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POLICY PAPER

To dig or not to dig: three reasons why coal is the fuel of the past

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- **The world of energy is transforming at a fast pace and it is becoming increasingly clear that out of all the currently available sources of energy, coal will be at the receiving end of this global shift.**
- **There are three main reasons for this trend: falling global demand, decreasing global investment into new projects, and an increasing pressure to make the coal industry comply with climate and pollution regulations.**

Introduction

The hard coal industry has (up until recently) been battling low commodity prices rendering the mining operations in many countries unprofitable. As for brown coal (lignite), which is the primary type of coal used for energy generation, its production has been steadily declining since 2011 [1] as the demand for this fossil fuel has been continuously dropping. Coupled with the increasing pressure that the highly-emitting and highly-polluting coal-fired power plants are facing from air pollution and climate regulations, generating electricity from coal is becoming increasingly unprofitable as well as undesirable, not only in Europe, but across the whole world.

This has been also reflected by the global investments into the coal power sector, which according to the International Energy Agency have already reached their all-time peak and are now set to "dramatically" decline in the coming years.[2] The fact that a record high number of coal plants retired in 2016 and a record low amount of new coal capacity was added at the same time has led to claims of global "free-fall" of coal.[3] The trend has been particularly visible in major developing countries with high levels of energy consumption such as China and India.[4]

This is a favourable development from the point of view of climate protection as coal is the single most emitting source of energy. However, the trend would need to continue at a much faster pace if it was to have the desired effects on the overall greenhouse gas emissions and temperature reductions necessary to mitigate global warming. Indeed, one recent research shows that if the EU wants to meet the goals of the Paris Agreement, it needs to phase-out *all* of its coal power plants by 2030.[5]

While the transition away from coal is indisputably happening, there are still several factors preventing a more rapid progress. The dependency on the coal industry is an obvious obstacle to more ambitious government policies that would accelerate the ongoing energy transition. Measures that help maintain the status quo (and that the coal industry advocates to keep in place) are for example capacity mechanisms (effectively functioning as state subsidies) or exemptions for coal-fired plants from the pollution limits. Without these provisions, generating electricity from coal would be even less profitable than it currently is and its decline would be even steeper.

Moreover, political resistance has also appeared in the recent years, with some politicians trying to turn the tide instead of accepting the direction of the global progress and preparing their countries for the inevitable changes. This has been the case for example of Donald Trump, who has vocally pledged to resuscitate the ailing US coal industry and preserve the jobs for its workers. However, neither Donald Trump, nor any other country leader can change the direction of global energy trends.

While it is necessary to think of the regions and people directly impacted by the phase-out of coal mining and burning and prepare them for the new realities, it is futile or even counter-productive to try and preserve what is sooner or later bound to end. The better approach would be to acknowledge that the heyday of coal has already passed and a transition is necessary. This, however, does not need to mean an economic slowdown or a widespread loss of jobs. With anticipation and proper preparation,

[1] Statista, „Production of lignite worldwide from 1990 to 2016 (in million metric tons)", https://www.statista.com/statistics/267894/global-lignite-production-since-1990/.

[2] Evans, Simon, „Seven charts show why the IEA thinks coal investment has already peaked", *Carbon Brief*, 11 July 2017, https://www.carbonbrief.org/seven-charts-show-why-the-iea-thinks-coal-investment-has-already-peaked.

[3] Vaughn, Adam, „Coal in 'freefall' as new power plants dive by two-thirds", *The Guardian*, 22 March 2017, https://www.theguardian.com/environment/2017/mar/22/coal-power-plants-green-energy-china-india.

[4] In 2017, the global coal consumption rose by 0.7% after the previous years of decline. This was mostly due to the global economy growing at a fast pace as well as the rapid global population growth, creating higher demand for all energy sources, including coal.

[5] Climate Analytics, „EU needs to shut all coal plants by 2030, or will vastly overshoot Paris Agreement – report", 9 February 2017, http://climateanalytics.org/latest/eu-needs-to-shut-all-coal-plants-by-2030-or-will-vastly-overshoot-paris-agreement---report.

moving away from coal and towards a more low-carbon economy can bring about more advantages than disadvantages for all the regions and communities involved.

