COAL TRANSITIONS
www.coaltransitions.org

Author
Oliver Sartor

STRENGTHENING NATIONAL COAL TRANSITIONS TO RAISE CLIMATE AMBITION

Issue Brief

Part of the 'Coal Transitions: Research and Dialogue on the Future of Coal' Project

November 2017

Climate Strategies

IDDRI

STRENGTHENING NATIONAL COAL TRANSITIONS TO RAISE CLIMATE AMBITION

Part of the 'Coal Transitions: Research and Dialogue on the Future of Coal' Project

PARTICIPATING INSTITUTIONS: ● **INDIA** Indian Institute of Management Ahmedabad; Indian Institute of Information Technology Allahabad ● **CHINA** Institute of Energy, Environment and Economy, Tsinghua University ● **SOUTH AFRICA** Energy Research Centre, University of Cape Town ● **AUSTRALIA** Crawford School of Public Policy, Australian National University; Melbourne Sustainable Society Institute, University of Melbourne ● **POLAND** Institute for Structural Research (IBS) ● **GERMANY** German Institute for Economic Research (DIW Berlin).

Author

Oliver Sartor, *IDDRI*

Cite this report as

Sartor, O. (2017). Strengthening National Coal Transitions to Raise Climate Ambition, IDDRI and Climate Strategies.

Acknowledgements

The project team is grateful to the KR Foundation for its financial support. Additional financial support was provided by the European Climate Foundation.

The author is grateful to Thomas Spencer, Henri Waisman, Michel Colombier, Franziska Holz, Tim Scherwath, for their comments on previous versions of this document.

Contact information

Oliver Sartor, IDDRI, oliver.sartor@iddri.org
Andrzej Błachowicz, Climate Strategies, andrzej.blachowicz@climatestrategies.org

www.coaltransitions.org

Publishers: IDDRI and Climate Strategies
Editors: Pierre Barthélemy
Graphic design: Ivan Pharabod

STRENGTHENING NATIONAL COAL TRANSITIONS TO RAISE CLIMATE AMBITION

November 2017

Coal transitions: an issue whose time has come

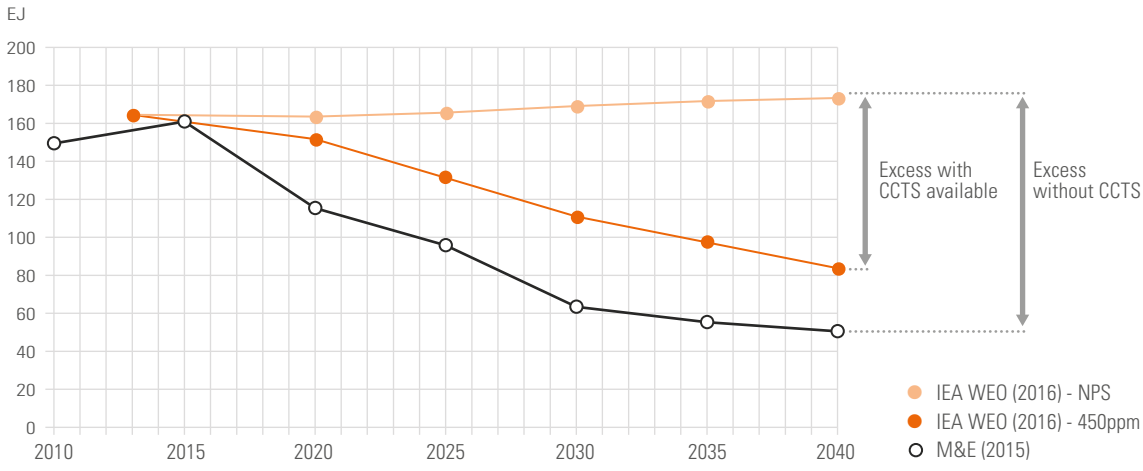
The issue of coal transitions is coming into focus in both national and international climate policy discussions. There are several drivers of this. At one level, the Paris Agreement marked a significant shift in the pace, scope and ambition of global climate change mitigation action. Consequently, it is now clear that coal will need to play a more and more diminished role in the global energy mix in the coming decades, despite carbon capture and storage (CCS) technologies (**Figure 1**).

