

## ***The Shrinking Geographies of Coal: European Pathways in a Global Context***

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*This contribution aims at highlighting trends that are affecting coal's geography at different levels (world, European and regional ones). To reach the emission targets agreed in the Paris Agreement (2015), coal's decline looks necessary but it still contributes for almost half of power production. Coal's geography is however shrinking albeit at a different pace around the world with Asia remaining a key consumer and supplier and European countries being for most of them committed to phase it out. China produces and consumes around 40 percent of the coal extracted while most of the EU Member States have either phased-out coal or have committed to do so. Different EU policy instruments aiming at lowering GHG emissions are affecting cost-effectiveness of coal fired power-plants.*

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To reach the emission targets agreed in the Paris Agreement (2015), coal's decline looks necessary but is actually the main source of electricity production worldwide. Whether a sharp decline is likely or not in the years to come remains unknown as contradictory signals have emerged, especially in the context of the 2020 pandemic.

Coal consumption decreased by 1.2 percent in 2019 but it still contributes for almost half of power production (40 percent) globally and is responsible for 40 percent of the Greenhouse Gases (GHG) emissions of the energy sector. Climate international negotiations do not seem to have had a significant impact on its use. During the 3 years following the adoption of the Kyoto protocol (1997-1999), coal use declined but mainly because of the financial crisis. Between

2000 and 2013, consumption increased again. In 2018, three years after the Paris Agreement, the volumes extracted reached a historic high. Three of the six main world producers posted an unprecedented level of production (India, Indonesia, Russia) and coal became in Australia the first raw material exported (IEA, 2020a).

However, coal's future looks bleak. Cost reductions and policy support in several major economies are driving a strong renewables growth. Solar photovoltaics (PV) and onshore wind are already the cheapest ways of adding new electricity-generating plants in most countries today (IEA, 2020b). Whenever low interest rates are available in addition to appropriate solar and wind resources, fossil fuel and especially coal are challenged. Following the pandemic, renewables are set to account for 95 percent of the net increase in global power capacity through 2025. According to IEA, installed wind and solar PV capacity is on course to surpass natural gas in 2023 and coal in 2024. Should such a scenario prevail, renewables would overtake coal to become the largest source of electricity generation worldwide in 2025 (hydropower supplying almost half of global renewable

electricity). Another competitor is gas which availability is benefiting from Liquefied Natural Gas (LNG) supply and from abundant reserves, in particular in the context of shale gas production in the USA.

Coal's share in the world energy mix could decrease further in the context of net-zero emission targets adopted in 2019 and in 2020 in several key markets. Following the EU (European Union) Green Deal<sup>1</sup> and its commitment to reach climate neutrality by 2050, three major Asian economies announced in 2020 targets for reaching climate or carbon neutrality: Japan and South Korea by 2050, China by 2060.

Against such a background, coal's role in the energy production is set to decline. Coal's geography is indeed shrinking albeit at a different pace around the world with Asia remaining a key consumer and supplier and European countries being for most of them committed to phase it out. This raises questions not only on alternative sources that will ensure security of supply but also on the consequences for cities and regions that have been for decades heavily reliant on coal mining and/or on coal use for energy supply. Hence the need for a multi-scalar approach of this shrinking geography of coal in order to highlight spatial dynamics at the global level as well as at the EU, national and local level. This contribution investigates this process of reconfiguration of the world's coal geography before providing an outlook on the specific processes at work in Europe where coal phasing-out is well underway.

## Europe's declining role in the world coal geography

The generation of electricity and heat is the main use of primary coal (over two-thirds of it is used for this purpose) although its share is decreasing in several economies, especially in Europe, in China and in the USA. Coal is also crucial for the iron and steel industry and its use has increased

substantially during the last thirty years, driven primarily by the strong economic growth in China.