Unlike the US president, the European Commission acknowledges this development and has introduced a new platform intended to help the "Coal Regions in Transition"[6] manage these changes, adjust to the new life beyond coal and in general smoothen the process of transition as much as possible. Extra funding has been allocated to this initiative on top of the usual cohesion funds the EU uses for the developments of its poorer regions. It is important, however, to ensure that this initiative truly serves to prepare Europe for the post-coal era and does not play in the hands of the coal industry by supporting the so-called "clean" coal technologies, which has not been proven to work.

Three reasons why coal is the fuel of the past

From a long-term perspective, it is clear that coal is the fuel of the past, not the future. Despite the occasional increases in its consumption, the overall trends are showing that its role is diminishing. Indeed, the managing director for energy at the World Bank has recently said in an interview that within the next thirty years, coal will "go out of the energy mix."[7] Below are three graphic charts illustrating the three key reasons why many believe coal's days are numbered.

1. Global demand for coal will fall

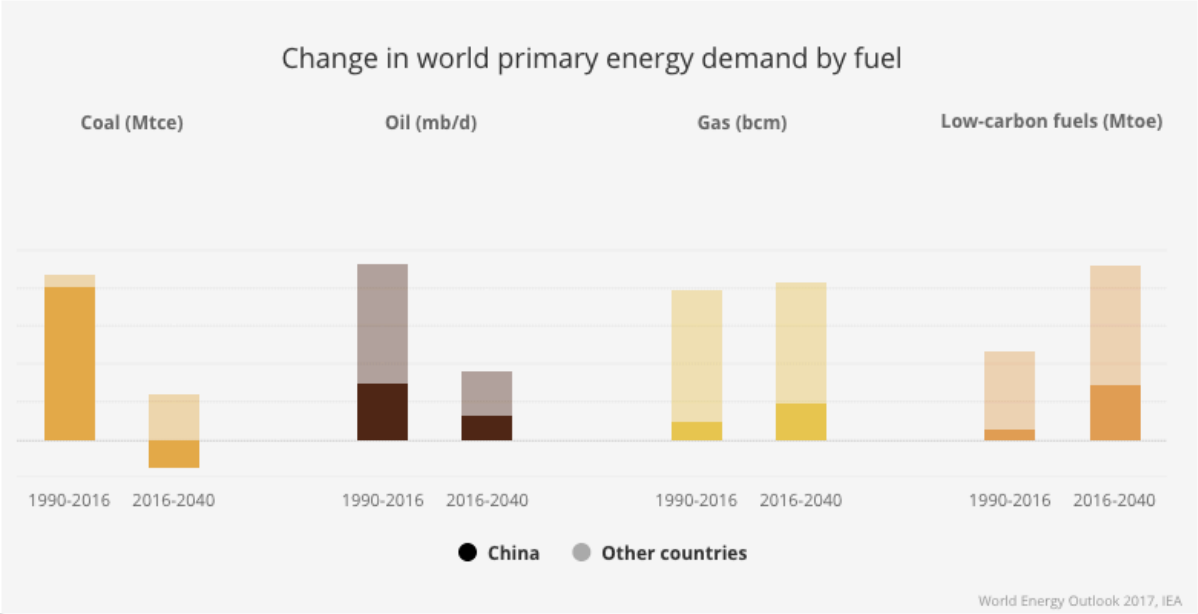
While some older models have predicted that coal demand would keep rising or at least plateauing, this belief has now been largely disproved as even the latest World Energy Outlook 2017 acknowledges that demand for coal will in fact fall and predicts it will happen at a rather sharp pace. Of course, predictions about the future of energy demand always have to be taken with caution, as there are a high number of variables that can change over time for reasons that cannot be predicted. However, if we look at the reality, we can already see some pointers indicating that this prediction can be justified.

