

Global and regional coal phase out requirements of the Paris Agreement: Insights from the IPCC Special Report on 1.5°C

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Key messages

This study unpacks for the first time the implications for coal power of 1.5°C Paris Agreement compatible energy transformation pathways assessed in the IPCC Special Report on Global Warming of 1.5°Cⁱ. To evaluate the practical implications for a coal phase out under the Paris Agreement we focus on unabated coal because we consider that the future deployment of carbon capture and storage (CCS) for fossil fuel power plants is very unlikely due to high cost and the absence of CCS in the current coal pipeline.

Based on regional pathways for the 5 regions considered by the IPCC SR1.5, the main findings are:

- Regardless of the region, coal use for power generation needs to peak by 2020, and be reduced quickly afterwards
- Unabated coal-fired power generation globally should be reduced to 80% below 2010 levels by 2030 and phased out before 2040, some 10 years earlier than previous estimates.
- Most reductions in coal in the power sector need to happen by 2030, when the share of coal in electricity generation should not exceed 13% anywhere, and be around 6% globally.
- Between 2030 and 2040 all the regions should phase-out of coal. The first regions to phase out are the OECD, Eastern Europe and Former Soviet Union countries by 2031; followed by Latin America by 2032, Middle East and Africa by 2034, and finally non-OECD Asia by 2037, completing a global coal phase-out before 2040.

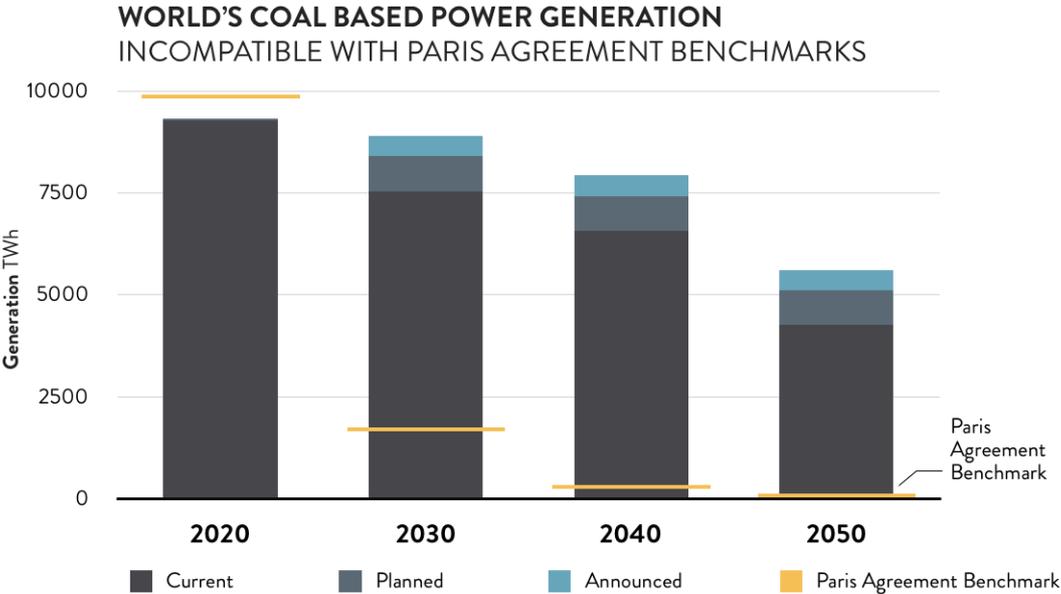
Table 1 – Phaseout dates of median Paris Agreement compatible regional pathways

Region	Phaseout Date
OECD	2031
Non OECD Asia	2037
Latin America	2032
Middle East and Africa	2034
Eastern Europe and Former Soviet Union	2031

These results confirm the key findings of our 2016 report in regards to the need for peaking by 2020, the rapid reduction needed afterwards, and the fact that some regions like the OECD need to phase-out earlier than the rest of the world. In 2016 only one Paris Agreement compatible pathway was available. With the availability of a significant number of new pathways it is clear that the global coal phase-out should be much earlier than the 2050 year estimated in 2016. Based on examination of all available regional pathways we now estimate that phase-out should be completed at the global level by a median date of 2037.