A historical perspective shows that the geography of supply has dramatically changed since the 70s, especially in the case of Europe (Figure 4). Whereas in 1973, half of the ten first suppliers of coal were European countries, only one is European in 2018<sup>2</sup>. This reflects not only the increasing production in Asian countries but also the sharp decline of production in Western Europe. Globally, coal production is still on the rise. It increased by 1.5 percent in 2019 the growth in Chinese production equalling the drop recorded in EU and US production since 2018. China and Indonesia posted an annual growth while India reduced production for the first time

Newly commissioned coal-fired capacity by year, GW

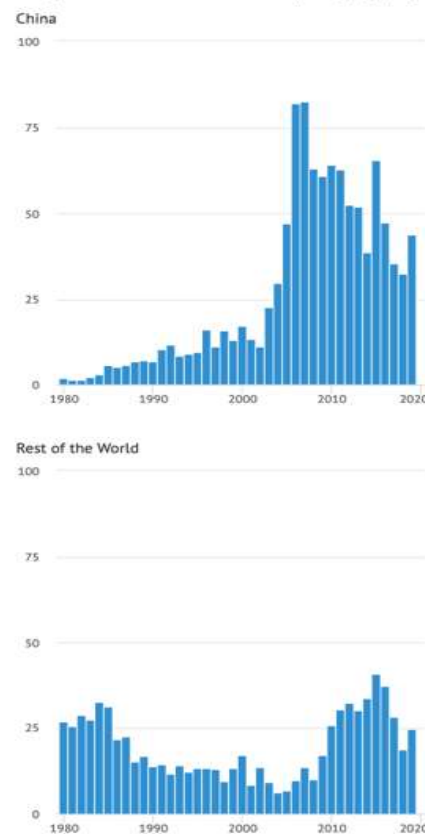


Figure 6 Coal-fired capacities installed yearly in China and in the rest of the world.

Source : <https://energypost.eu/will-china-build-more-coal-to-stimulate-the-economy/> (accessed on 5 Nov. 2020)

<sup>1</sup> European Commission, A European Green Deal, striving to be the first climate-neutral continent: [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en). Accessed on 12th November 2020.

<sup>2</sup> IEA Atlas of Energy : <http://energyatlas.iea.org/#/tellmap/2020991907/0>. Accessed on 8th November 2020.

this century and only for the second in history (IEA, 2020b).

Geographies of coal slightly differ depending on whether the focus is put on production, consumption or exports but a few economies play a key role: China, the United States, Australia. Half of world production is provided by China, followed by India (9 percent), the United States, Australia and Indonesia. These five countries accounted for nearly 80 percent of global coal production in 2019.

When it comes to consumption, China is leading too, again with half of the world consumption. Altogether China, the United States and India accounted for around 75 percent of it in 2019. China used to have the largest impact on changes in global coal consumption figures, but it was Indonesia that in 2019 increased the most its coal consumption over the previous year. Whereas Asia is set to remain the main market in the years to come, the United States and the EU set historical minimum consumption in 2019.

In terms of exports, Indonesia and Australia currently account for more than half of the global exports, with the proportion growing to two-thirds if Russia is included, ahead of Colombia, the United States and South Africa. This geography of exports has significantly changed over the last thirty years. In 1990 Australia and the United States were the main exporters with around one-fifth each. Russia's share increased after 2000, and newcomers such as Mongolia and Colombia have posted strong growth of their exports. However, the strongest growth over the past 30 years has come from Indonesia, which now accounts for almost one-third of the global coal exports market.

Regarding importing countries, China and India are the biggest importers. China buys one-fifth of the coal put on the international market every year and together with India, Japan, South Korea they absorb around half of the imports. Whereas India, China, Vietnam have seen their imports increasing significantly, the EU which used to be a major importer in 1990 has been reducing its coal imports consistently since then. Its share in global

imports is around 10 percent against 35.4 percent thirty years ago. Although coal has been at the core of the industrial revolution in Europe, this continent has become of secondary importance in the World's coal's geography while Asia has become the main supplier and consumer pole.

