants would have to meet a strict emission standard by 31 December 2029. This approach would accelerate the exit from coal-fired power generation by 2030 as provided in Canada's "Clean Growth and Climate Action Plan."

According to the current regulation, which entered into force on 1 July 2015, new coal-fired power plants must already meet a strict emission standard (420 g CO₂/kWh) while existing coal-fired power plants do not have to meet this standard until the end of their economic

useful life. In the Canadian regulations, the end of the useful life of coal-fired power plants ranges from 45th to 50th year. This means that, without the proposed amendments, some coal-fired power plants would have been able to continue operation well beyond the year 2030. In the government's view, the Canadian climate targets within the framework of the Paris Climate Agreement would have been more difficult to achieve. The new regulation provides that coal-fired power plants would have to meet this emission standard either at the end of their economic useful life or by the end of 2029. The Canadian environmental protection ministry estimates that 14 of the Canadian coal-fired power plant blocks would be affected by the proposed amendments intended to accelerate the exit from coal-fired power generation by 2030.

Owners and operators of coal-fired power plants can decide to meet the amended emission standard by installing a CO₂ capture and CO₂ storage facility. The Canadian government expect, however that most of the coal-fired plants will close at or before the end of their useful life, in any case by the year 2029, instead of attempting to meet the amended emission standard. They would be replaced by "cleaner" generation sources, as which natural gas as well as renewable energy sources is categorised.

Production

The production of steam and coking coal in Canada in 2017 was 1.6 % higher than in 2016 and at 62 million tonnes exactly at the level of 2015.

Exports

Canadian exports of 30.4 million tonnes break down into 2.0 million tonnes of steam coal and 28.4 million tonnes of coking coal. Overall, exports are at a stable level, and they rose slightly by 0.2 million tonnes (0.7 %) over 2016. The steam coal exports declined by 9.1 % while the significantly higher coking coal exports rose by 1.4 %.

Imported steam and coking coal quantities each came to just under 4 million tonnes. A total of 7.4 million tonnes was imported, 17.5 % more than in the previous year. The rise in steam coal of 24.1 % was even stronger.

The bottom line is an export balance of 23.0 million tonnes, 3.8 % below the level of the previous year (LB-T20).

Export/Import Balance Canada 2015 to 2017			
	2015 Mill. t	2016 Mill. t	2017 Mill. t
Exports Steam Coal	2.3	2.2	2.0
Exports Coking Coal	27.8	28.0	28.4
Total	30.1	30.2	30.4
Imports Steam Coal	3.7	2.9	3.6
Imports Coking Coal	3.9	3.4	3.8
Total	7.6	6.3	7.4
Export/Import Balance	22.5	23.9	23.0

Source: McCloskey

LB-T20

The largest purchasers of coking coal were Japan (6.7 million tonnes), South Korea (5.1 million tonnes; -10.3 %), The People's Republic of China (4.6 million tonnes; -10.3 %), India (3.1 million tonnes; +14.4 %), Taiwan (1.3 million tonnes) and Brazil (0.9 million tonnes).

In absolute terms, exports of steam coal are not very high, so it can easily happen that there can be extreme changes in the destinations in relative terms. This was the case in 2017. Deliveries to South Korea rose from less than 300 tonnes to 0.6 million tonnes, while deliveries to Japan fell by two-thirds from 1.4 million tonnes to 0.5 million tonnes.

1.5 million tonnes, solely coking coal, were exported to Germany.

Key Figures Canada			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Hard Coal Production ¹⁾	62.0	61.0	62.0
Hard Coal Exports	30.1	30.2	30.4
• Steam Coal	2.3	2.2	2.0
• Coking Coal	27.8	28.0	28.4
Imports Germany	1.3	1.5	1.5
• Coking Coal	1.3	1.5	1.5
Export Ratio	49 %	50 %	49 %
¹⁾ Incl. hard lignite			
Sources: MCR/DESTATIS/Own calculations			

LB-T21

POLAND

General

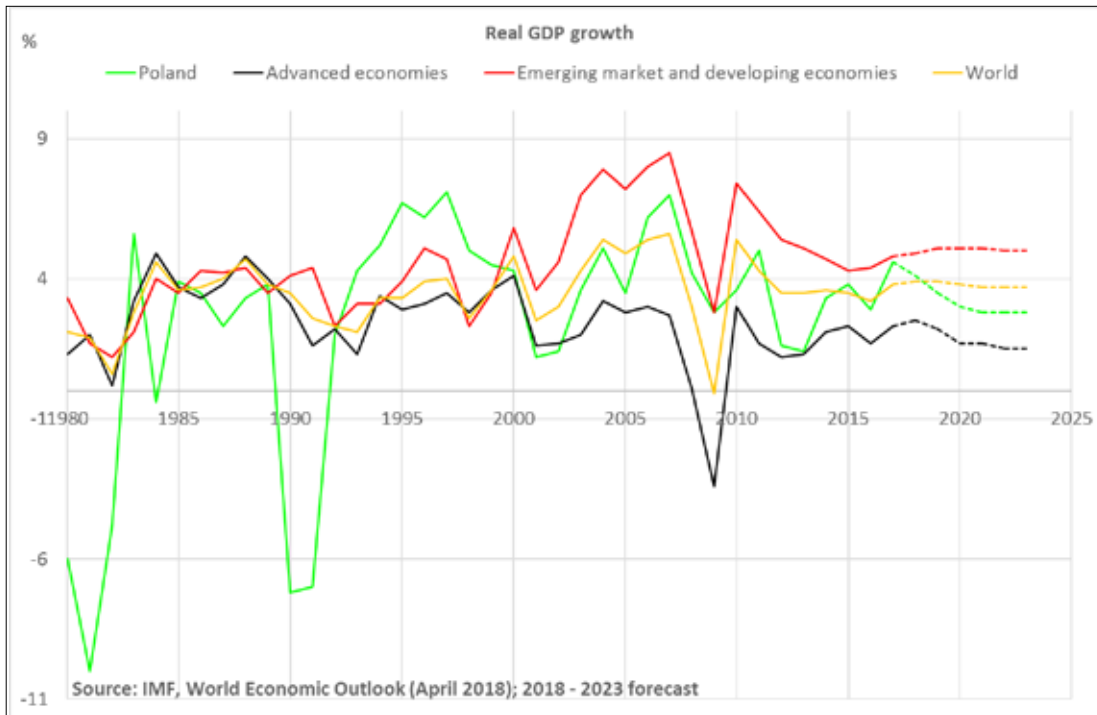
According to the IMF, Poland's real gross domestic product increased by 4.6 % in 2017 (WEO, April 2018). An increase of 4.1 % is projected for 2018. Per capita GDP in 2018 will



presumably amount to US\$ 13,820, above the world average of US\$ 11,730, but significantly below the average for developed national economies of US\$ 45,260. Real economic growth, on the other hand, goes well above the average of developed national economies and has been above or at the level of the global average since the slump in the 1990s.

Real Growth in Gross Domestic Product

In 2017, Polish power generation came from hard coal (46.0 %), lignite (31.1 %), renewable energies (13.9 %), miscellaneous (5.3 %) and natural gas (3.5 %). Coal still has a share of over three-fourths of electric power generation. During the 27th Economic Forum in Krynica-Zdrój on 5–7 September 2017, however, there were indications of a cautious turnaround in energy policies in Poland. Energy minister Krzysztof Tchórzewski declared at the conference that no new coal-fired power plants are being built in Poland. The three coal-fired power plants currently in construction or in the approval process would be the last of their kind. A low-emission pilot power plant based on the Japanese model is supposed to be built, however.



The plan is to build this power plant in the vicinity of the hard coal field near Lublin. The stock corporation Bogdanka, two-thirds of which belong to the Polish energy utility Enea, profitably produces annually about 9 million tonnes of hard coal at this site. The decision to build the model power plant near Lublin is also an indication that the geological conditions in the Upper Silesian coalfield are too unfavourable.

Minister Tchórzewski also announced the construction of several nuclear power plants at this conference. Three

nuclear power plants are to be built at five-year intervals. The first one is supposed to go into operation in 2029 and will cost €6 billion. The establishment of a gas hub in Poland was also discussed at the conference. Shell Poland would like to develop a central trading platform for Central and Eastern Europe with LNG deliveries from the USA and other countries. This change in attitude appears surprising, to say the least, because both President Andrzej Duda and the former prime minister Beata Szydło appeared to be committed to coal.

Production

According to information from the Polish Mining Chamber of Industry and Commerce, eight companies produce hard coal from 21 mines in Poland:

- Polska Grupa Górnicza (PGG), 9 mines
- Jastrzębska Spółka Węglowa (JSW), 4 mines
- Tauron Mining Inc., 3 mines
- Węglokoks Kraj Ltd Co., 1 mine
- Lublin Coal Bogdanka Inc., 1 mine
- PG Silesia Ltd Co., 1 mine
- EKO-PLUS Mining Plant Ltd Co., 1 mine
- Siltech Mining Plant Ltd Co., 1 mine

Twelve companies or parts thereof are under the umbrella of the restructuring company Mines Restructuring Company, Inc. Production continues to decline steadily. In 2017, 65.5 million tonnes of hard coal were produced, a decline of 7.0 % over 2016.

Apparently, understanding for the difficult situation of hard coal mining in Upper Silesia is growing in Poland. There are virtually no more low-cost reserves there. The last rescue plan for the Polish hard coal mining industry ultimately provided solely for a change of ownership (besides a few closures and the establishment of a restructuring company, see above) that would have imposed the obligation to invest in hard coal mining on the Polish electricity generators. The possibility or even the willingness of these companies to invest in hard coal mining, however, appears to be very limited at this time.

Consequently, investments in Polish hard coal mining continue to be too low, and the average production costs, according to calculations by Ewaryst Hille and

Andrzej Kassenberg, have been higher than the price of import coal in north-west Europe (CIF ARA) since 2012. They base these calculations on information from the Polish economics ministry and other sources. The results of their work have been incorporated into the study “Moving Poland Beyond Coal: Assessment of Potential and Strategy” for the Sierra Club. They must be considered to some degree with caution, however, because financing has become available from Bloomberg Philanthropies.

In the EURACOAL Market Report 1/2018, was a report of the development of a new mine in Nowa Ruda in Lower Silesia (Central Sudetenland, near the Czech border). Hard coal mining in this region came to an end in 1989 because production conditions were too unfavourable. The company Prairie Mining is continuing to pursue its projects in Lublin. They are in the immediate vicinity of the profitable Bogdanka mine and near the border to Ukraine.

Polish coke production fell by 5 % from 9.4 million tonnes in 2016 to 9.1 million tonnes in 2017. Coke production of this coke producer, for many years the largest in Europe, has remained virtually constant in recent years. In 2017, Germany overtook Poland as Europe's largest coke producer.

Infrastructure

The Polish railway company is battling with bottlenecks in the provision of freight capacities. In December 2018, Arcelor Mittal reported on bottlenecks in the supply of coking coal by the companies PGG (Polska Grupa Górnicza) and JSW (Jastrzębska Spółka Węglowa). The cause of the problem is not with these two com-

panies, however, but rather in the prioritisation of coal shipments for power plants by the Polish government to ensure power supply.

According to information from Arcelor Mittal, the company resolved this supply bottleneck in its coking coal supply by purchasing import coal.

Export and Import

For many years, Poland was a net exporter of hard coal, but this situation has changed several times in the recent past. In 2014, Poland was a net importer, but in 2015 and 2016 a net exporter. In 2017, the situation shifted substantially in favour of imports: they increased by 59 % to 13.2 million tonnes while exports declined by 24 % to 7.1 million tonnes.

Of the steam coal imports, 7.7 million tonnes (82.7 %) come from Russia, 10.6 % from Colombia and 3.2 % from the USA. Poland is importing steam coal again from the USA for the first time since 2015. In September 2017, Weglokoks reported that the first 75,000 tonnes from Hampton Roads were expected in Gdansk in the middle of October 2017. By the end of the year, four shipments in this magnitude had arrived.