In the EU, for instance, the coal power output fell by 25% over the last five years and in 2017 electricity made of renewables for the first time overtook that made of coal.[8] The main drivers of this change will, however, be China as well as the United States. The development in China is especially important, as it currently accounts for more than half of the total global demand – any changes there will thus necessarily impact the global markets. As the graph below shows, China's demand for coal power is set to not only fall, but to actually go into negative numbers between the years 2016 and 2040. In the United States, the shale gas revolution has created a pressure on coal, as coal-fired power plants are now increasingly expensive to operate compared to the gas-fired ones. It is thus expected that the demand will fall here as well.

[6] European Commission, „Conference: Coal Regions in Transition Platform", 11 December 2017, https://ec.europa.eu/energy/en/events/conference-coal-regions-transition-platform.

[7] Sharma, Bhawna, „Coal use will drastically decline in the next 30 years, the World Bank predicts", *CNBC*, 1 April 2018, https://www.cnbc.com/2018/04/01/coal-use-will-drastically-decline-in-the-next-30-years-the-world-bank-predicts.html.

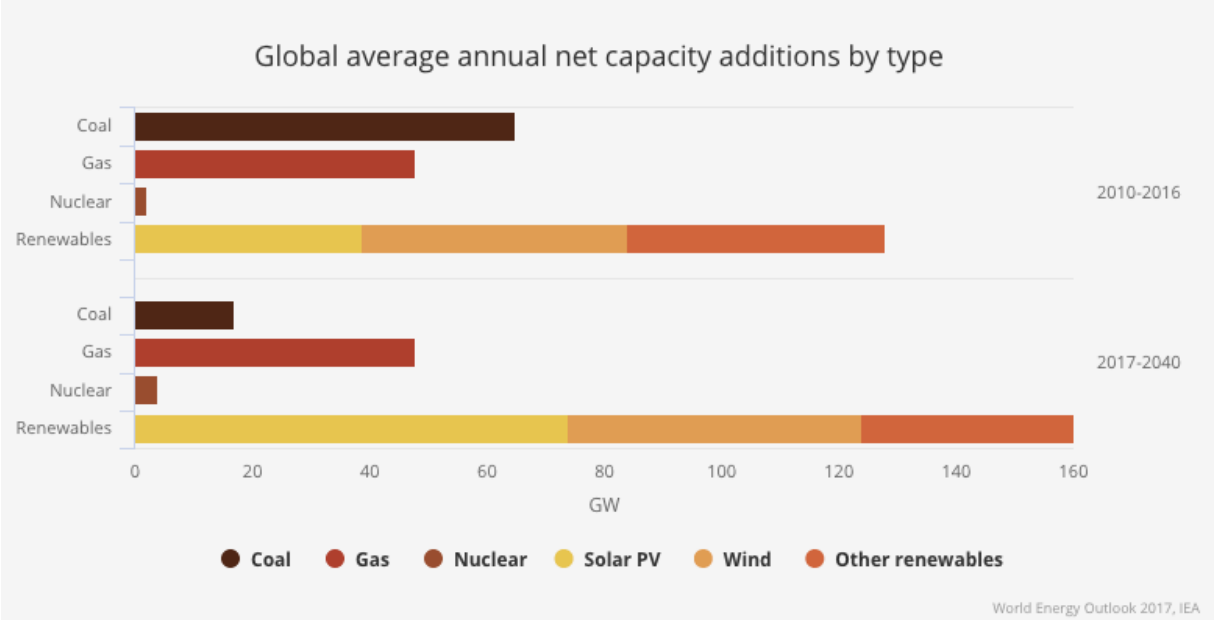
[8] Carbon Brief, „The EU got less electricity from coal than renewables in 2017", 30 January 2018, https://www.carbonbrief.org/eu-got-less-electricity-from-coal-than-renewables-2017.



Source: World Energy Outlook, IEA, 2017, https://www.iea.org/weo2017/#section-1-2

2. Global investment into coal will decrease

The total global investment into new coal projects is already decreasing and it will continue to decrease even further in the future, while the investment into renewables will keep rising. As the graph below shows, the expected additions of annual net capacity will drop by roughly 74% between 2017 and 2040 for coal, while the added capacity of renewables will increase by 25% in the same period.