### *Asia has become by far the biggest market for coal*

Coal's future depends indeed mainly on Asian markets and policy makers, Asia accounting for 75 percent of global demand. In several countries, the sector still benefits from substantial financial support, from private banks as well as from the local and national authorities.

Chinese economic growth has been underpinned by a strong increase of coal use, which consumption increased in twenty years (1990-2018) from less than one billion tonnes to 4 billion. While its share in the energy mix is declining, it was still close to 60 percent in 2018. Between 2011 and 2019, China consumed more coal than the rest of the world considered as a whole. Stimulus plans have indeed traditionally benefited heavy industry so that each phase of economic crisis has been followed by a surge of coal consumption and thus of emissions (Figure 5). Coal is not only a cheap provider of energy but also a contributor to China's energy security since the country can rely on the 3rd world largest reserves. With a sharp increase of consumption during the last three decades, imports have risen but they cover less than 10 percent of the country's needs.

This coal-based growth largely explains the pollution in cities as well as the country's contribution to global warming. In 2017, 81 percent of China's emissions came from coal use (70 percent in the case of India, 28 percent in the US, 29 percent in the EU) (IEA, 2020). However, profound changes cannot be ruled out. Plant utilization rate is low, environmental problems acute (Cui et al., 2020) and half of thermal power

plants are not profitable<sup>3</sup>. Uncertainty remains regarding the likely scenarios for the years to come. In the context of the Paris agreement, China pledged to reach its emissions peak by 2030 or before and to reduce by this year the carbon intensity (emissions per unit of GDP) of 60 - 65 percent compared to 2005. In 2020, it committed to carbon neutrality (not to climate neutrality) by 2060.

However, in a speech devoted to the energy security strategy in October 2019, Prime Minister Li Keqiang's stressed the key role to be played by coal<sup>4</sup>. In March 2020 alone, the authorities approved the construction of 7.9 GW of coal-fired power plant capacity, more than 6.3 GW for the whole year 2019<sup>5</sup>. The fleet of coal-fired power stations is young (fourteen years on average) and the coal deposits are located in regions lagging behind, two factors that add to the reasons why a fast phasing-out of coal might be difficult to achieve (R. Balme, G. Romano, 2014).

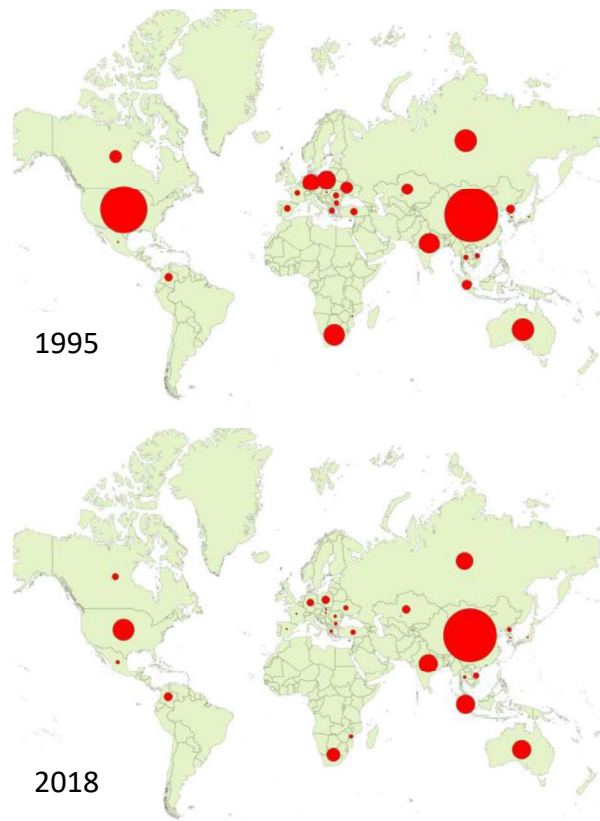


Figure 7 Spatial distribution of coal supply  
Source : IEA



Financing coal-fired power plants is also becoming increasingly difficult. Private banks, including in Asia, are concerned about being portrayed as ignoring climate concerns. In 2018, they financed 3/4 of wind and photovoltaic projects in India while 2/3 of mining projects got support from public banks<sup>6</sup>. Between 2005 and 2015, Indian public banks provided 82 percent of the financing of coal-fired power plants<sup>7</sup>. Taking into account the numerous coal fired plants built recently as well as projects in the pipeline, phasing-out could prove difficult and risky, with the rise of stranded assets on balance-sheets of private and public banks.