Coking coal imports totalled 3.5 million tonnes: 48.9 % came from Australia, 16.8 % from Russia and 15.2 % from the USA. Of the anthracite imports (0.4 million tonnes). 90.9 % come from Russia.

Polish hard coal exports in 2017 fell by 23.7 % to 7.1 million tonnes. The largest customers for steam coal were the Czech Republic (1.5 million tonnes) and Germany (1.2 million tonnes), whereby the decline in Ger-

man imports by 50.3 % was massive. Poland's steam coal exports to Slovakia increased strongly by 81.8 %, but the starting level was very low.

Poland's Steam Coal Exports

	2016	2017	Change
	Mill. t	Mill. t	over PY
Total	6.77	4.36	-35.6 %
thereof:			
Czech Republic	1.54	1.50	-2.3 %
Germany	2.41	1.20	-50.3 %
Austria	0.45	0.50	11.7 %
Slovakia	0.24	0.43	81.8 %
Ukraine	0.28	0.25	-9.3 %

Source: IHS, DESTATIS

LB-T22

Poland's coking coal exports in 2017 increased by 12.9 % to 2.75 million tonnes. A major part of the coking coal went to the Czech Republic (1.6 million tonnes). There was a strong rise of 52.8 % in exports to Ukraine (0.4 million tonnes). Additional quantities went to Austria, Slovakia and Hungary.

Poland's Coking Coal Exports

	2016	2017	Change
	Mill. t	Mill. t	over PY
Total	2.44	2.75	12.9 %
thereof:			
Czech Republic	1.28	1.60	25.2 %
Ukraine	0.26	0.40	52.8 %
Austria	0.39	0.38	-4.6 %
Slovakia	0.41	0.35	-15.0 %
Hungary	0.08	0.03	-66.8 %

Source: IHS, DESTATIS

LB-T23

Because of the sale of stockpiles, coke exports also rose from 5.5 million tonnes (2016) to 5.9 million tonnes in 2017. Coke exports to Germany increased from 1.28 million tonnes to 1.42 million tonnes in 2017.

Change over PY			
	2015	2016	2017 ¹⁾
	Mill. t	Mill. t	Mill. t
Hard Coal Production	72.2	70.4	65.5
Hard Coal Exports	9.2	9.3	7.1
· Steam Coal	6.9	6.8	4.4
· Coking Coal	2.3	2.5	2.7
Coke Exports	5.5	6.0	5.8
Hard Coal Imports	8.3	8.3	13.2
Imports Germany	4.1	3.7	2.6
· Steam Coal	3.1	2.4	1.2
· Coking Coal	0.0	0.0	0.0
· Coke	1.0	1.3	1.4
Export Ratio in % (coke converted into coal)	20 %	22 %	20 %
¹⁾ Provisional Source: Various analyses			

LB-T24

PEOPLE’S REPUBLIC OF CHINA

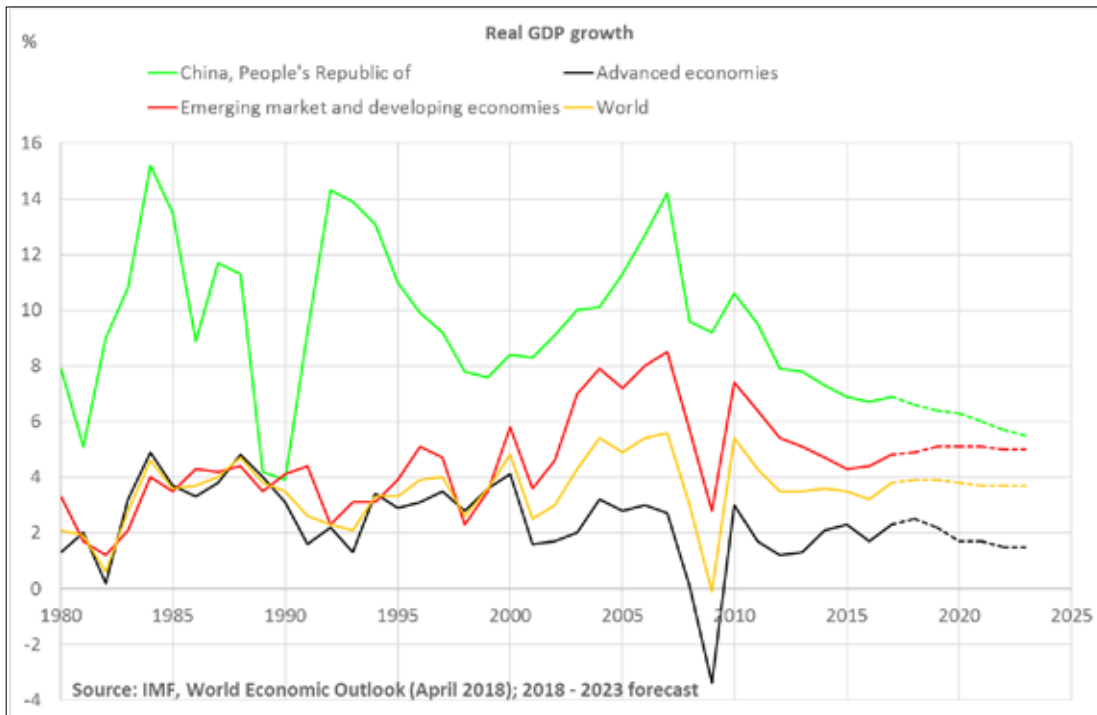
General

According to the World Economic Outlook of the IMF of April 2018, the gross domestic product of the People’s Republic of China rose by 6.9 % in 2017. An increase of 6.6 % is projected for 2018. This would put per capita GDP at US\$ 10,090, just under the world average of US\$ 11,730.



The IMF’s WEO of April 2018 expresses the expectation that China’s growth will slow down once again because credit growth and fiscal policy incentives are on the decline. While the expected recovery of investments will contribute to a rise in production potential, the weak productivity trends and the reduced growth on the labour market from the ageing of the population compromise the middle-term outlook in the advanced national economies in general – and the People’s Republic of China is no exception here.

The import restrictions recently announced by the USA led to the announcement of reprisals on the part of China. Possible reprisals by other countries are a cause of concern that the global economic mood could be harmed and darken the prospects for the global economy.



Real Growth in Gross Domestic Product

Chinese electric power generation increased by 6.5 % to 6,418 TWh in 2017. Renewable energy sources continue to grow – wind energy by 26.3 % and photovoltaics by 75.4 % – but the share of thermal power plants in electric power generation is still 70.9 % in comparison with 25.2 % from renewable energy sources (hydroelectric power 18.6 %, wind 4.8 %, photovoltaics 1.8 %). Coal is the source of 64.5 % of the share of power generation from thermal power plants (70.9 %). Hydroelectric power at 18.6 % makes up the dominant share of electric power

generation from renewable energy sources. In a system of fluctuating contributions from wind energy and photovoltaics, this is a great advantage because hydroelectric power can also play the role of the flexibilisation energy. While electric power generation from nuclear energy rose by 16.5 %, its share is still only 3.9 % and below that of wind energy.

Crude steel production rose by 2.9 % and pig iron production increased by 1.4 % in 2017.

China's Electricity/Crude Steel/Pig Iron Productio				
		2015	2016	2017
Electricity Generation	TWh	5,694	6,025	6,418
Crude Steel Production	Mill. t	798.8	808.4	831.7
Pig Iron Production	Mill. t	695.9	700.7	710.8
Source: world-steel, NBS				

LB-T25

Production

Hard coal production increased by 2.0 % from 3.45 billion tonnes (2016) to 3.52 billion tonnes in 2017 and has almost returned to the level of 2015 (3.54 billion tonnes). According to a report from the news agency Xinhua of 29 March 2018, the capacity of the Chinese hard coal mines was reduced by 250 million tonnes in 2017. Nevertheless, there is still a large number of small and obsolete mines: 3,000 mines have a capacity of less than 300,000 tonnes and almost 2,000 mines have a capacity of less than 90,000 tonnes. The Chinese government have announced that another 150 million tonnes would be taken off the market in 2018. The intention behind the closing below-average mines in the south of the country is to concentrate coal production on the regions Shaanxi, Shanxi and Inner Mongolia, which are rich in resources and competitive.

Capacity of 23 million tonnes in obsolete mines has been closed in Shanxi Province. Another 36 below-average mines are scheduled for closure in 2018. The result is that Shanxi Province has closed 52 mines with annual capacity of 46 million tonnes in the last two years. At the same time, there are plans to increase the capacity of modern

mines to 530 million tonnes by the end of the year so that now more than half of capacity is at a high technical level.

As a consequence of the closure of older and unsafe mines, coal production in China declined in 2016, in places significantly, even in the large mining provinces. In Shanxi, however, it increased slightly and rose by 8.7 % to 550 million tonnes in 2017. In the other two large mining provinces, growth was posted again in 2017: by 5.2 % to 856 million tonnes in Shanxi and by 3.9 % to 879 million tonnes in Inner Mongolia (LB-T26). The government actions to increase efficiency tend to go hand in hand with improvement in occupational safety and accident prevention. The competent government authority in Inner Mongolia, for instance, which produces one-fourth of the total Chinese hard coal, reported that the number of occupational accidents had declined by 45.5 %, the number of fatal accidents by 76.8 %, despite an increase in production of 3.9 %.

Strict safety inspections were carried out once again in May 2018. As of April 2018, the number of fatal accidents in the entire People's Republic had been reduced by 26.2 % in comparison with the previous year. In contrast, the number of occupational accidents increased by 21.4 % during the same period. This clearly shows that the measures for improvement of occupational safety have not been sustainably established in all Chinese provinces.

As of the end of 2017, there were about 7,000 mines in China. Another 1,156 mines with a capacity of 1 billion tonnes are under construction. When opened, 70 % of the total capacity will come from only 1,005 mines.

The Chinese government are striving to cover the demand for coal from modern and safe mines. At the same time, they are trying to counter an overheating of the domestic price level resulting from the capacity reduction for older mines. From the viewpoint of the planning authority, the National Development and Reform Commission (NDRC), the price increases observed in spring were fundamentally not justified, however. In May, the news agency Reuters reported that the Chinese government had, for the first time since 2016, again intervened directly in the market to prevent an increase in prices. During a meeting with the mining companies, the NDRC reportedly ordered the companies to lower the domestic spot price level from the current RMB 650 to RMB 570 (about US\$90) by 10 June 2018. In addition, it was strongly suggested to the companies that they should secure a supply of an additional 200 million tonnes to 300 million tonnes by concluding long-term contracts.

**Coal Production of the Three
Largest Mining Provinces in China**

	2014	2015	2016	2017
	Mill. t	Mill. t	Mill. t	Mill. t
Inner Mongolia	908	901	846	879
Shanxi	977	962	814	856
Shaanxi	511	502	506	550

Source: Statistical Offices of the Coal Provinces and Various Analyses

LB-T26

Infrastructure

At the beginning of 2018, Reuters reported on the Chinese government's infrastructure plans to expand the capacity of the national railway network by about 200 million tonnes in transport volume in this year, which

would correspond to a rise by 5 % over the previous year to a total Chinese railway transport volume of about 3.69 billion tonnes. Of this capacity expansion, 150 million tonnes are planned for the transport of steam coal alone. About two-thirds of the expansion programme for coal rail transport (100 million tonnes) is concentrated on the coal mining regions in Shanxi, Shaanxi and Inner Mongolia. The intent of the planning authority NDRC with this measure is to secure long-term the coverage of higher demand for coal and energy, especially in emergency situations arising from weather conditions (e.g. blocked road connections) and, in addition, to reduce environmental pollution by shifting transport from roads to rail. At this time, the greatest part of the national transport volume in China is carried on roads; last year, this was almost 37 billion tonnes. Similar to conditions in Russia, the shortage of bulk goods railway cars is a problem. The Chinese railway company is planning to solve this issue by purchasing the required railway cars, especially for the most important destinations from the coal mining regions to the consumption centres, e.g. for the routes Shaanxi-Szechuan, Shanxi-Eastern China and Inner Mongolia-Eastern China.