Source: World Energy Outlook, IEA, 2017, https://www.iea.org/weo2017/#section-1-2

In the US, for instance, coal accounts for about 25% of the country's generation capacity, but this all comes from the existing plants, lots of which are becoming out-dated, and there are no new investments planned for increasing the capacity in the upcoming future.[9]

The trend is, however, once again especially driven by the developments in China, which has been moving towards low-carbon, low-pollution energy sources in an attempt to curb its alarmingly poor domestic air quality. While China still covers around 60% of its energy needs with coal, its installed coal capacity is predicted to flat-line around its current capacity levels for the next three decades. According to the International Energy Agency, China's coal use peaked already in 2013 and will henceforth decline by roughly 15% before the year 2040.[10]

As outlined above, the changes in global investment patterns are already visible nowadays. In 2017, the world installed more solar capacity than coal, gas and nuclear combined[11] and as the costs of renewables continue to drop, it can be expected that their share of the global power market will keep rising at the expense of coal, which is on the other hand becoming very costly.

With many coal plants having to retire (or undergo an expensive renovation) in the upcoming years due to their obsolete technologies, and with few new plants planned to be built, the global coal fleet will certainly be diminishing. With low market prices of coal and high operating costs, coal-fired power plants are losing their attractiveness to investors faster than any other energy source.

3. Increasingly tougher regulations will make coal business unprofitable

Complementing the previous two reasons is a third one, not least important – burning coal has negative effects on the human health, the environment, the air and the climate – and consequently on public finances. The economic burden of all European coal-fired power plants, for example, is estimated at € 54 157 million.[12] Thus, an increasing number of measures is being put into place by governments in an attempt to internalize these external costs of coal combustion. These regulations set limits on air pollutants (sulphur dioxide, nitrogen oxides, mercury and small particles) as well as on the emissions of carbon dioxide. Ideally, it should force the dirtiest and most emitting plants to retire, as their operating costs under these regulations would be too high. In reality, however, many countries employ exemptions from these regulations, keeping even the least efficient plants alive.

Nevertheless, as the impacts of air pollution and climate change get worse, it can be expected that these regulations will become more stringent purely because the public costs of not addressing the problems will become higher than the costs connected with the coal phase-outs.

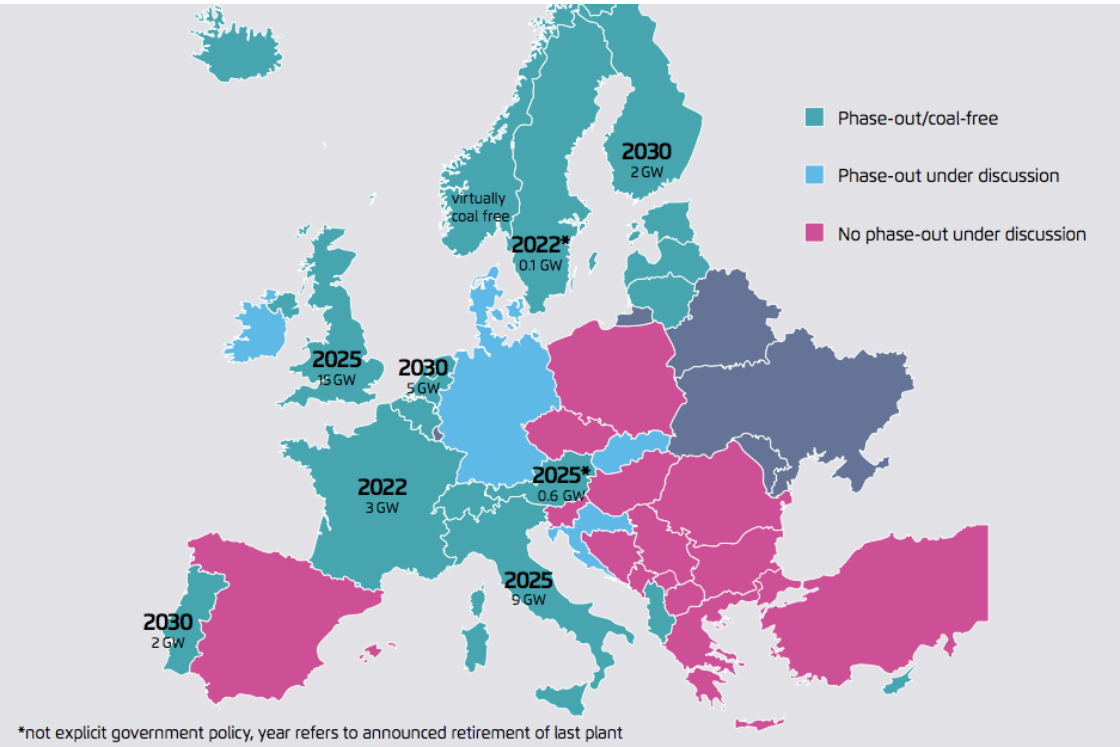
We are already witnessing numerous countries around the world announcing their plans for coal phase-out. In the EU, these countries include for example the UK, France, Italy, Portugal, Denmark, the Netherlands and most recently Finland. As the map below shows, all of them have pledged to go coal-free by 2030 or sooner.