<sup>3</sup> Stephanie Pfeifer, chief executive of the Institutional Investors Group on Climate Change, quoted by David Stanway, 'China coal-fired power capacity still rising, bucking global trend', Agence Reuters, 20th November, 2019.

<sup>4</sup> 'China vows to upgrade energy production, consumption, ensure energy security', Xinhua, 11th October 2019, [http://www.xinhuanet.com/english/2019-10/11/c\\_138464713.htm](http://www.xinhuanet.com/english/2019-10/11/c_138464713.htm). Accessed on November 3rd 2020.

<sup>5</sup> Global energy monitor: <https://globalenergymonitor.org/coal/>. Accessed on 5th November, 2020.

<sup>6</sup> 'Asian governments are the biggest backers of the filthiest fuel', The Economist, 22nd August, 2019.

<sup>7</sup> 'Down and dirty', The Economist, 22nd August, 2019.

*Russia, a key provider to Asia and to Europe*

Countries neighbouring China have been benefiting from the Chinese demand for coal. In Russia (where the biggest world coal reserves are located), the Kuznets basin (Kuzbass) in the Kemerovo region provide 60 percent of national production, ahead of the Kansk-Achinsk coal basin in the Krasnoyarsk region, with the remainder of production coming from the Russian Far East where production takes advantage of rail connections to China. More than half of Russia's exported coal goes to the EU but China and South Korea are increasingly significant customers.

This growing importance of Asia has induced a modernization of the seaports in the Far East (Vanino, Posiet, Murmansk<sup>8</sup>, Vostochny). Before reaching these ports, coal is transported by rail for at least 4,000 km at a cost that undermines its competitiveness. To serve Asian markets, coal mines located in the Far East have therefore a role to play but coal extracted there is of lower quality. The Transiberian express and the BAM (Baikal Amour) are being modernized, with China providing financing for the infrastructure and for coal-mining activities (for example in the Ogodzhinskoye region, which borders China). China has also built-up a partnership with Mongolia.

Other suppliers of China such as Indonesia and Australia have become the world's top coal exporters<sup>9</sup>. Despite the narratives and the policy decisions put forward in the name of climate mitigation, some countries have indeed seen their exports of coal growing significantly. Australia, South Africa, the Philippines saw exports tripled between 2018 and 2019. Mozambique is competing with Australia for supplying the Indian market from the ports of Beira and the new port of Nacala. Unless a sudden shift occurs on Asian markets (especially in India

and in China), coal's decline might require some time whereas data regarding the US market show a bleak outlook there.

*A bleak outlook on the US market*

Despite the narrative built upon a revival of the 'beautiful clean coal'<sup>10</sup>, American coal has declined over the last 20 years, its cost-effectiveness being affected by the surge of shale gas and of renewables. By 2019, coal production had fallen back to its 1978 level. States halting production are no longer a rarity: Kansas in 2017, Arkansas in 2018, Arizona in 2019<sup>11</sup>. This decline in coal can be explained as much by the decline in its use in US thermal power plants as by the drop in exports. Short term trends remain uncertain, however.

Higher natural gas prices can provide opportunities for coal to start growing again. Thus, EIA forecasted in 2020 that coal's share of electricity generation would fall from 24 percent in 2019 to 20 percent in 2020 but increase again to 25 percent in 2021, pushing upwards the GHG emissions of the US economy<sup>12</sup>. However, renewables have already overtaken coal as the number of jobs is concerned. Restructuring remains an issue as coal workplaces are heavily concentrated in a few States (40 percent of production came from Wyoming in 2019, the other producing states being West Virginia, Pennsylvania, Illinois, Kentucky).