Import/Export

China is included in the Country Reports because the country was once a major export country. In 2017, China's gross export quota amounted to only 0.46 %, however. 8.1 million tonnes of coal as well as 8.1 million tonnes of coke were exported (LB-T27). The largest deliveries of steam coal in 2017 went to South Korea and Japan, each receiving 1.7 million tonnes. Of the coking coal exports, 0.7 million tonnes went to Japan and 0.6 million tonnes went to South Korea. Coke ship-

China's Import/Export Development				
	2015	2016	2017	Difference 2017/2016
	in Mill. t in Mill. t in Mill. t in Mill. t			
Imports Steam Coal*	107.9	124.1	118.7	-5.4
Imports Coking Coal	48	59.3	69.9	10.6
Total Imports	155.9	183.4	188.6	5.2
Exports Steam Coal*	4.2	7.4	5.8	-1.6
Exports Coking Coal	1.0	1.2	2.3	1.1
Exports Coke	9.8	10.2	8.1	-2.1
Total Exports	15.0	18.8	16.2	-2.6
* Incl. anthracite, excl. lignite Source: McCloskey CCR				

LB-T27

ments to India amounted to 1.6 million tonnes, and shipments to Japan came to 1.2 million tonnes.

Chinese imports of hard coal rose by 5.2 % in 2017 following +5.4 % in the previous year and amounted to 188.6 million tonnes. Steam coal imports declined by 5.4 % while imports of coking coal rose by 10.6 %. Imports fluctuated significantly over the course of the year. During the first quarter of 2017, they increased by one-third, and they continued to rise in the second quarter. There was a slight decline in the third quarter that grew stronger in the fourth quarter. Imports were restricted during this time.

In January 2018, import restrictions for Chinese ports were lifted in part. The purpose of this was to eliminate bottlenecks for some Chinese power plants. Among other factors, the cause was that the “switch” from coal to natural gas on the heating market planned by the government did not progress as planned. The natural

gas coming to China as LNG was not available in sufficient quantity to replace coal. In February 2018, coal stockpiles in the ports had been reduced to such an extent that the demand for imports rose further.

In February 2018, it became clear that the Chinese government would continue to attempt to stabilise the price for domestic coal by restricting imports. The port of Zhuhai Gaolan in Guangdong Province was one of the first to be affected by the restrictions. The costs incurred by the redirection of the ships to other ports or transshipment to other ships are not the only problems here. These actions also cause uncertainty among traders when making new deals. In addition, a price cap of RMB 750/t (US\$ 117/t; 5,500 kcal) was introduced for the very important port of Qinhuangdao. This price cap is reported to have been applied in other port cities as well.

The Chinese government have expanded the import restrictions already in effect even further. Additional ports have been included, and freights from overseas have been controlled more strictly. Most of the ports in Southern China are now the object of the one or other form of restrictions for all types of coal imports. Controls vary in type and scope, ranging from absolute import prohibitions to stricter customs regulations. The aforementioned increase in imports in Q1 2018 and high stockpiles in the ports are said to have led to these restrictions. On 1 April 2018, the first restrictions went into effect in the ports Kemen and Dongwu in Fujian Province. These ports were classified as “second-tier ports” with the consequence that they can be used only temporarily as import ports. It is possible that additional ports in this province will be classified in this category.

In view of the approaching winter, however, there will probably be a loosening of the restrictions in Q3 2018.

During a conference in April 2018, the Chinese planning authority National Development and Reform Commission (NDRC) indicated that it is currently not considering any further capping of the spot prices because it hopes that the price will soon return to the “acceptable range” on its own. Indirectly, the commission reinforced the view that it desires in any case adequate production capacity to guarantee the security of supply.

The largest import quantities for steam coal in 2017 came from Australia (47.4 million tonnes). It was followed by Indonesia (34.6 million tonnes), which also supplied 73.6 million (metric) tonnes of lignite. Coking coal was imported primarily from Australia (31.0 million tonnes) and Mongolia (26.3 million tonnes).

Key Data People's Republic of China ¹⁾			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Hard Coal Production	3,545	3,450	3,520
Hard Coal Exports	5.2	8.6	8.1
· Steam Coal	4.2	7.4	5.8
thereof anthracite	3.0	3.7	2.3
· Coking Coal	1.0	1.2	2.3
Coke Exports	9.8	10.2	8.1
Hard Coal Imports	155.9	183.4	188.3
· Steam Coal	83.1	97.7	105.0
· Coking Coal	48.0	59.3	69.9
· Anthracite	24.8	26.4	13.4
Imports Germany	0.12	0.14	0.18
Steam Coal (incl. Anthracite)	0.02	0.01	0.01
Coke	0.1	0.13	0.17
Export Ratio in % (coke converted into coal)	0.42 %	0.54 %	0.46 %

¹⁾Excluding lignite

Source: Various analyses, Mc Closkey

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VIETNAM

General

According to the country information portal of GIZ, Vietnam is comparable with Germany in terms of population and land area. After the end of the long war, Vietnam has experienced a rapid upswing since 1986 following the introduction of the market economy reforms (“đổi mới”).



The socialist economy of Communist Vietnam has undergone excellent development. And the single-party state Vietnam has succeeded in transforming itself from one of the world's poorest countries into an internationally recognised, aspiring emerging economy. According to the IMF, gross domestic product increased by 6.8 % in 2017 (WEO, April 2018), exceeding even the expectations of the Vietnamese government. An increase of 6.6 % is projected for 2018. This would mean per capita GDP of US\$ 2,550, still substantially below the world average of US\$ 11,730. But per capita GDP would also be below the level of developing and emerging countries of US\$ 5,490 and that of the ASEAN 5 countries (Indonesia, Malaysia, Philippines, Thailand, Vietnam) of US\$ 4,390.

Growth, on the other hand, is significantly greater than the level of the developing and emerging countries and even of the ASEAN 5 countries. The country is one of the most dynamic in Asia. There are still great structural differences in Vietnam, however. Especially small and mid-size Vietnamese operations still produce their goods using obsolete technology and with low labour productivity.

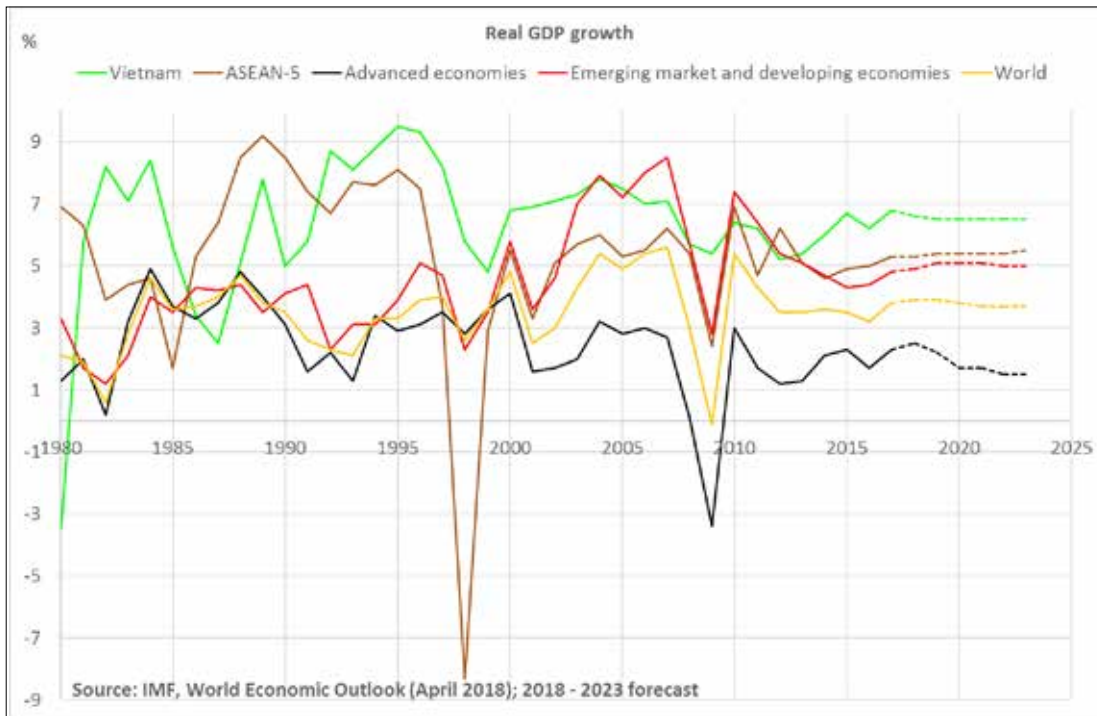
Real Growth in Gross Domestic Product

In 2018, Vietnam is in 68th place of out 190 countries in the Ease of Doing Business Index, ranks 55th out of 137 countries in the Global Competitiveness Index 2017–2018 and is 113th out of 176 countries in the Corruption Perceptions Index 2016.

According to Germany Trade & Invest (GTAI), Vietnam planned construction of 14 nuclear power plants in co-operation with Japan, Russia and South Korea so that it could cover its rising demand for energy. Construction for the first nuclear power plant in Ninh Thuan Province was originally scheduled to begin in 2014, but was postponed to 2020 for safety reasons. In 2016, however, the Vietnamese National Assembly decided to stop the plans for the construction of nuclear power plants because of the enormous rise in costs. In view of the sharply rising energy consumption, the Vietnamese government passed an energy efficiency act in 2011. Above all, however, energy needs are supposed to be covered using domestic coal deposits and by the construction of coal-fired power plants.

Export

Like China, Vietnam is included in the Country Reports because the country was once a major export country.



Owing to its strong economic growth, however, Vietnam's exports in recent years have continued to decline while domestic consumption and imports have risen. In 2017, imports fell slightly from 12.9 million tonnes to 11.6 million tonnes. This is contrasted by exports of 1.2 million tonnes. The export quota is now a mere 3.2 %. The primary suppliers of import coal are Australia and Indonesia, whereby the steam coal comes primarily from Indonesia (6.3 million tonnes). Australia supplied almost equal share of high-grade coking coal (1.4 million tonnes) and steam coal (1.7 million tonnes). Imports from Russia were primarily steam coal (1.7 million tonnes).

Key Figures Vietnam			
	2015	2016	2017
	Mill. t	Mill. t	Mill. t
Hard Coal Production	41.5	38.4	38
Hard Coal Exports	1.75	1.3	1.2
thereof China	0.7	0.5	0.25
Export Ratio in %	4.2 %	3.4 %	3.2 %
Imports	5.7	12.9	11.6

Source: verschiedene Auswertungen

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German notion for decimal separator and thousands separator was used for technical reasons:

- “,” corresponds to “.”
- “.” corresponds to “,”

World Energy Consumption by Energy Source and Region Mill. TCE

Energy Source	2010	2011	2012	2013	2014	2015	2016
Oil	5,754	5,836	5,913	5,970	6,074	6,188	6,312
Natural Gas	4,083	4,167	4,266	4,361	4,402	4,479	4,577
Nuclear Energy	900	859	800	805	822	833	846
Hydroelectric Power	1,100	1,136	1,191	1,231	1,263	1,276	1,300
Hard Coal and Lignite	5,080	5,189	5,320	5,524	5,587	5,485	5,331
Miscellaneous and Renewable Energies	162	286	342	404	452	521	599
Total	17,079	17,473	17,832	18,295	18,600	18,782	18,966
Primary Energy Consumption							Share in %
Consumption Regions	2010	2011	2012	2013	2014	2015	2016
North America	23.1	22.7	21.8	21.8	21.8	21.3	21.0
Asia/Australia	38.1	39.1	40.3	40.7	41.3	41.6	42.0
European Union	14.5	13.9	13.0	13.1	12.5	12.4	12.4
CIS	8.3	8.3	8.5	7.9	7.7	7.4	7.3
Rest of World	16.0	16.0	16.4	16.5	16.7	17.3	17.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Coal Consumption						Mill. TCE	Mill. TCE
(Hard Coal and Lignite)	5,080	5,189	5,320	5,524	5,587	5,485	5,331
Consumption Regions	2010	2011	2012	2013	2014	Share in %	Share in %
						2015	2016
North America	15.6	14.5	12.6	12.6	12.6	11.2	10.4
Asia/Australia	67.1	67.9	69.7	70.6	71.5	72.6	73.8
European Union	7.9	8.3	7.9	7.5	7.0	6.9	6.4
CIS	4.8	4.7	4.9	4.6	4.2	4.2	4.2
Rest of World	4.6	4.6	4.9	4.7	4.7	5.1	5.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Includes commercially traded energy sources only
Source: BP Statistical Review of World Energy Until 2016*