At present the world is not tracking towards a Paris Agreement compatible phase out of coal. Current and planned coal power plants globally which would lead to a generation increase of 3% by 2030 compared to 2010 levels. If the world follows these present trends, this would lead to cumulative emissions from coal power generation more than three times larger than what would be compatible with the Paris Agreement by 2050.

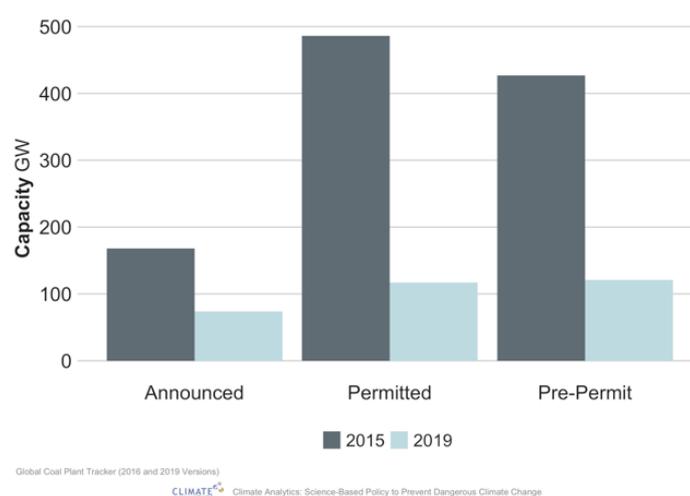
Figure 2 – Future coal generation from current and planned coal power plants against Paris Agreement benchmarks



To keep the door open for the Paris Agreement’s 1.5°C limit, countries will need to plan to retire a large number of existing coal power plants early, reduce the utilisation rate of those that remain, and refrain from building new coal capacity.

There are some signs of action in the sector, providing cause for optimism on the possibility of an accelerated transition away from coal. The number of new coal power plants in the planning pipeline shrank by nearly 75% globally between 2015 and 2019, and several countries and investors have committed to either restrictions or a complete ban on new coal power generation. The utilisation rate of the operating coal fleet continues to decline in several countries, affecting coal utilities’ profitability and their willingness to invest in coal asset expansion and refurbishment. As a result, coal assets are becoming increasingly vulnerable to market and policy changes around the world.

Figure 3 - Change in Coal Pipeline between 2015 and 2019



However, progress is far too slow compared to what is required under the Paris Agreement. In addition to the actions being taken by investors and national entities to restrict new coal capacity, a fundamental reconfiguring of the global power sector is needed, led by a shift away from coal (and other fossil fuels). This transformation will benefit from the rapidly falling cost of renewable energy and storage technologies, making a fast transition to renewable energy increasingly feasible.

A critical opportunity to scale-up national and international ambition on climate action is the current revision cycle for Nationally Determined Contributions (NDCs), as laid out in the Paris Agreement. Under the current NDC revision cycle, all countries are expected to submit new, more ambitious, climate pledges by 2020. Strengthening governments' commitment to climate policy via the NDCs by including a clear commitment to phase out coal, remove subsidies for fossil fuels, and build support for renewables and energy efficiency, offers new opportunities for industrialised and developing countries alike to build a resilient low-carbon economy in line with the commitments made in Paris. Doing so would provide many benefits in addition to avoiding climate impacts, including avoided air pollution, increased access to clean and modern energy, employment opportunities, and increased energy independence and security.

At the same time, by enhancing their commitment to the Paris Agreement and planning for an early coal phase-out, governments can reduce the risk of creating stranded assets with their associated costs, and send a signal to large institutional investors to increase their involvement in the low-carbon economy. Doing so would also encourage non-state actors to avoid further investments in coal and reduce their exposure to this risky sector.

ⁱ Paris Agreement compatible pathways consistent with 1.5° C global warming were defined in the IPCC 1.5°C Special Report as model pathways with no or limited overshoot of 1.5° C. In addition, this study applies the IPCC defined sustainability constraints on the pathways analysed which were operationalised in the form of limits for bioenergy combined with carbon capture and storage (BECCS), as well as carbon uptake in the land sector. Applying these criteria this study has analysed with 18 scenarios that are consistent with the Paris Agreement.