The World geography of coal has thus radically changed within a few years. China's role in the world market was negligible in the early 2000s. Twenty years later, about 20 percent world's imported coal was reaching its market. In the meantime, Europe's share fell to less than 10 percent. Contrary to the trends noticed in Asia, Europe imports and consumes less and less coal. No European country has escaped its (too) slow

<sup>8</sup> Thomas Nilsen, 'Europe's clean energy shift troubles construction of giant coal port in Murmansk', The Barents Observer, October 26, 2020.

<sup>9</sup> 31.7 percent and 27.4 percent respectively in 2019 (IEA, 2020b).

<sup>10</sup> 'The Myth of Donald Trump's Revival for 'Beautiful Clean Coal'', Environment & Energy Report, Bloomberg Law, 29.10.2018.

<sup>11</sup> U.S. Energy Information Administration, Annual Coal Report, November 2018.

<sup>12</sup> U.S. Energy Information Administration, Short-term energy outlook, November 10, 2020. <https://www.eia.gov/outlooks/steo/>

decline. Mines are closing and coal-fired power stations (responsible for around 18 percent of European GHG emissions<sup>13</sup>) see their competitiveness undermined by decreasing prices in the renewables and gas sectors. Hence the general process of coal phasing-out that is taking place in Europe, albeit at different paces.

### Pathways to a coal-free European Union

In 2020, coal mining was still an economic activity in nine out of the twenty-seven Member States (as well as in the UK) and coal-fired electricity was still part of the power mix in twenty out of twenty-seven countries. However, Europe is in sharp contrast with Asia as coal<sup>14</sup> is being phased-out at a pace considered too slow by many environmental NGOs but much faster than in many other developed economies. Clearly, the EU is on its way towards a coal free area and some policy instruments of the EU climate policy might prove instrumental in this respect.

#### *National pathways: the same trend at different paces*

The EU has gone through a steady decline in coal mining due first and foremost to the depletion of resources and thus to higher costs. 277 million tonnes were mined in 1990, 65 million tonnes in 2019. In 1990, thirteen Member States of the current EU were producing hard coal. In 2019, there were only two left: Poland and Czechia but

even for these 2 countries, perspectives are bleak. Compared with 2012, Poland decreased its production by 22 percent and Czechia by 70 percent<sup>15</sup>.

In Germany, the country's last hard coal mine closed in December 2018. In Spain, the European Commission approved in 2016 the Spanish government's plan of October 2013 to grant more than €2 billion for the orderly closure of twenty-six coal mines by 2018<sup>16</sup>. By the end of 2018, all Spanish coal producers had closed their mining operations<sup>17</sup>, the last mines being located in the Asturias. At his peak, the industry employed in the 1990s more than 50,000 miners.

However, brown coal mines are still in activity in several Member States, especially in Germany but downward trends prevail in this matter too. In 1990, fourteen Member States were producing brown coal. In 2018, six were still doing so: Germany (43 percent of the EU production), Poland, Czechia, Bulgaria and Greece and Romania.<sup>18</sup>

Imports remain significant as coal-fired electricity generation is still widespread across the EU (in twenty out of twenty-seven Member States) and contributed 14.6 percent to the EU's power mix in 2019<sup>19</sup> but coal fire generation too is declining.

A pioneer country in the coal-based Industrial Revolution, the United Kingdom was the first country in the world to commit to phase-out coal, shortly before the Paris Agreement in 2015. Since then, several countries have already stopped

<sup>13</sup> Beyond Coal. Europe Beyond Coal. (2017). at <https://beyond-coal.eu/data/>. Accessed on 12th October 2020.