Table 1

World Hard Coal Production/Foreign Trade ¹⁾									Mill. t
	Production	2012 Export	Import	Production	2013 Export	Import	Production	2014 Export	Import
Germany	11	0	45	8	0	50	8	0	54
France	0	0	18	0	0	19	0	0	14
Great Britain	17	0	45	13	0	49	12	0	38
Spain ²⁾	6	0	21	4	0	13	4	0	15
Poland	79	7	10	77	11	11	73	9	10
Czech Republic	11	5	2	9	5	2	9	4	3
Romania	4	0	4	4	0	3	2	0	2
from 2013 EU 28	129	12	214	114	16	216	106	13	205
Russia	353	127	30	347	143	22	357	166	30
Kazakhstan	121	30	0	120	30	0	120	30	0
Ukraine	85	0	10	84	8	11	65	5	17
Designated Countries	559	157	40	551	181	33	542	201	47
Canada	67	35	10	69	39	9	69	34	8
USA	922	114	8	905	106	8	907	88	10
Colombia	89	81	0	86	75	0	89	77	0
Venezuela	3	3	0	2	2	0	2	2	0
Designated Countries	1,081	233	18	1,062	222	17	1,067	201	18
Republic of South Africa	260	76	0	256	73	0	261	77	0
Australia	366	316	0	410	358	0	441	387	0
India	580	0	129	554	0	161	612	0	215
PR China ³⁾	3,660	9	235	3,671	7	288	3,598	5	228
Japan	0	0	185	0	0	191	0	0	188
Indonesia ⁴⁾	386	304	0	342	335	0	389	348	0
Designated Countries	4,626	313	549	4,567	342	640	4,599	353	631
Other Countries	145	57	343	235	45	331	34	40	371
World	7,166	1,164	1,164	7,195	1,237	1,237	7,050	1,272	1,272

1) Domestic and seaborne trade, 2) Production incl. "Lignito Negro"
3) uction incl. lignite (estimated approx. 50 million tonnes), from 2013 excluding lignite, 4) Indonesia: Production incl. dom. lignite consumption, but excluding lignite exports, 5) Imports EU 28 include additional volumes from other countries of origin

Table 2

World Hard Coal Production/Foreign Trade ¹⁾									Mill. t
Production	2015 Export	Import	Production	2016 Export	Import	Production	2017 Export	Import	
8	0	56	4	0	57	4	0	51	Germany
0	0	14	0	0	14	0	0	16	France
9	0	27	4	0	9	3	0	9	Great Britain
3	0	19	2	0	15	3	0	19	Spain ²⁾
72	9	8	70	9	8	66	7	13	Poland
8	4	2	7	4	3		2	4	Czech Republic
2	0	2	2	0	2	2	0	2	Romania
100	4	192	89	13	169	78	9	174	from 2013 EU 28 ⁵⁾
372	151	22	384	162	22	408	186	20	Russia
107	30	0	102	30	0	106	29	0	Kazakhstan
40	8	15	41	8	14	35	6	20	Ukraine
519	204	37	527	204	36	549	215	40	Designated Countries
62	30	8	61	30	6	62	30	7	Canada
813	67	10	660	55	8	702	88	7	USA
86	83	0	91	90	0	89	86	0	Colombia
2	2	0	0	1	0	0	0	0	Venezuela
963	182	18	812	176	14	853	204	14	Designated Countries
252	77	0	250	76	0	252	83	0	Republic of South Africa
442	385	0	433	391	0	440	372	0	Australien
626	0	216	639	0	199	660	0	200	India
3,545	5	156	3,450	9	183	3,520	8	188	PR China ³⁾
0	0	191	0	0	191	0	0	187	Japan
413	327	0	402	311	0	415	318	0	Indonesia ⁴⁾
4,584	332	563	4,491	320	573	4,595	326	575	Designated Countries
158	55	385	211	38	451	229	29	441	Other Countries
7,018	1,224	1,195	6,813	1,214	1,243	6,996	1,244	1,244	World

Sources: Statistics from Kohlenwirtschaft, ECE, IEA, statistics of the importing and exporting countries, own calculations

Table 2

Hard Coal Seaborne Trade ³⁾									Mill. t
Exporting Countries	2012			2013			2014		
	Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total
Australia	145	171	316	171	188	359	186	201	387
USA	59	48	107	56	44	100	53	29	82
South Africa	1	75	76	0	73	73	0	77	77
Canada	30	4	34	35	3	38	31	3	34
PR China	1	8	9	1	6	7	1	5	6
Colombia	1	80	81	1	74	75	1	75	76
Indonesia ²⁾	0	304	304	0	335	335	0	348	348
Poland	0	3	3	0	6	6	0	3	3
Russia	8	109	117	15	116	131	33	110	143
Venezuela	0	3	3	0	2	2	0	2	2
Other	11	21	32	0	16	16	4	25	29
Total	256	826	1,082	279	863	1,142	309	878	1,187
Importing Countries/ Regions	2012			2013			2014		
	Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total
Europe ¹⁾ , thereof	42	193	235	43	190	233	70	140	210
EU 28 (from 2013)	37	149	186	38	156	194	64	104	168
Asia, thereof	139	601	740	194	658	852	199	694	893
Japan	52	133	185	48	143	191	43	145	188
South Korea	21	105	126	21	105	126	6	125	131
Taiwan	0	66	66	0	67	67	0	67	67
PR China	34	145	179	51	158	209	48	161	209
Hong Kong	0	12	12	0	13	13	0	14	14
India	31	98	129	54	107	161	37	178	215
Latin America	20	17	37	19	12	31	17	16	33
Other (incl. USA)	55	15	70	23	3	26	23	28	51
Total	256	826	1,082	279	863	1,142	309	878	1,187
<i>Figures excl. overland traffic</i>									
<i>1) Incl. neighbouring Mediterranean countries</i>									
<i>2) Indonesia from 2013 incl. lignite</i>									
<i>3) Rounding-off differences possible</i>									
<i>Assessment of various sources</i>									

Table 3

Hard Coal Seaborne Trade ³⁾										Mill. t
2015			2016			2017				
Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Exporting Countries	
184	201	385	189	202	391	171	201	372	Australia	
38	24	62	34	16	50	46	37	83	USA	
0	77	77	0	76	76	0	83	83	South Africa	
27	2	29	27	2	29	28	2	30	Canada	
1	4	5	1	8	9	2	6	8	PR China	
3	80	83	1	89	90	3	83	86	Colombia	
0	327	327	0	311	311	0	318	318	Indonesia ²⁾	
0	2	2	0	2	2	0	0	0	Poland	
17	118	135	22	131	153	23	140	163	Russia	
0	2	2	0	1	1	0	0	0	Venezuela	
0	19	19	0	2	2		2	2	Other	
270	856	1,126	274	840	1,114	273	872	1,145	Total	
2015			2016			2017				
Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Importing Countries/ Regions	
38	154	192	41	137	178	39	143	182	Europe ¹⁾ , thereof	
33	114	147	36	107	143	35	109	145	EU 28 (from 2013)	
206	643	849	202	638	840	199	669	868	Asia, thereof	
41	150	191	56	133	189	51	135	186	Japan	
25	110	135	33	98	131	31	109	140	South Korea	
0	66	66	11	56	67	11	54	65	Taiwan	
48	108	156	47	101	148	54	107	161	PR China	
0	11	11	0	11	11	0	10	10	Hong Kong	
47	169	216	49	146	195	48	149	197	India	
1	32	33	16	24	40	16	26	42	Latin America	
25	27	52	15	41	56	19	34	53	Other (incl. USA)	
270	856	1,126	274	840	1,114	273	872	1,145	Total	

Table 3

World Coke Production ¹⁾							1,000 t
Country/Region	2011	2012	2013	2014	2015	2016	2017
Europe	43,030	41,235	40,378	40,193	40,170	38,744	38,700
thereof:							
Germany	7,990	8,050	8,379	8,740	9,250	9,387	9,300
Poland	9,134	8,637	9,104	9,357	9,450	9,400	9,100
Russia	28,885	28,086	28,040	28,826	28,375	28,628	28,000
Ukraine	18,484	17,865	16,600	13,040	11,131	12,248	11,600
North America	19,632	19,230	19,214	18,235	16,749	14,200	14,800
Africa	2,618	2,404	2,301	2,413	2,092	1,824	2,000
Middle East (incl. Turkey ¹⁾)	5,135	5,459	5,186	5,388	5,885	5,580	5,600
Asia	504,767	516,894	552,084	558,491	527,754	530,039	512,150
thereof:							
China	427,790	441,620	473,050	476,910	447,780	449,110	431,400
Japan	35,400	34,700	35,200	34,200	32,400	33,159	32,700
South Korea	15,799	14,607	15,572	16,899	17,426	17,528	17,500
Vietnam	530	447	465	641	725	1,218	1,400
Indonesia	0	0	112	991	1,130	1,147	1,250
WORLD Total	640,855	649,746	681,186	684,894	650,363	649,127	633,000
<p><i>1) 2017 in part estimated.</i> <i>Source: CMR, Association information</i></p>							

Table 4

Grades of Steam Coal Traded on World Market							
Exporting Countries	Volatile %	Ash %	Tot. Moisture %	Sulphur %	Fine Coal Particles %	Grinding Hardness HGI	Calorific Value kcal/kg
Atlantic Suppliers							
USA (East Coast)	17 - 39	5 - 15	5 - 12	0.5 - 3.0	39 - 70	31 - 96	6000 - 7200
South Africa	16 - 31	8 - 15	6 - 10	0.5 - 1.7	51 - 61	43 - 65	5400 - 6200
Colombia	30 - 39	4 - 15	7 - 16	0.5 - 1.0	36 - 55	43 - 60	5000 - 6500
Venezuela ¹⁾	34 - 40	6 - 8	5 - 8	0.6	47 - 58	45 - 50	6500 - 7200
Poland ¹⁾	25 - 31	8 - 16	7 - 11	0.6 - 1.0	44 - 56	45 - 50	5700 - 6900
Czech Republic ¹⁾	25 - 27	6 - 8	7 - 9	0.4 - 0.5	58 - 60	60 - 70	6700 - 7100
Russia	27 - 34	11 - 15	8 - 12	0.3 - 0.6	47 - 58	55 - 67	5500 - 6200
Pacific Suppliers							
Australia	25 - 30	8 - 15	7 - 8	0.3 - 1.0	47 - 60	45 - 79	5900 - 6900
Indonesia	37 - 47	1 - 16	9 - 22	0.1 - 0.9	30 - 50	44 - 53	3700 - 6500
China ¹⁾	27 - 31	7 - 13	8 - 13	0.3 - 0.9	50 - 60	50 - 54	5900 - 6300
Russia (East Coast)	17 - 33	11 - 20	8 - 10	0.3 - 0.5	47 - 64	70 - 80	5500 - 6800
Vietnam/Anthracite ¹⁾	5 - 6	15 - 33	9 - 11	0.85 - 0.95	58 - 83	35	5100 - 6800
Germany	19 - 33	6 - 7	8 - 9	0.7 - 1.4	58 - 65	60 - 90	6600 - 7100
<i>Data in rough ranges</i> <i>Sourcen: Cf. Table 6</i> <i>¹⁾ Currently limited representation only on German market</i>							