It is also increasingly clear that non-climate policy-related factors, such as rapid declines in the cost of renewable energy and battery storage, will continue to challenge the previously strong role of steam coal in the global energy mix (Randall, 2015). The business-as-usual scenario suggested in **Figure 1** is therefore evolving quickly and the downside risks to coal demand appear to be increasing.

The accumulation of these factors has in turn led to a call for an assurance of "just transition", especially from stakeholders—notably coal sector workers and their communities—whose economic livelihoods depend on the future of an industry that will be in decline.

In this context, parties to the UNFCCC will be called upon *via* the Facilitative Dialogue of 2018 to re-evaluate the adequacy progress and subsequently to revise their levels of ambition in their nationally determined contributions (NDCs). This moment presents an important opportunity for governments to raise the overall ambition of their policies on coal transition. But how should they do this?

Figure 1. Recent global steam coal demand projections under alternative scenarios



Source: Illustration by DIW Berlin, based on data from IEA (2016), and McGlade and Ekins (2015).

The ambition gap around coal transitions

The use of steam coal as a fuel is currently responsible for ~28% of global primary energy consumption and 44% of annual CO_2 emissions (Center for Climate and Energy Solutions, n.d.). Currently, the world is estimated to have 6,683 coal-fired power stations in operation, with a combined capacity of almost 2,000 GW of power (UNEP, 2017). A significant reduction in the share of steam coal in the global energy mix is needed between now and 2050 if the world is to remain on track to achieve the <2°C goal (See **Figure 1**). Moreover, this is likely to be true *even if* CCS plays an important role in the low-carbon transition, due to limits with the capture rates and expected delays in bringing the technology to market under a mass-deployment scenario (McGlade and Ekins, 2015; IEA, 2016; Allen *et al.*, 2014).

Nevertheless, for the time being, global emissions from coal have only stagnated but not yet begun to fall in recent years. The future of coal is increasingly uncertain. However, based on current policy settings, plausible global demand scenarios still suggest that the world remains off-track for achieving anything close to a <2°C-compatible scenario for coal use. For example, a recent assessment shows that, if all existing coal power plants were run without CCS until the end of an assumed 40-year life-time, and all plants currently under construction or planned were to be built and run for 40 years, then they could lead to the world exceeding its carbon budget required for any chance of remaining below the Paris Agreement's 1.5°C target and put the 2°C target in serious doubt as well (UNEP, 2017). There is thus an urgent need to reverse this trend.

In addition to its negative impacts on climate, coal consumption also comes with a range of other negative impacts on human health and well-being, most notably respiratory and heart diseases linked to air quality problems from fine particulates and also stress on water availability in dry environments.

One important way that governments could raise climate ambition is therefore to take stronger measures to reduce the role of coal in their energy systems and related emissions. This is important not only to reduce emissions from coal, but also to provide visibility and added urgency to the parallel development of alternative energy sources.

However, for governments to do this, they also need to confront a number of other more fundamental issues—social, economic, financial, political—that, if left unaddressed, can pose different kinds of challenges for achieving a successful and sustainable phase-down of the share of coal. Tackling these challenges is therefore not as simple as just "putting a price on carbon" and watching the share of coal in the energy mix decline. It is rather a question of implementing a managed social and economic transition, and notably one that is fair for strongly affected stakeholders.

In order to make progress, governments therefore need to be thinking in broader terms of an integrated strategy for a managed coal transition, which should address two issues:

- Aligning economic and regulatory incentives for unabated coal phase-down as part of decarbonising the energy system per se;
- Anticipating and implementing policies to tackle crucial non-energy dimensions related to coal phase-down, most obviously the impacts on workers and local communities.

Only by addressing policy gaps in relation to both of these elements in parallel will governments be able to implement a just and sustained transition away from unabated coal.

Which policy gaps should we be focusing on to strengthen coal transitions?