<sup>14</sup> A significant part of hard coal (47 percent in 2019) and the majority of brown coal (83 percent in 2019) is used for power production. Hard coal (more specifically coking coal) is essential to produce coke oven coke for the steel and iron industry. Four major types of coal are usually considered : anthracite - the highest rank of coal (often referred to as hard coal), bituminous coal, subbituminous coal, lignite the lowest rank of coal (often referred to as brown coal) almost exclusively used as a fuel for steam-electric power generation. [https://www.usgs.gov/faqs/what-are-types-coal?qt-news\\_science\\_products=0#qt-news\\_science\\_products](https://www.usgs.gov/faqs/what-are-types-coal?qt-news_science_products=0#qt-news_science_products). Accessed on 12.10.2020.

<sup>15</sup> European Commission, Eurostat, Consumption and production of hard coal, [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Coal\\_production\\_and\\_consumption\\_statistics#Consumption\\_and\\_production\\_of\\_hard\\_coal](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Coal_production_and_consumption_statistics#Consumption_and_production_of_hard_coal). Accessed on 18th November 2020.

<sup>16</sup> The European Commission considered that this decision was in line with EU rules on state aid, in particular Council Decision 2010/787/EU (case SA.34332).

<sup>17</sup> <https://euracoal.eu/info/country-profiles/spain/>. Accessed on 10th November 2020.

<sup>18</sup> European Commission, Eurostat, Consumption and production of hard coal, [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Coal\\_production\\_and\\_consumption\\_statistics#Consumption\\_and\\_production\\_of\\_hard\\_coal](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Coal_production_and_consumption_statistics#Consumption_and_production_of_hard_coal). Accessed on 18th November 2020.

<sup>19</sup> Coal power plants made up 31 percent of EU ETS emissions in 2019.

using coal (Belgium in 2016, Austria in 2020, sometimes earlier than scheduled such as Sweden in 2020) and 11 have committed to phase out coal before 2030<sup>20</sup>. EU coal power generation fell 24 percent in 2019 and emissions already reflect the declining use of coal. For the year 2019, data from the Union's registry of the emissions trading scheme (ETS) show that emissions dropped by 24.5 percent in comparison with 2018. The strongest absolute decline happened in Germany, with 54 million tonnes of CO<sub>2</sub> less than the previous period. This confirms the downward trend noticed since 2012 when the EU's CO<sub>2</sub> emissions from coal power stations peaked. Since then, coal-based CO<sub>2</sub> emissions have dropped by 47 percent<sup>21</sup>.

Several reasons explain this progressive decline of coal in the European economy. Political decisions have played a role in the context of climate change mitigation narrative but phasing-out has not been government-driven everywhere. Depletion of resources as well as costs associated with tougher EU environmental regulations are instrumental. In Austria, the companies operating the two coal plants closed them in 2019 and 2020 without being forced to do so. In Belgium, the last coal plant closed in March 2016 ending a process of progressive closure of aging power plants in the context of tougher by EU regulations.

The COVID-19 pandemic has accelerated the process, coal-fired power output dropping 32 percent in the EU during the first semester of 2020, while highlighting a divide between Western and Eastern Europe. Whereas Western European countries were numerous to phase-out coal in the 80s and the 90s, communist regimes

were keen to keep it as a key instrument for economic development and political self-reliance. During the pandemic and in the context of decline of coal consumption in Germany, the Czech Republic became the third largest producer of coal-based electricity in Europe, Bulgaria the fourth. Poland could have been second behind Germany, but because of a sharp drop in production in Germany, it became the European country producing the most coal-based electricity.

Thus, in the European geography, coal-fired power generation is progressively becoming a Central European specificity. In 2020, four Central European countries (Czech Republic, Romania, Bulgaria, Croatia) had not decided yet upon a coal exit date<sup>22</sup> while for the first time Poland put forward a deadline (related exclusively to the mines closure) : 2049<sup>23</sup>.

Will coal-based generation plants be cost-competitive until then? The EU climate, competition and environmental policies have affected the profitability of the coal sector in different ways, hence speeding-up the phasing-out of this source of energy. It is certainly not in the remit of the European Commission to decide upon the energy mix of a Member State<sup>24</sup> but different EU policy instruments aiming at lowering GHG emissions are affecting cost-effectiveness of coal fired power-plants.