Table 5

Grades of Coking Coal Traded on World Market						
Exporting Countries/ Grades	Volatile %	Ash %	Bound Moisture %	Sulphur %	Phosphorus %	Crucible Swelling Number FSI
Low Volatility						
Australia/NSW	21-24	9.3-9.5	1.0	0.38-0.40	0.03-0.07	6-8
Australia/QLD	17-25	7.0-9.8	1.0-1.5	0.52-0.70	0.007-0.06	7-9
Canada	21-24	9.5	0.6	0.30-0.60	0.04-0.06	6-8
USA	18-21	5.5-7.5	1.0	0.70-0.90	k.A.	8-9
Medium Volatility						
Australia/NSW	27-28	7.9-8.3	1.5-1.8	0.38-0.39	0.04-0.06	5-7
Australia/QLD	26-29	7.0-9.0	1.2-2.0	0.38-0.90	0.03-0.055	6-9
Canada	25-28	8.0	0.9	0.30-0.55	0.03-0.07	6-8
USA	26-27	6.8-9.0	1.0	0.95-1.10	k.A.	7-9
Poland ³⁾	23-28	7.0-8.9	0.7-1.5	0.60-0.80	k.A.	6-9
China ³⁾	25-30	9.5-10.0	1.3-1.5	0.35-0.85	0.015	
High Volatility						
Australia/NSW	34-40	5.5-9.5	2.4-3.0	0.35-1.30	0.002-0.05	4 - 7
Australia/QLD	30-34	6.5-8.2	2.0	0.50-0.70	0.02-0.04	8 - 9
Canada	29-35	3.5-6.5	1.0	0.55-1.20	0.006-0.04	6 - 8
USA	30-34	6.8-7.3	1.9-2.5	0.80-0.85	k.A.	8 - 9
Poland ³⁾	29-33	6.9-8.9	0.8-1.5	0.60-1.00	k.A.	5-8
Germany	26.6 ¹⁾	7.4 ¹⁾	1.5 ¹⁾	1.1 ¹⁾	0.01-0.04	7-8
<i>Data in air-dry ranges</i>						
<i>¹⁾ Coke application mixture</i>						
<i>²⁾ CSR value (coke strength under reduction) characterises the hot strength of the coke after being heated to 1,100° C and subsequent gassing with CO2 The CSR values assigned to the coal are guide values only.</i>						
<i>³⁾ Currently limited representation only on German market</i>						
<i>Sources: Australian Coal Report, Coal Americas, company information</i>						

Table 6

Grades of Coking Coal Traded on World Market

Coke Strength CSR Value ²⁾	Fluidity max. ddpmm	Contraction max. %	Dilatation max. %	Reflection mittl. %	Macerals		Minerals %
					reactive %	inert %	
50-65	500-2000	20-30	25-140	1,23-1,29	38-61	36-58	3-4
60-75	34-1400	24-34	35-140	1,12-1,65	61-75	20-34	3-5
65-72	10-150	20-26	7-27	1,22-1,35	70-75	20-35	5
60-70	30-100	25-28	30-60	1,30-1,40	65-75	20-30	3
40-60	200-2000+	25-35	0-65	1,01-1,05	50-53	43-44	4-6
50-70	150-7000	19-33	(-)5-240	1,00-1,10	58-77	20-38	3-4
50-70	150-600	21-28	50-100	1,04-1,14	70-76	20-24	5
60-70	500-7000	22-18	50-100	1,10-1,50	72-78	18-24	4
k.A.	k.A.	26-32	30-120	n,a,	k.A.	k.A.	k.A.
35-55	100-4000	27-45	(-)10-60	0,69-0,83	67-84	11-28	2-5
65-75	950-1000+	23-24	35-160	0,95-1,03	61-79	18-36	3-4
50-60	600-30000	22-31	50-148	1,00-0,95	76-81	17-19	2-4
60-70	18000-26847	26-33	150-217	1,00-1,10	75-78	18-21	4
k.A.	k.A.	k.A.	k.A.	n,a,	k.A.	k.A.	k.A.
50-65	30-3000	27-28	108-170	1,15-1,45	60-80	15-35	5

Table 6

Hard Coal Exports from Australia							
1,000 t							
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	4,280	4,451	4,739	5,673	5,737	6,608	5,634
France	2,363	2,719	3,317	3,219	3,707	3,860	2,779
Belgium/Luxembourg	1,179	992	444	39	1,610	231	914
The Netherlands	1,470	1,202	2,651	2,785	2,432	2,848	1,403
Italy	1,557	1,519	821	657	840	778	329
Great Britain	3,585	2,357	2,458	1,803	1,729	1,218	935
Denmark	0	0	0	0	0	0	0
Spain	1,337	1,118	1,062	1,438	1,401	1,197	870
Portugal	0	0	0	0	0	0	0
Sweden	1,092	1,057	1,056	1,079	1,311	1,363	790
Other	364	379	695	1,360	1,671	1,987	1,791
from 2013: EU 28	17,227	15,794	17,243	18,053	20,438	20,090	15,445
Israel	498	678	496	174	172	0	0
Turkey	787	1,221	311	633	1,987	1,505	570
Other Europe ¹⁾	0	0	0	0	0	86	122
Europe	18,512	17,693	18,050	18,860	22,597	21,681	16,137
Japan	106,171	113,626	123,811	120,186	125,619	121,648	117,432
South Korea	46,037	46,201	49,819	55,052	59,586	51,122	48,831
Taiwan	26,878	24,378	27,128	29,869	30,001	36,133	31,703
Hong Kong	895	679	446	518	488	307	292
India	30,224	32,071	34,813	46,826	48,114	48,468	44,263
PR China	34,000	62,894	87,923	93,351	71,416	74,898	83,203
Brazil	2,198	2,691	3,044	4,745	6,615	6,435	5,745
Chile	1,135	717	913	901	2,151	3,640	2,201
Other Countries	15,025	15,376	12,110	16,992	21,185	26,254	22,233
Total Exports	281,075	316,326	358,057	387,300	387,772	390,586	372,040
¹⁾ incl. neighbouring Mediterranean countries							
Source: McCloskey / DESTATIS							

Table 7

Hard Coal Exports from Indonesia							1,000 t
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	34	0	0	0	53	180	31
The Netherlands	927	71	15	0	83	0	271
Italy	4,882	3,692	3,365	3,516	3,106	1,686	891
Great Britain	390	0	0	0	0	0	0
Ireland	0	0	0	0	0	0	0
Denmark	0	0	0	0	0	0	0
Spain	1,877	5,634	3,392	4,071	4,826	4,944	3,232
Slovenia	559	332	k/A	k/A	240	377	398
Other	851	2,071	1,638	1,053	285	73	102
from 2013: EU 28	9,520	11,800	8,410	8,640	8,593	7,260	4,925
USA	1,180	469	650	1,390	732	562	664
Chile	483	160	0	0	0	0	874
Japan	24,950	31,800	26,010	32,050	32,406	33,038	31,421
South Korea	36,720	37,700	36,080	35,330	32,704	35,019	38,075
Hong Kong	8,650	11,673	11,100	10,970	9,267	9,424	8,450
Taiwan	19,090	19,600	22,110	21,980	24,008	20,290	17,454
Malaysia	11,880	12,600	12,140	12,250	16,505	17,272	21,130
Philippines	6,050	9,300	10,140	9,680	15,804	17,503	18,978
Thailand	6,780	11,421	8,440	16,467	17,730	16,384	16,375
India	52,800	60,520	82,720	104,740	123,365	94,609	98,553
PR China	77,950	83,300	106,940	88,180	36,684	50,843	47,294
Other Countries	13,836	13,657	77,260	40,323	9,362	9,021	14,112
Total Exports ¹⁾	269,889	304,000	402,000	382,000	327,160	311,225	318,305
¹⁾ From 2013 incl. lignite, from 2015 excl. lignite Sources: Company information, own calculations							

Table 8

Hard Coal Exports from Russia							
1,000 t							
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	10,731	11,227	12,841	13,494	16,528	17,947	19,740
Belgium/Luxembourg	0	0	2,620	2,304	1,694	1,299	833
Italy	2,346	2,600	4,406	4,341	4,023	1,860	2,299
Great Britain	11,592	14,600	17,748	16,200	7,374	2,292	3,882
Spain	1,917	2,300	2,196	2,157	5,012	2,463	4,072
Finland	5,111	2,700	3,586	3,784	2,063	1,926	1,976
Poland	1,389	1,700	1,300	1,303	607	5,268	7,641
Romania	438	450	460	460	489	464	1,169
Other	12,802	10,200	9,894	10,632	13,984	11,928	13,659
from 2013 EU 28	46,326	45,777	55,051	54,675	64,025	45,447	55,271
Turkey	8,180	9,785	8,580	8,460	11,091	11,496	13,707
Other	³⁾	³⁾	³⁾	³⁾	³⁾	267	348
Europe	54,506	55,562	63,631	63,135	75,116	57,210	69,326
Japan	11,608	15,292	8,422	14,519	16,824	18,544	17,022
South Korea	13,100	11,438	12,853	16,841	23,067	24,757	23,033
Taiwan	3,498	3,330	2,994	5,464	7,466	7,631	8,752
PR China	10,836	20,183	27,251	25,921	15,780	15,991	22,555
Other Countries ¹⁾	7,434	11,195	15,649	17,520	5,147	42,004	39,701
Total Exports ²⁾	100,982	117,000	130,800	143,400	143,400	166,137	180,389
¹⁾ 2008–2016 exports via Cyprus/Lebanon; part of these quantities were exported to other unknown countries.							
²⁾ Hard coal exports only (seaborne)							
³⁾ Import volumes are allocated to other countries							
Sources: MCR/DESTATIS/2008–2017 company information, own calculations, seaports' vessel tracking database							

Table 9

Hard Coal Exports from the USA							1,000 t
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	8,140	9,809	12,044	11,099	10,913	9,547	9,142
France	3,615	3,720	3,728	1,990	1,208	1,215	1,974
Belgium/Luxembourg	2,783	2,360	1,745	917	1,085	1,137	1,136
The Netherlands	5,908	7,178	4,352	4,571	4,441	2,847	3,807
Italy	5,070	7,747	5,981	5,331	3,112	1,733	2,850
Great Britain	6,283	10,856	11,986	8,898	3,811	965	2,476
Ireland	219	208	0	0	0	0	83
Denmark	146	0	0	0	41	55	108
Spain	1,551	1,975	1,430	1,357	1,151	1,263	1,590
Portugal	891	1,127	356	201	126	85	740
Finland	452	266	374	670	352	395	379
Sweden	633	613	438	651	585	262	658
Romania	937	607	819	370	246	179	192
Other	1,717	3,786	3,565	3,472	2,711	1,774	4,163
ab 2013: EU-28	38,345	50,252	46,818	39,157	29,782	21,457	29,298
Israel	0	17	0	0	0	0	1
Turkey	2,670	4,871	4,521	4,045	1,863	1,349	2,326
Other Europe ¹⁾	6,330	5,951	4,583	2,725	176	159	73
Europe	47,345	61,091	55,922	45,927	31,821	22,965	31,698
Canada	6,022	6,393	6,284	5,884	5,403	4,545	4,794
Mexico	2,526	3,126	5,102	4,267	3,412	2,807	3,387
Argentina	233	471	427	413	224	94	520
Brazil	7,867	7,206	7,742	7,233	5,750	6,294	6,859
Japan	6,209	5,169	4,783	4,475	4,224	4,133	6,957
South Korea	9,479	8,250	7,648	7,282	5,528	3,889	8,573
Taiwan	0	227	342	91	0	89	489
Other Countries	17,033	21,615	17,689	12,424	10,709	9,841	24,538
Total Exports	96,714	113,548	105,939	87,996	67,071	54,657	87,815
¹⁾ Incl. neighbouring							
Source: McCloskey							