In order to facilitate a global discussion on how to raise ambition and improve around coal transitions, IDDRI and Climate Strategies launched a project entitled *Coal Transitions: research and dialogue on the future of coal*. This section highlights the specific policy gaps that the project has identified and presents the main pieces of work that the project is undertaking on each issue.

Avoiding adverse impacts on workers

Although coal mining typically represents a small and declining share of the total workforce in most countries, specific groups of workers risk being strongly affected by a decline in world coal demand. Coal workers understand the risks to their livelihoods that are posed by climate policy and are often sympathetic to the moral need for a transition. However, what they are missing is a credible story that explains how they will find decent, equivalently well-paid, alternative work (and not just retraining). They are also looking for credible guarantees that other key parties to the transition will protect their interests and the resources to back up political promises. Workers will therefore be understandably reluctant to accept any transition away from coal that does not include these elements.

Related research outputs under the Coal Transitions Project: The Coal Transitions Project has begun to offer insights into these questions by commissioning 6 in-depth case studies of past coal phase-down experiences (see bibliography). Looking forward, the Coal Transitions Project is working with expert economists in national research institutions located in China, India, South Africa, Australia, Germany and Poland. These teams will each prepare an individual country report that will detail the role of coal in the energy system under alternative 2°C scenarios, and provide analysis and options for overcoming specific national obstacles, including a strong focus on labour market transition challenges in particular. These will be published in March 2018 together with a synthesis report in May 2018.

Building local economic resilience and an alternative industrial future

Historical experience with past declines in coal producing regions shows that it is not only the workers who can be hit hard, but also their children. In fact, one of the most significant risks, if poorly managed, can be a sizeable drop-off in demand in the local economy as mining and related activities are reduced. In cases where no economic resilience strategy is put in place, or is badly managed, the negative economic consequences for regions can last for generations, leading to intergenerational disadvantage for certain regions.

Economic resilience of a region to the decline of a significant former source of employment can not be created overnight. Governments and local stakeholders therefore need to anticipate these changes and plan to manage these risks activity. Depending on the nature of the local economy in question, these approaches could be very different. Positive examples from history suggest that increasing local economic resilience through intelligent industrial diversification strategies is often possible. However, it is not inevitable. An emerging message from the project is that forging a positive industrial transition strategy in advance and one led by local stakeholders with local knowledge and ownership is crucial for success.

Related research outputs under the Coal Transitions Project: To provide more detailed insights on this question, the Coal Transitions Project has commissioned work by leading international specialists in the field of economic geography and regional industrial innovation policy. A working paper, to be published in November

2017, addresses this issue, by presenting insights from the growing theoretical and empirical literature on old industrial transitions in Europe. Using the regional innovation systems theoretical framework, this paper aims to draw specific insights for coal transitions and to demonstrate how and under what conditions regions can show economic resilience despite the decline of a major local industry,

Avoiding the creation of stranded assets

In many countries, an important barrier to reducing emissions from burning coal sector is the risk of creating so-called "stranded assets". While the total macro-economic risks of such asset stranding are usually minimal, they can be a source of significant political opposition from specific interest groups. This has been the case recently, for instance, in countries with fast-growing penetration of intermittent renewable energy in the power sector. Countries therefore need to step up efforts to prevent new investment in coal assets that are likely to be stranded, especially where these involve state subsidies or guarantees (whether implicit or explicit). Specifically in the power sector, countries can also do more to ensure phase-in of decarbonised energy sources is accompanied by a managed phase-out of high carbon assets so as to minimise stranded asset risks.

Related research outputs under the Coal Transitions Project: The issue of stranded assets is a cross-cutting theme of the national coal transitions reports that will be developed by the 6 country teams in the project. In addition, power market experts from IDDRI and Tsinghua University will publish a paper that attempts to quantify the risks of stranded assets in China's coal-power sector under alternative climate and energy policy scenarios. The paper highlights the urgent need to avoid further investment into new coal-fired capacity that runs a high risk of being stranded. It also highlights the importance of a managed transition scenario that ensures timely phase-out of older plant in order to enable remaining coal plants to earn a reasonable return on investment before closing down themselves.