### *EU policy instruments are playing a key role in the phasing-out of coal*

Among the factors that explain the decline of coal across Europe, EU policy instruments have indeed been playing a key role. The Emission Trading

<sup>20</sup> Portugal by 2021, France by 2022, Slovakia by 2023, Italy and Ireland by 2025, Greece by 2028, The Netherlands and Finland by 2029, Hungary, Slovakia and Denmark by 2030. Europe beyond coal, Overview: National coal phase-out announcements in Europe

<sup>21</sup> Felix Reitz, European coal in structural decline, Europe Beyond Coal, 24. 06 2020. <https://beyond-coal.eu/2020/06/24/european-coal-in-structural-decline/>. Accessed on 18th November 2020.

<sup>22</sup> Bloomberg New Energy Finance, Investing in the Recovery and Transition of Europe's Coal Regions, White Paper, 06.07.2020.

<sup>23</sup> 'Poland agrees to shut coal mines by 2049', Euractiv, 26.09.2020, <https://www.euractiv.com/section/electricity/news/poland-agrees-to-shut-coal-mines-by-2049/>. Accessed on 12 November 2020.

<sup>24</sup> Article 194 of the Treaty on the Functioning of the European Union (TFEU) states that each EU country maintains its right to 'determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply'.

Scheme (ETS) has a limited impact on European emissions because of a large supply of allowances (especially of free allowances<sup>25</sup>) which has prevented carbon prices from reaching a threshold that would weigh on the competitiveness of coal-fired power plants. In addition to serious design flaws, the ETS suffered from the financial and economic crisis of 2018 which depressed the demand. However, the introduction of a Market Stability Reserve (MSR) in 2019 led to a sharp rise of carbon price. The steady increase in industrial output in the EU since January 2017 led to a rise in demand for quotas and contributed to the perception of a tightening market. Prices surged also strongly against the background of the speculation from market players who were anticipating further increases in CO<sub>2</sub> prices and have been taking long positions on the ETS market.

Not all design flaws have been tackled though. The market has been experiencing strong volatility as no carbon price floor provides a protection against sudden price drops<sup>26</sup>. Thus, a lack of visibility due to energy market fundamentals shifting (for example a decrease in the cost of renewable energy and storage technology) could depress demand for quotas and depreciate their price. However, while financial data at the scale of thermal power stations is not readily available, the financial impact of the ETS should not be overlooked in the context of low gas prices. In Poland, the main public company<sup>27</sup> declared having spent more than €160 million additional during the first

quarter of 2020 despite a reduction in its emissions of 5 percent and due to the increase in the price per tonne of carbon<sup>28</sup>. In Germany, Vattenfall referred in 2020 to the European carbon market to close its Moorburg plant (near Hamburg), a plant inaugurated only five years earlier<sup>29</sup>.

On the top of the ETS, EU environmental regulations have also taken their toll. In July 2017, the European Commission adopted 'Best Available Technique'<sup>30</sup> decision which amended a 2010 Directive related to the standards to be observed in terms of pollution by a series of industrial installations including coal-fired power stations<sup>31</sup>. These new standards, to be applied before the end of 2021, have induced costly adaptation work for around 80 percent of European thermal power plants. As a consequence, several European energy companies have brought forward the end date for the closure of their coal-fired power stations.

Polish authorities have tried to water down EU climate initiatives. They launched the 'yellow card' procedure against the legislative initiative 'Clean Energy for All Europeans', arguing that the principle of subsidiarity had been ignored by the EU<sup>32</sup>. In 2019, the European Council endorsed the project of a climate neutral Union by 2050 but Poland refused to join this initiative before seemingly sharing this strategic vision for itself<sup>33</sup>. The EU commitment to achieve carbon neutrality might indeed accelerate the phasing-out of coal across Europe since it implies an upward revision

<sup>25</sup> Free allowances have been discussed by the ECA (European Court of Auditors, 2020).