Table 10

Hard Coal Exports (Steam Coal only) from Colombia							1,000 t
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	10,550	8,972	9,794	7,265	9,850	10,788	6,503
France	1,559	1,239	1,765	695	756	1,077	1,832
Belgium/Luxembourg	0	75	0	31	0	0	0
The Netherlands	10,925	13,053	10,305	8,503	8,463	6,748	3,267
Italy	1,815	1,916	1,264	1,205	2,661	3,561	2,609
Great Britain	5,238	6,365	6,195	6,867	4,100	598	329
Ireland	1,598	1,729	1,773	1,792	2,131	1,146	1,514
Denmark	5,654	3,153	1,927	1,248	574	548	158
Greece	480	0	0	0	0	0	0
Spain	3,079	4,340	2,981	6,067	5,869	4,653	5,707
Portugal	2,896	3,212	3,246	4,196	5,357	4,960	4,793
Finland	459	0	0	0	0	0	0
Sweden	1,169	0	0	0	0	0	0
Slovenia	77	214	222	238	165	633	567
Croatia	551	490	618	210	207	278	72
from 2013: EU 28	46,050	44,758	40,090	38,317	40,133	34,990	27,351
Israel	6,196	5,713	4,901	5,257	5,845	4,547	3,921
Turkey	5,631	7,935	7,660	9,300	11,414	16,115	17,031
Europe	57,877	58,406	52,651	52,874	57,392	55,652	48,303
Japan	145	220	278	0	20	240	1,949
Hong Kong	0	0	0	0	0	0	0
USA	6,928	5,029	4,511	5,565	6,341	5,649	3,944
Canada	1,488	1,125	1,593	1,516	1,711	1,445	1,733
Brazil	1,631	1,776	2,076	4,448	5,042	4,570	4,503
Other Countries	8,025	13,188	12,538	10,633	9,994	21,013	22,736
Total Exports	76,094	79,744	73,647	75,036	80,500	88,569	83,168
<i>Source: MCR / DESTATIS</i>							

Table 11

Hard Coal Exports from the Republic of South Africa							1,000 t
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	2,644	1,972	2,533	5,082	3,400	2,003	1,630
France	1,130	1,042	1,209	838	386	650	612
Belgium/Luxembourg	418	0	0	0	92	0	0
The Netherlands	888	1,760	4,754	4,919	2,150	1,199	314
Italy	3,599	3,242	2,297	1,516	3,883	2,799	833
Great Britain	663	592	441	1,128	299	117	0
Ireland	58	92	125	127	90	80	90
Denmark	1,378	630	300	686	326	433	322
Greece	0	75	0	0	40	0	0
Spain	2,447	2,360	1,698	3,211	2,400	1,092	2,785
Portugal	0	0	377	155	331	160	163
Finland	0	0	0	0	0	0	0
Other	174	316	358	178	33	258	128
from 2013: EU 28	13,399	12,081	14,092	17,840	13,430	8,791	6,877
Israel	3,318	4,752	3,306	2,503	2,559	1,003	1,166
Morocco	65	405	300	1,338	4,325	2,243	757
Turkey	2,748	2,795	2,836	3,668	4,548	1,570	1,867
Other Europe ¹⁾	165	124	0	64	0	38	34
Europe	13,564	12,205	14,092	17,904	13,430	8,829	6,911
Japan	617	468	550	145	150	0	311
South Korea	3,510	1,542	150	305	318	2,739	8,328
Taiwan	3,862	4,732	5,803	1,344	1,289	765	3,203
Hong Kong	0	0	0	0	0	0	0
India	17,135	22,985	20,894	30,574	35,299	37,567	36,511
PR China	12,238	12,871	13,535	3,260	0	60	0
USA	44	450	511	574	504	250	405
Brazil	995	1,114	631	1,014	944	879	998
Other Countries	17,422	19,373	17,188	21,268	25,326	24,357	26,275
Total Exports	69,387	75,740	73,354	76,388	77,260	75,446	82,942
¹⁾ Incl. neighbouring Mediterranean countries							
Sources: South African Coal Report, own calculations							

Table 12

Hard Coal Exports from Canada							1,000 t
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	1,736	1,516	1,214	1,462	1,317	1,487	1,524
France	104	55	0	31	0	92	119
Belgium/Luxembourg	55	0	0	0	0	25	0
The Netherlands	267	412	227	30	165	517	793
Italy	1,000	767	817	403	288	283	318
Great Britain	505	99	186	423	185	167	122
Denmark	0	0	0	0	0	0	301
Spain	120	1	58	1	2	63	35
Portugal	0	0	0	0	0	0	0
Finland	422	303	428	537	526	587	412
Sweden	0	60	0	0	22	0	246
Other	221	0	291	614	449	444	750
from 2013: EU 28	4,430	3,213	3,221	3,501	2,954	3,665	4,620
Turkey	182	500	567	551	834	1,039	659
Europe	4,612	3,713	3,788	4,052	3,788	4,704	5,279
Japan	9,265	9,526	10,108	8,850	8,306	7,914	7,240
South Korea	8,611	6,360	7,594	0	5,680	5,702	5,681
Taiwan	1,070	1,005	1,151	1,509	1,252	1,417	1,622
Brazil	2,281	1,813	1,677	2,263	1,113	901	926
USA	1,330	898	911	834	980	892	735
Chile	216	253	327	274	366	638	266
Mexico	400	183	278	158	130	0	132
Other Countries	5,602	10,761	12,712	16,320	8,505	8,077	8,560
Total Exports	33,387	34,512	38,546	34,260	30,120	30,245	30,441
<i>Sources: McCloskey, own calculations</i>							

Table 13

Hard Coal Exports from the People's Republic of China							1,000 t
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	11	9	8	23	16	140	184
France	0	0	0	0	0	0	0
Belgium/Luxembourg	0	0	0	0	0	1	0
The Netherlands	0	0	0	0	11	1	0
Italy	0	0	0	0	0	0	0
Great Britain	0	0	0	0	0	0	77
Spain	0	0	0	0	0	0	0
Greece	0	0	0	0	0	0	0
EU-28	11	9	8	23	27	142	261
Japan	6,222	3,989	3,020	2,070	1,503	2,667	3,132
South Korea	5,559	3,662	3,303	2,835	2,014	3,543	3,421
Taiwan	2,197	1,270	835	467	414	976	765
Hong Kong	1	0	0	59	0	1	0
India	173	0	0	0	2	1	172
Malaysia	6	0	0	4	15	17	8
Thailand	0	1	0	0	22	36	3
North Korea	205	172	129	80	71	132	44
Philippines	0	0	0	0	22	1	0
Brazil	0	0	0	0	0	0	90
Other Countries	127	24	18	59	1,099	1,128	162
Total Exports	14,501	9,127	7,313	5,597	5,189	8,644	8,058

Source: MCR and others

Table 14

Hard Coal Exports from Poland							1,000 t
Importing Countries	2011	2012	2013	2014	2015	2016	2017
Germany	2,659	2,406	3,007	2,931	3,098	1,521	1,248
France	10	212	534	0	228	157	0
Belgium	1	80	450	2	2	3	0
The Netherlands	0	0	147	54	51	159	0
Italy	0	0	0	1	65	7	24
Great Britain	634	89	665	230	123	51	26
Ireland	206	140	170	148	101	93	23
Denmark	60	60	553	365	150	141	5
Spain	20	20	19	26	25	25	8
Portugal	0	0	0	0	0	0	0
Finland	37	148	358	183	85	76	26
Austria	435	786	807	887	850	846	881
Sweden	84	105	184	117	100	85	32
Czech Republic	1,820	1,540	1,663	2,604	2,633	2,827	3,108
Slovakia	568	302	767	500	619	650	784
Hungary	133	98	93	58	163	169	186
Other	10	383	401	38	52	58	47
from 2013: EU 28	6,677	6,369	9,818	8,144	8,345	6,868	6,398
Other Countries	101	667	1,018	699	874	2,337	713
Total Exports	6,778	7,036	10,836	8,843	9,219	9,205	7,111
<i>Sources: McCloskey, German Federal Statistical Office and own calculations</i>							

Table 15

Hard Coal Imports of EU Countries – Imports Incl. Domestic Trade of Member States							1,000 t
	2011	2012	2013	2014	2015	2016	2017
Germany	44,200	44,900	50,100	53,600	55,500	55,000	49,000
France	15,300	17,000	18,300	14,300	14,300	13,500	15,700
Italy	24,000	25,000	20,800	20,000	19,600	17,900	15,300
The Netherlands	11,700	12,400	12,400	12,400	12,400	14,500	16,200
Belgium	4,000	3,500	5,200	4,400	4,200	3,700	3,600
Great Britain	31,700	44,800	44,800	38,300	25,500	8,500	8,500
Ireland	1,900	2,200	1,200	1,800	2,400	1,800	1,400
Denmark	6,100	3,900	5,000	4,500	2,800	2,900	3,100
Greece	600	200	200	200	300	300	400
Spain	15,300	22,300	13,500	14,700	19,000	14,700	19,200
Portugal	3,600	5,000	4,200	4,400	5,100	5,300	5,900
Finland	7,000	4,000	5,100	5,400	3,500	3,900	3,900
Austria	3,800	2,900	3,500	3,200	3,200	3,600	3,600
Sweden	2,700	2,200	2,500	2,500	2,700	3,100	2,700
Poland	15,500	10,100	10,800	10,300	8,200	8,300	13,400
Czech Republic	2,400	2,000	2,100	2,900	2,900	3,100	3,600
Hungary	1,500	1,500	1,300	1,300	1,300	1,500	1,500
Slovakia	3,400	3,400	7,100	6,700	4,100	4,000	3,800
Slovenia	500	600	500	400	400	400	400
Croatia	k.A.	k.A.	1,200	1,000	1,000	1,200	600
Bulgaria	3,300	2,300	1,700	1,600	1,100	700	900
Romania	1,200	1,300	900	700	1,200	1,000	900
Other EU 28 from 2013	199,700	2,000 213,500	3,100 215,500	204,600	800 191,500	168,900	173,600
	thereof Coke:	Coke:	Coke:	Coke:	Coke:	Coke:	Coke:
European Cross-Border Coke Trade (Excluding Ukraine)	8,000	8,000	6,000	6,000	7,600	8,000	9,000

Sources: EURACOAL/DESTATIS/Statistics from Kohlenwirtschaft

Table 16

Primary Energy Consumption in Germany							
Mill. TCE							
Energy Source	2011	2012	2013	2014	2015	2016	2017
Hard Coal	55.3	58.3	61.0	58.1	58.6	56.7	50.3
of which import coal	(43.4)	(46.8)	(52.4)	(52.1)	(51.3)	(53.6)	(48.5)
Lignite	53.3	56.1	55.6	53.6	53.5	51.8	51.5
Oil	154.8	154.9	158.3	154.1	153.2	155.3	159.5
Natural Gas	99.3	99.6	104.4	91.4	94.2	103.8	110.2
Nuclear Energy	40.2	37.0	36.2	36.2	34.2	31.5	28.4
Renewables	49.9	47.3	51.1	51.8	56.1	57.9	60.7
Foreign Trade Balance Electric Power	-0.8	-2.8	-4.2	-4.4	-6.4	-6.6	-6.7
Other Energy Sources	8.7	7.9	7.1	7.7	7.6	8.0	8.4
Total	460.7	458.3	469.5	448.5	451.0	458.4	462.3
							Share in %
Energy Source	2011	2012	2013	2014	2015	2016	2017
Hard Coal	12.0	12.7	13.0	13.0	13.0	12.4	10.9
of which import coal	(-9.4)	(-10.1)	(-11.0)	(-11.6)	(-11.4)	(-11.7)	(-12.3)
Lignite	11.6	12.2	11.8	12.0	11.9	11.3	11.1
Oil	33.6	33.8	33.7	34.4	34.0	33.9	34.5
Natural Gas	21.6	21.7	22.2	20.4	20.9	22.6	23.8
Nuclear Energy	8.7	8.1	7.7	8.1	7.6	6.9	6.1
Hydroelectric and Wind Power	10.8	10.3	10.9	11.5	12.4	12.6	13.1
Foreign Trade Balance Electric Power	-0.2	-0.5	-0.8	-1.1	-1.5	-1.4	-1.3
Other Energy Sources	1.9	1.7	1.5	1.7	1.7	1.7	1.8
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Sources: Arbeitsgemeinschaft Energiebilanzen, German Federal Statistical Office, own calculations							