International policy coordination

Coal is an internationally traded commodity. Consequently, strong interdependencies exist between coal and climate policy decisions in major importing and exporting countries. This creates a range of potentially important and undesirable interactions that could occur between different countries, if the transition away from coal is not guided by some degree of transparent international coordination. This is not a question of returning to a "planned economy" for coal; rather it is a matter of owning up to and coordinating the important policy decisions that have international market spillovers. It can also be seen as reflecting the need for a "consistency check" between the global trajectories for the coal market as a sum result of national policies, and the actual content of national decarbonisation plans as reflected, for instance, in NDCs. Such an approach is also consistent with the logic of collective stock-takes as foreseen under the Paris Agreement.

Related research outputs under the Coal Transitions Project: To better inform policymakers on this issue, DIW-Berlin (a member of the project research consortium) is preparing a specific piece of analysis of global coal market trade flows under alternative global coal demand scenarios using the COALMOD global coal model. This work package highlights the high degree of sensitivity of global trade flows to unilateral changes in national coal demand (either due to climate policy or other drivers). It thus underscores some important risks for major coal exporters under a broad range of scenarios, ranging from 2°C compatible scenarios to enhancements to existing NDCs.

Financing the transition

Coal transitions need not always be a net expense for central governments. Moreover, not all costs need necessarily be supported by taxpayers. Nevertheless, certain aspects of coal transitions will inevitably require dedicated financing from the public sector. There is thus a need for governments to prepare to manage these costs.

There are several aspects to this question, including: how to take early actions to limit the final cost of the tran-

sition? How to ensure private sector stakeholders pay an acceptable share of the costs of transitions? How to mobilise international finance where there is a clear and justifiable need and financing is indeed the bottleneck to moving forward the transition? Etc.

Finance is also a key to the transition because there is ultimately a need to align expectations of key stakeholders about the imminence of the transition. This happens in part through credible policy incentives and governance of the transition. However, the non-availability of sufficient financing to fulfil announced policy goals is obviously an important potential roadblock to progress for various parts of the coal transition (whether labour market, technology deployment, or other).

Related research outputs under the Coal Transitions Project: The project has already aimed to highlight these issues through analysis of the concrete role of financing (for better or worse) in a Synthesis Report on past coal transition experiences, published in June 2017.[1] The question of financing as a potential bottleneck for specific national coal transitions will also be explored *via* the set of 6 country reports on national coal transition scenarios. Each of these reports will present at least one if not several 2°C-compatible coal transition scenarios and discuss the specific enabling conditions for their implementation. Finance will therefore be addressed as relevant within 6 different national contexts.

Coal transitions as a means to raise the ambition of NDCs

The need for a focus on broader coal transition strategies in order to reduce emissions from unabated coal goes to the issue of *how* countries can raise and signal ambition under the Paris Agreement.

Under the Agreement, countries are required to regularly re-evaluate progress towards decarbonising their economies and to revise their nationally determined contributions (NDCs) to increase their ambition every 5 years. As noted above, one important way that countries could revise the ambition of the NDC is by raising their emissions reduction targets. This is indeed necessary: currently the sum total of national governments' emissions targets is clearly inadequate and it needs to be strengthened (UNEP, 2017). Moreover, national emissions reduction targets can be an effective and transparent form of political commitment.

However, as the example of the coal sector above shows, an exclusive focus on emissions targets or simply the technical choices of the transition (e.g. renewables *versus* coal) is insufficient. The overarching goal of the Paris Agreement is to decarbonise our economies and aim for carbon neutrality by the second half of the century. Policymakers therefore need to be focusing on how to remove the underlying barriers and tackle the key challenges to actually implementing the transitions that need to take place for each key emitting sector in our economies. Meaningful steps to removing these barriers—such as the ones described in the case of coal in this brief—may therefore be not only a more comprehensive way to signal ambition, but a more credible way to do so as well.