<sup>26</sup> Article 29a of the EU ETS Directive provides for the possibility of convening a meeting at EU level in the case of excessive price fluctuations.

<sup>27</sup> Polska Grupa Energetyczna.

<sup>28</sup> Maria Wilczek, 'After government forbids Russian imports, Polish state firms switch to pricier domestic coal', Notes from Poland, 4th June 2020.

<sup>29</sup> Michael Bauchmüller, 'Vattenfall will umstrittenes Kohlekraftwerk Moorburg stilllegen', Süddeutsche Zeitung, 4th Sep. 2020.

<sup>30</sup> European Commission. Commission implementing Decision (EU) 2017/1442 of 31 July 2017 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants. (2017). at <<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D1442&from=EN>>

<sup>31</sup> European Parliament and the Council of the European Union. Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast). (2010).

<sup>32</sup> Under the yellow card procedure, national parliaments can object to a draft legislative act on grounds of the principle of subsidiarity. If one-third of the national parliaments raise an objection the European Commission must review the proposal. This procedure was introduced in the Lisbon Treaty (2009).

<sup>33</sup> Frédéric Simon, Warsaw says 'committed' to EU's climate neutrality goal, Euractiv, 15th September 2020.



of European objectives regarding emissions to be cut by 2030. In September 2020<sup>34</sup>, the European Commission confirmed that the adoption of a 55 percent threshold (reduction in emissions) for 2030 (instead of 40 percent as previously agreed) would imply that by 2030 'the consumption of coal [would] have to be reduced by more than 70 percent compared to 2015 and that of oil and gas of more than 30 percent and 25 percent respectively'<sup>35</sup>. Thus, the green deal might have far-reaching consequences for Europeans coal power plants. The new EU target would imply a near total phase-out of coal power plants, a scenario that would also require from Germany that it brings forward its coal phasing-out currently scheduled for 2038 at the latest or that production capacities remain connected only to ensure grid stability and security of supply.

Whatever scenario prevails, coal phasing-out will raise economic and social challenges that might spur local crisis as coal mining related activities are concentrated in a few European regions which economic fabric, tax revenues and social cohesion might be affected.

## Conclusion

The geography of coal has gone through a reshaping process in which India and China have overtaken the EU, Japan, South Korea as the main markets. In Europe, coal phasing-out is underway and this decline is linked both to policy initiatives and to the deteriorating economics of coal. How coal has shaped regional and social identities should not be overlooked as phasing-out means the end of a long story (coal mining started in many European countries during the 19th century and sometimes much earlier, as in Spain where it first began in the 16th century). Hence the need to highlight social and political challenges linked to the energy transition and that might look at

first hand of little importance in the light of the low number of jobs that remain reliant on coal related activities across Europe.

Besides the challenges faced by regions affected by the phasing-out of coal, one important question regarding climate change remains: will gas replace coal? In 2019, the absolute growth of gas was higher than the growth of renewables. Roughly 40 percent of coal power was replaced by renewables, 60 percent by gas. Most of the increase of gas generation was due to higher competitiveness of existing plants, rather than capacity additions<sup>36</sup> but new fossil gas power plants might be an option in some Member States. Hence the necessity for European policies not only to gear the transition so that coal is phased-out, social consequences are tackled but also in a way that alternative energy infrastructures won't be considered tomorrow as stranded assets... just like some coal plants today.

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<sup>34</sup> Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions, Stepping up Europe's 2030 climate ambition, Investing in a climate-neutral future for the benefit of our people, {SEC(2020) 301 final} - {SWD(2020) 176 final} - {SWD(2020) 177 final} - {SWD(2020) 178 final}, Brussels, 17th September 2020.

<sup>35</sup> Sören Amelang, Kerstine Appunn, Julian Wettengel, 'EU climate target of -55percent would mean near-exit from coal in 2030', *Clean Energy Wire*, 5th October 2020.

<sup>36</sup> Felix Reitz, op.cit.