Table 17

Coal Transshipments in German Seaports							1,000 t
	2011	2012	2013	2014	2015	2016	2017
Nordseehäfen							
Hamburg	5,805	5,111	5,629	5,924	7,672	7,434	7,697
Wilhelmshaven	1,924	1,597	3,301	3,112	4,093	2,480	3,536
Bremen Ports	1,599	1,783	1,270	1,636	1,710	1,175	1,175
Brunsbüttel	424	710	793	525	485	782	804
Nordenham	2,792	2,240	1,574	1,277	1,107	958	1,242
Total	12,544	11,441	12,567	12,474	15,067	12,829	14,454
Baltic Sea Ports							
Rostock	1,345	1,335	1,032	1,234	985	1,184	1,287
Flensburg	237	235	255	239	254	227	116
Kiel	271	503	178	325	231	158	72
Total	1,853	2,073	1,465	1,798	1,470	1,569	1,475
Total Transshipment	14,397	13,514	14,032	14,272	16,537	14,398	15,929
Source: German Federal Statistical Office							

Table 18a

Coal Transshipments in German Inland Ports 2017					1,000 t
Destination Port	Shipping Region			Total	
	Province Zuid-Holland ¹⁾	Province Noord-Holland ¹⁾	Province Antwerp		
Duisburg	7 980 573	1 920 431	497	9 901 501	
Lünen	1 549 352	10 794	-	1 560 146	
Karlsruhe	513 986	925 023	22 434	1 461 443	
Mannheim	1 307 553	7 177	67 712	1 382 442	
Rheinberg	480 492	872 033	15 459	1 367 984	
Hamm	601 746	693 469	-	1 295 215	
Saarlouis	296 893	387 158	454 413	1 138 464	
Bottrop	528 425	1 979	-	530 404	
Bergkamen	302 474	227 129	-	529 603	
Marl	58 241	349 935	-	408 176	
Ensdorf	-	348 550	-	348 550	
Heilbronn	129 522	191 927	6 439	327 888	
Frankfurt am Main	119 506	132 710	-	252 216	
Leverkusen	203 107	-	-	203 107	
Neuss	16 542	181 645	-	198 187	
Großkrotzenburg	170 781	-	-	170 781	
Herne	97 131	23 227	3 563	123 921	
Aschaffenburg	15 126	2 924	100 918	118 968	
Datteln	102 540	-	-	102 540	

¹⁾ Largest city: Rotterdam, ²⁾ Largest city: Amsterdam

Table 18b

Consumption, Import/Export and Generation of Electric Power in Germany

	2011	2012	2013	2014	2015	2016	2017
Gross Electricity Consumption in TWh	606.6	606.5	605.0	592.2	596.3	596.8	599.9
Foreign Trade Electricity in TWh							
Exports	56.0	67.3	72.2	74.5	85.4	80.7	83.3
Imports	49.7	44.2	38.4	38.9	33.6	27.0	28.4
Balance (Export Surplus)	-6.3	-23.1	-33.8	-35.6	-51.8	-53.7	-54.9
Gross Electric Power Generation in TWh	612.9	629.6	638.8	627.8	648.1	650.5	654.8
Use of Energy Sources for Electric Power Generation in TWh							
	2011	2012	2013	2014	2015	2016	2017
Hard Coal	112.4	116.4	127.3	118.6	117.7	112.2	92.6
of which import coal ¹⁾	(84.9)	(89.1)	(101.8)	(91.6)	(103.0)	(102.5)	(91.3)
Lignite	150.1	160.7	160.9	155.8	154.5	149.5	147.5
Natural Gas	86.1	76.4	67.5	61.1	62.0	81.3	86.5
Fuel Oil	7.2	7.6	7.2	5.7	6.2	5.8	5.9
Nuclear Energy	108.0	99.5	97.3	97.1	91.8	84.6	76.3
Hydroelectric/Wind Power	67.4	73.8	75.9	78.0	99.5	100.6	126.8
Other	81.7	95.2	102.7	111.5	116.4	116.5	119.2
Total	612.9	629.6	638.8	627.8	648.1	650.5	654.8
¹⁾ Procurements of power plants							
Sources: BDEW, Statistics of Kohlenwirtschaft, BAFA, AG Energiebilanzen, DIW, own calculations							

Table 19

European/International Prices							
	2011	2012	2013	2014	2015	2016	2017
Steam Coal Marker Prices 1%S, CIF NW Europa							
US\$/TCE	171.79	107.90	95.30	87.78	66.23	69.73	98.53
€/TCE	101.89	83.99	71.75	66.11	59.70	63.28	87.19
Source: McCloskey (converted from 6000 kcal/kg to 7000 kcal/kg)							
Sea Freight Rates Capesize Units to Destination Ports ARA (Amsterdam, Rotterdam, Antwerp)							
Australia (Queensland) US\$/t	16.62	13.81	15.88	14.95	8.49	7.54	10.65
Colombia (Bolivar) US\$/t	12.10	9.48	11.24	9.93	6.12	5.50	8.39
South Africa (Richards Bay) US\$/t	10.82	8.00	9.12	9.02	5.03	4.47	7.40
USA (Hampton Roads) US\$/t	11.59	9.78	11.36	10.32	6.45	5.83	8.74
Source: IHS Markit, own calculations							

Table 20

Hard Coal and Hard Coal Coke								1,000 t
Countries	2014				2015			
	Steam Coal*	Coking Coal	Coke	Total	Steam Coal*	Coking Coal	Coke	Total
Poland	2,925	6	1,458	4,389	3,097	1	998	4,096
Czech Republic	362	0	297	659	566	0	266	832
Spain	0	0	1	1	0	0	0	0
France	0	0	1	1	0	0	15	15
Other	5,489	35	450	5,974	2,951	36	318	3,305
EU-28	8,776	41	2,207	11,024	6,614	37	1,597	8,248
Russian Federation	12,312	1,183	227	13,722	14,885	1,643	196	16,724
Norway	435	0	0	435	561	0	0	561
USA	7,725	3,374		11,099	7,734	3,179	0	10,913
Canada	0	1,462	0	1,462	0	1,316	0	1,316
Colombia	7,265	116	0	7,381	9,850	98	0	9,948
South Africa	5,034	48		5,082	3,225	175	0	3,400
Australia	350	5,323	0	5,673	118	5,619	0	5,737
PR China	14	9	101	124	16	0	75	91
Indonesia	0	0	0	0	4	49	0	53
Venezuela	0	0	0	0	0	0	0	0
Other Third Countries	0	204	0	204	188	234	97	519
Third Countries	33,135	11,719	328	45,182	36,581	12,313	368	49,262
Total	41,911	11,760	2,535	56,206	43,195	12,350	1,965	57,510
Sources: German Federal Statistical Office, BAFA, own calculations					* Steam coal incl. anthracite			

Table 21

Imports to Germany								1,000 t
2016 ¹⁾				2017 ¹⁾				Countries
Steam Coal*	Coking Coal	Coke	Total	Steam Coal*	Coking Coal	Coke	Total	
2,419	2	1,284	3,705	1,247	1	1,425	2,673	Poland
393	0	146	539	160	0	281	441	Czech Republic
0	1	1	2	0	0	2	2	Spain
0	0	66	67	1	0	0	1	France
2,654	31	210	2,896	2,671	34	188	2,893	Other
5,467	35	1,707	7,208	4,078	35	1,897	6,011	EU-28
16,591	1,263	89	17,943	17,829	1,783	98	19,709	Russian Federation
621	15	0	636	171	0	0	171	Norway
6,651	2,896	0	9,547	5,779	3,362	0	9,142	USA
0	1,487	0	1,487	0	1,481	43	1,524	Canada
10,711	0	34	10,745	6,461	0	42	6,503	Colombia
1,809	194	0	2,003	1,429	201	0	1,630	South Africa
520	6,088	0	6,608	142	5,493	0	5,634	Australia
12	0	128	140	12	0	172	184	PR China
31	149	0	180	0	0	0	0	Indonesia
0	0	0	0	0	0	0	0	Venezuela
352	194	0	546	163	544	10	716	Other Third Countries
37,299	12,285	251	49,835	31,985	12,864	364	45,213	Third Countries
42,766	12,320	1,958	57,043	36,064	12,899	2,261	51,224	Total
¹⁾ Prepared base cumulative values from destatis								*Steam coal incl. anthracite

Table 21

Germany – Energy Prices/Exchange Rates							
	2011	2012	2013	2014	2015	2016	2017
Exchange Rates							
€/US\$	0.7184	0.7783	0.7530	0.7527	0.9013	0.9034	0.8852
Source: Deutsche Bundesbank							
Border-crossing Prices for Coking Coal and Hard Coal Coke – €/t							174.84 256.30
Imported Coking Coal	185.30	188.42	127.19	104.67	100.28	87.68	
Imported Hard Coal Coke	319.78	258.72	204.88	193.66	187.04	159.82	
Sources: From 2003, German Federal Statistical Office Hard coal coke German Federal Statistical Office							
Border-crossing Prices for Hard Coal in €/TCE: Use in Power Plants							
	Q1	Q2	Q3	Q4	Value for Year		
2011	105.30	105.22	106.22	110.44	106.97		
2012	100.21	93.09	92.01	86.62	93.02		
2013	84.03	80.03	75.64	76.66	79.12		
2014	75.16	71.18	71.21	73.41	72.94		
2015	71.99	69.64	66.10	64.06	67.90		
2016	56.87	56.12	65.03	88.28	67.07		
2017	95.75	86.40	88.07	94.07	91.82		
Source: BAFA Section 422 (border-crossing prices = CIF price ARA + freight German border)							
Energy Prices Free Power Plant €/TCE							
Energy Source	2011	2012	2013	2014	2015	2016	2017
Natural Gas	241.00	264.00	265.00	237.00	229.00	171.00	178.00
Heavy Fuel Oil	355.00	394.00	349.00	309.00	180.00	151.00	215.00
Steam Coal	112.00	98.00	84.00	78.00	73.00	72.00	97.00
Sources: BAFA, statistics from Kohlenwirtschaft, own calculations							

Table 22

The Hard Coal Market in Germany

Volumes and Prices 1957-2016

Quantities								Prices							
Imports of Hard Coal and Coke t=t				Domestic Production of Hard Coal Tonnes Usable Production				Steam Coal From Third Countries ¹⁾				Domestic Coal ²⁾			
Year	Mill. t	Year	Mill. t	Year	Mill. t	Year	Mill. t	Year	€/TCE	Year	€/TCE	Year	€/TCE	Year	€/TCE
1957	18.9	1987	8.8	1957	149.4	1987	75.8	1957	40	1987	46	1957	29	1987	132
1958	13.9	1988	8.1	1958	148.8	1988	72.9	1958	37	1988	42	1958	29	1988	134
1959	7.5	1989	7.3	1959	141.7	1989	71.0	1959	34	1989	49	1959	29	1989	137
1960	7.3	1990	11.7	1960	142.3	1990	69.8	1960	33	1990	49	1960	29	1990	138
1961	7.3	1991	16.8	1961	142.7	1991	66.1	1961	31	1991	46	1961	29	1991	139
1962	8.0	1992	17.3	1962	141.1	1992	65.5	1962	30	1992	42	1962	30	1992	147
1963	8.7	1993	15.2	1963	142.1	1993	57.9	1963	30	1993	37	1963	30	1993	148
1964	7.7	1994	18.1	1964	142.2	1994	52.0	1964	30	1994	36	1964	31	1994	149
1965	8.0	1995	17.7	1965	135.1	1995	53.1	1965	29	1995	39	1965	32	1995	149
1966	7.5	1996	20.3	1966	126.0	1996	47.9	1966	29	1996	38	1966	32	1996	149
1967	7.4	1997	24.3	1967	112.0	1997	45.8	1967	29	1997	42	1967	32	1997	149
1968	6.2	1998	30.2	1968	112.0	1998	40.7	1968	28	1998	37	1968	30	1998	149
1969	7.5	1999	30.3	1969	111.6	1999	39.2	1969	27	1999	34	1969	31	1999	149
1970	9.7	2000	33.9	1970	111.3	2000	33.3	1970	31	2000	42	1970	37	2000	149
1971	7.8	2001	39.5	1971	110.8	2001	27.1	1971	32	2001	53	1971	41	2001	149
1972	7.9	2002	39.2	1972	102.5	2002	26.1	1972	31	2002	45	1972	43	2002	160
1973	8.4	2003	41.3	1973	97.3	2003	25.7	1973	31	2003	40	1973	46	2003	160
1974	7.1	2004	44.3	1974	94.9	2004	25.7	1974	42	2004	55	1974	56	2004	160
1975	7.5	2005	39.9	1975	92.4	2005	24.7	1975	42	2005	65	1975	67	2005	160
1976	7.2	2006	46.5	1976	89.3	2006	20.7	1976	46	2006	62	1976	76	2006	170
1977	7.3	2007	47.5	1977	84.5	2007	21.3	1977	43	2007	68	1977	76	2007	170
1978	7.5	2008	48.0	1978	83.5	2008	17.1	1978	43	2008	112	1978	84	2008	170
1979	8.9	2009	39.5	1979	85.8	2009	13.8	1979	46	2009	79	1979	87	2009	170
1980	10.2	2010	45.2	1980	86.6	2010	12.9	1980	56	2010	85	1980	100	2010	170
1981	11.3	2011	48.4	1981	87.9	2011	12.1	1981	84	2011	107	1981	113	2011	170
1982	11.5	2012	47.9	1982	88.4	2012	10.8	1982	86	2012	93	1982	121	2012	180
1983	9.8	2013	52.9	1983	81.7	2013	7.6	1983	75	2013	79	1983	125	2013	180
1984	9.6	2014	56.2	1984	78.9	2014	7.6	1984	72	2014	73	1984	130	2014	180
1985	10.7	2015	57.5	1985	81.8	2015	6.2	1985	81	2015	68	1985	130	2015	180
1986	10.9	2016	55.2	1986	80.3	2016	3.8	1986	60	2016	67	1986	130	2016	180
		2017	47.9			2017	3.7			2017	92			2017	180