[9] Crooks, Ed, „The future of coal in seven charts", *Financial Times*, 19 September 2017, https://www.ft.com/content/82f9087c-9cdd-11e7-8cd4-932067fbf946.

[10] International Energy Agency, „World Energy Outlook 2017", 14 November 2017, https://www.iea.org/weo2017/#section-1-5.

[11] Scott, Mike, „Solar Power Investment Outstripped Coal, Gas And Nuclear Combined In 2017", *Forbes*, 9 April 2018, https://www.forbes.com/sites/mikescott/2018/04/09/solar-power-investment-outstripped-coal-gas-and-nuclear-combined-in-2017/#227008931237.

[12] Beyond Coal, „Data", 2017, https://beyond-coal.eu/data/.



Source: Carbon Brief, 2018, https://www.carbonbrief.org/eu-got-less-electricity-from-coal-than-renewables-2017

However, there is a cluster of states in Central and Eastern Europe, which are resisting this move beyond coal. Indeed, the three countries with the highest emissions from lignite are Germany, Poland and the Czech Republic.[13] Moreover, Poland is the EU's worst air polluter. Poland is also one of the countries where coal is exempted from several regulatory schemes, which allows its polluting plants to continue operating. However, there is an increased public backlash against this special treatment of large polluters and we have already seen some of the efforts at ending it come to fruition. It is necessary that these efforts continue so that coal does not have an unfair advantage as opposed to other, cleaner sources of energy.

Conclusion and recommendations

As illustrated above, there is substantial evidence suggesting that coal's role in the global energy mix will be diminishing over the coming decades. There are three main reasons for this trend:

- Falling global demand for coal.
- Decreasing global investment into new coal projects.
- Increasing pressure to make the coal industry comply with air pollution and climate regulations.

[13] Sandbag, „NEW DATA: EU ETS emissions rise for first time in 7 years", 3 April 2018, https://sandbag.org.uk/project/eu-emissions-rise-for-first-time-in-7-years/.

A transition away from coal is under way; the question is how fast it will be and how well it will be managed. What should be done to ensure that this transition is as efficient and smooth as possible? Below are three suggested recommendations:

- Governments should listen to the public and as well as the majority of investors, who are not favouring coal any more. "Hidden" subsidies such as capacity payments should not be used.
- Governments should invest into alternative sources of energy, especially the low-carbon ones, and not into supposedly "clean" coal technologies. This will also send a clear signal to the market about where the future lies.
- Coal plants should not be exempted from any emission reduction schemes or pollution regulation schemes. The money collected by these measures should be used to support a move towards more sustainable, low-carbon energy systems.

Prague Climate Talks is a new project aimed at establishing a platform for continued high-level discussion on the complex issue of climate change. Throughout a series of debates it will bring together experts and professionals from varying relevant fields as well as members of the general public.

The project is co-organised by **EUROPEUM Institute for European Policy** and **Glopolis** in cooperation with **Heinrich-Böll-Stiftung Prague** and under the auspices of the **UN Information Centre Prague**.

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