1 Caldecott, B., Sartor, O., Spencer, T. (2017). Lessons from previous 'coal transitions' - High-level summary for decision-makers. IDDRI – Climate Strategies

More on the Coal Transitions Project

The Coal Transitions Project

The Coal Transition's Project is an international research project, which tries to provide guidance on how policymakers and stakeholders can formulate credible responses to each of the barriers highlighted above. The project, entitled 'Coal Transitions: research and dialogue on the future of coal', is supporting new research by leading energy policy research institutions in six major coal consuming and/or producing countries: China, India, Australia, South Africa, Germany and Poland. It is supported by the KR Foundation, European Climate Foundation and is co-coordinated by IDDRI in cooperation with Climate Strategies.

International Research Institutes participating in the Coal Transitions Project

Project Co-ordinators:

- Institute for Sustainable Development and International Relations (IDDRI)
- Climate Strategies

Country Teams:

- Indian Institute of Management Ahmedabad; Indian Institute of Information Technology Allahabad.
- Institute of Energy, Environment and Economy, Tsinghua University
- Energy Research Centre, University of Cape Town
- Crawford School of Public Policy, Australian National University; Melbourne Sustainable Society Institute, University of Melbourne
- Institute for Structural Research (IBS)
- German Institute for Economic Research (DIW Berlin)

Summary and timing of main project outputs

	Work Package	Timing
1	Historical case studies of past coal transitions and analysis of keys to building regional industrial resilience	Published June 2017 (historical case studies) Published November 2017 (regional economic resilience study)
2	Modelling of global coal market under alternative national transition policy scenarios	Scheduled for January 2018
3	National coal transition reports and project synthesis report	Scheduled for March 2018 (country reports) and May 2018 (synthesis report)
4	Stakeholder outreach and engagement	Ongoing.

References

- Allen, M. *et al.* (2014). IPCC Fifth Assessment Synthesis Report-Climate Change 2014 Synthesis Report. Available at: http://www.citeulike.org/ group/15400/article/13416115 [Accessed August 9, 2016].
- Center for Climate and Energy Solutions, Coal (n.d.) Center for Climate and Energy Solutions. Available at: https://www.c2es.org/energy/source/coal#Resources [Accessed April 2, 2017].
- Caldecott, B., O. Sartor, T. Spencer (2017). Lessons from previous coal transitions : High level summary for decision-makers, IDDRI and Climate Strategies, Paris and London, June 2017. http://www.iddri.org/Publications/Rapports-and-briefing-papers/COAL_SynthesisReport_v04.pdf
- IEA (2016a). World Energy Outlook 2016, International Energy Agency, Paris https://www.iea.org/newsroom/news/2016/november/world-energy-outlook-2016.html
- IEA (2016b). Can carbon capture and storage unlock unburnable carbon ? IEA Report 2016/05, International Energy Agency, Paris. http://www.ieaghg.org/exco_docs/2016-05.pdf)
- McGlade C. and Ekins P (2015). The geographical distribution of fossil fuels unused when limiting global warming to 2°C. Nature, 517(7533), 187-190. http://www.nature.com/nature/journal/v517/n7533/full/nature14016.html)
- Randall, T. (2015). Fossil Fuels Just Lost the Race Against Renewables. Bloomberg. Available at: http://www.bloomberg.com/news/articles/2015-04-14/fossil-fuels-just-lost-the-race-against-renewables
- UNEP (2017). The Emissions Gap Report 2017 : A UN Environment Synthesis Report, United Nations Environment Program, November 2017 https://wedocs.unep.org/bitstream/handle/20.500.11822/22070/EGR_2017.pdf

COAL TRANSITIONS:
RESEARCH AND DIALOGUE ON THE FUTURE OF COAL

Coal Transitions is a large-scale research project leaded by Climate Strategies and The Institute for Sustainable Development and International Relations (IDDRI) and funded by the KR Foundation.

The project's main objective is to conduct research and policy dialogue on the issue of managing the transition within the coal sector in major coal using economies, as is required to achieve the goals of the Paris Agreement.

THIS PROJECT BRINGS TOGETHER RESEARCHERS FROM AROUND THE GLOBE, INCLUDING AUSTRALIA, SOUTH AFRICA, GERMANY, POLAND, INDIA AND CHINA.

www.coaltransitions.org

Climate Strategies

IDDRI