Figures: From 1991, incl. new German states; euro values rounded off

¹⁾ Price free German border

²⁾ Estimated breakeven price

Sources: German Federal Statistical Office, statistics from Kohlenwirtschaft, BAF, own calculations

Table 23

Members VDKI

Member Companies	Area	Phone	Fax	Website
AG der Dillinger Hüttenwerke <i>Werkstraße 1, 66763 Dillingen/Saar, Germany</i>	+49 6831	47-2220	47-3227	www.dillinger.de
Antwerp Port Authority <i>Zaha Hadidplein 1, 2030 Antwerp, Belgium</i>	+32 3	205 22 46	205 22 69	www.portofantwerp.be
AVALON Trading LP <i>Glasgow G2 4JR, 272 Bath Street</i>	+7 459	2870095	0044 203 0041 664	www.avalon.ms
BS/ENERGY Braunschweiger Versorgungs-Aktiengesellschaft & Co. KG <i>Taubenstraße 7, 38106 Braunschweig, Germany</i>	+49 531	383-0	383-2644	www.bvag.de
Bulk Trading S.A. <i>Piazza Molino Nuovo 17, 6900 Lugano, Switzerland</i>	+41	9161 15-130	9161 15-137	www.bulktrading.ch
CMC Coal Marketing Company Ltd. <i>Fumbally Square, Dublin DO8 XYA5, Ireland</i>	+353 1	708 2600	708 2699	www.cmc-coal.ie
Currenta GmbH & Co. OHG <i>CHEMPARK, Geb. G11, 51368 Leverkusen, Germany</i>	+49 214	3057885	30657885	www.currenta.de
DAKO Coal GmbH <i>Kämpenstrasse 151, 58456 Witten, Germany</i>	+49 2302	970 30 17	970 30 70	www.dako-coal.com
DB Cargo AG <i>Rheinstraße 2, 55116 Mainz, Germany</i>	+49 6131	15-61100	15-61199	www.dbcargo.com
Douglas Services GmbH <i>Rohrbergstr. 23 b, 65343 Eltville, Germany</i>	+49 6123	70390	703920	
EnBW AG <i>Durlacher Allee 93, 76131 Karlsruhe, Germany</i>	+49 721	63-23314	914-20071	www.enbw.com
Enerco bv <i>Keerweg 2, 6122 CL Buchten, The Netherlands</i>	+31 46	48 19 900	48 59 211	www.enerco.nl
enercity AG <i>Ihmeplatz 2, 30449 Hannover, Germany</i>	+49 511	430-0	430-2772	www.enercity.de
Engie Energy Management Trading <i>Simon Bolivarlaan 34, 1000 Brüssel, Belgium</i>	+32	2518 61 11	2501 59 06	www.engie.com
Ernst Russ Shipbroker GmbH & Co. KG <i>Neumühlen 9, 22763 Hamburg</i>	+49 40	380303-213	380303-399	www.russbroker.de
EUROKOR Barging B.V. <i>Gieterijstraat 93, 2984 AB Ridderkerk, The Netherlands</i>	+31 180	481 960	481 969	www.eurokorbarging.nl
Europees Massagoed-Overslagbedrijf (EMO) bv <i>Missouriweg 25, 3199 LB Maasvlakte RT, The Netherlands</i>	+31 181	37 1111	37 1222	www.emo.nl
EVN AG <i>EVN Platz, 2344 Maria Enzersdorf, Austria</i>	+43 2236	200 12352	200 82352	www.evn.at
Evonik Industries AG <i>Paul-Baumann-Straße 1, 45772 Marl, Germany</i>	+49 2365	49-6084	49-806084	www.evonik.de
Exxaro International Trading AG <i>Bahnhofstrasse 18, 6301 Zug, Switzerland</i>	+41 41	727 0570	727 0579	www.exxaro.com
Frachtcontor Junge & Co. GmbH <i>Burchardtstraße 8, 20095 Hamburg, Germany</i>	+49 40	3000-0	3000-343	www.frachtcontor.com
Freepoint Commodities Europe LLP <i>62 Buckingham Gate, London SW1E 6AJ, UK</i>	+44	203 262 6264	203 262 6900	www.freepoint.com

Members VDKI

Member Companies	Area	Phone	Fax	Website
GLENCORE International AG <i>Baarermattstrasse 3, 6341 Baar, Switzerland</i>	+41 41	709 2000	709 3000	www.glencore.com
Grosskraftwerk Mannheim AG <i>Marguerrestr. 1, 68199 Mannheim, Germany</i>	+49 621	8684310	8684319	www.gkm.de
HANSAPORT Hafenbetriebsgesellschaft mbH <i>Am Sandauhafen 20, 21129 Hamburg, Germany</i>	+49 40	740 03-200	74 00 32 22	www.hansaport.de
HCC Hanseatic Coal & Coke Trading GmbH <i>Sachsenfeld 3-5, 20097 Hamburg, Germany</i>	+49 40	23 72 03-0	23 26 31	www.hcc-trading.de
HMS Bergbau AG <i>An der Wuhlheide 232, 12459 Berlin, Germany</i>	+49 30	656681-0	656681-15	www.hms-ag.com
Holcim (Deutschland) AG <i>Willy-Brandt-Str. 69, 20457 Hamburg, Germany</i>	+49 40	360 02-0	36 24 50	www.holcim.com
HTAG Häfen und Transport AG <i>Neumarkt 7-11, 47119 Duisburg, Germany</i>	+49 203	47989-0	47989-193	www.htag-duisburg.de
ICT Coal GmbH <i>Katernberger Str. 107, 45327 Essen, Germany</i>	+49 201	860 44 61	860 44 65	www.ict-coal.de
IMPERIAL Shipping Holding GmbH <i>Dr.-Hammacher-Str. 49, 47119 Duisburg, Germany</i>	+49 203	5794-0	5794-229	www.imperial-shipping.com
Incolab Services B.V. <i>Röntgenstraat 3, 3261 LK Oud Beijerland, The Netherlands</i>	+31 186	610 355	610 552	www.incolab.com
Inspectorate Deutschland GmbH <i>Daimlerstr. 4a, 47167 Duisburg, Germany</i>	+49 203	860 967-13	860 967-20	www.inspectorate.com
JERA Trading Pte. Ltd. <i>Kurfürstendamm 194, Haus Cumberland, 10707 Berlin, Germany</i>	+49 30	700 140 460	700 159 510	www.jeratrading.com
Knight Energy Services Ltd. <i>Unit 1, Palmermount Ind. Estate, Bypass Road, Dundonald, Kilmarnock, Ayrshire, KA2 9 BL, UK</i>	+44	1563 850 375		www.ahkgroup.com
L.B.H. Netherlands B.V. <i>Rijdsdijk 13, 3161 HK Rhooon, The Netherlands</i>	+31 10	506 50 00	501 34 00	www.lbh.nl
Niederrheinische Verkehrsbetriebe Aktiengesellschaft (NIAG) <i>Rheinberger Str. 95 a, 47441 Moers, Germany</i>	+49 2841	205 528	999 398 544	www.niag-online.de
OBA Bulk Terminal Amsterdam <i>Westhavenweg 70, 1042 AK Amsterdam, The Netherlands</i>	+31 20	5873701	6116908	www.oba-bulk.nl
OVET B.V. <i>Mr F.J. Haarmanweg 16 d, 4538 AR Terneuzen, The Netherlands</i>	+31 11	5676700	5620316	www.ovet.nl
Oxbow Coal GmbH <i>Renteilichung 44a, 45134 Essen, Germany</i>	+49 201	439 529-0	439 529-50	www.oxbow.com
Pfeifer & Langen GmbH & Co. KG <i>Dürener Str. 40, 50189 Elsdorf, Germany</i>	+49 2274	701-300	701-293	www.pfeifer-langen.com
Port of Amsterdam <i>De Ruijterkade 7, 1013 AA Amsterdam, The Netherlands</i>	+31 20	523 45 77	523 40 77	www.portofamsterdam.nl
Port of Rotterdam <i>Wilhelminakade 909, 3072 AP Rotterdam, The Netherlands</i>	+31 10	252 1638	252 4041	www.portofrotterdam.com

Members VDKI

Member Companies	Area	Phone	Fax	Website
PSB Inspection B.V. <i>James Wattweg 2 c, 3133 KK Vlaardingen, The Netherlands</i>	+31 10	31 38 907		www.psbinspection.com
RAG Verkauf GmbH <i>Shamrockring 1, 44623 Herne, Germany</i>	+49 2323	15-5410	15-5412	www.rag-verkauf.de
Rheinbraun Brennstoff GmbH <i>Stüttgenweg 2, 50935 Köln, Germany</i>	+49 221	480-1364	480-1369	www.rheinbraun-brennstoff.de
Rhenus PartnerShip GmbH & Co. KG <i>August-Hirsch-Str. 3, 47119 Duisburg, Germany</i>	+49 203	8009-326	8009-221	www.rhenus.de
RWE Supply & Trading GmbH <i>Altenessener Str. 27, 45141 Essen, Germany</i>	+49 201	12-09	12-17900	www.rwetradng.com
SEA-Invest N.V. <i>Skaldenstraat 1, 9042 Gent, Belgium</i>	+32 9	255 02 51	259 08 93	www.sea-invest.be
Ssp Stockpile surveying and protection B.V. <i>Reedijk 7u, 3274 KE Heinenoord, The Netherlands</i>	+31	180 55 65 61	180 55 62 89	www.ssp-rotterdam.nl
Stadtwerke Flensburg GmbH <i>Batteriestraße 48, 24939 Flensburg, Germany</i>	+49 461	487-0	487-1880	www.stadtwerke-flensburg.de
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Published by:

Verein der Kohlenimporteure e. V.

10117 Berlin, Unter den Linden 10

Phone: +49 (0) 30 700 140 258

Fax: +49 (0) 30 700 140 150

e-Mail: info@kohlenimporteure.de

Website: www.kohlenimporteure.de

Die englische Version dieses Jahresberichtes
steht ab Oktober 2018 auf der Homepage zum Download bereit.

Design & Layout: abcdruck GmbH, Germany
Print: abcdruck GmbH, Germany

(ISSN 1612-5371)