Fossil Fuel Mineral Wealth and Climate Change Law: Expectations of Coal Mine Development in a time of Decarbonization

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Abstract
International climate change law embodied in the United Nations Framework Convention on Climate Change and the Paris Agreement entails commitments to reduce the emission of greenhouse gases, mainly from the use of fossil fuels. The development of fossil fuel mineral resources, especially coal, is becoming less attractive. Although it can be argued that countries, especially developing countries, should have a right to develop their coal resources, there is no general exception to the international agreements to that effect. The agreements address emissions and do not directly prevent fossil fuel extraction at the present. Emission reduction measures are not the only factors causing uncertainty in international coal markets. No tenable argument can be made for exceptions to the climate change agreements on the basis of the right to development, sustainable development, or permanent sovereignty over natural resources; and pressure to reduce the use of fossil fuels, at the corporate level or in international affairs, is legitimate and to be expected. A low-carbon future means changes for mining, and coal mining in particular does not have a legal claim to business-as-usual immune from international efforts to reduce harm to the climate.

Keywords: climate change; international climate change law; UNFCCC; Paris Agreement; fossil fuels; mineral resources; coal; coal markets; right to development; sustainable development; permanent sovereignty over natural resources;

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Laws and policies are being implemented around the world to mitigate harm to the global climate, and they are spreading as countries address the commitments they have made under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. These mitigation measures – whether carbon taxes, emissions trading schemes, renewable incentives or energy efficiency actions – aim to reduce the emission of greenhouse gases, primarily by reducing the use of fossil fuels. Businesses and policy makers must consider the inevitable effects of these mitigation measures. One set of effects is upstream, on the development and extraction of fossil fuel resources. Climate change mitigation measures make it harder to find markets to justify the development of oil, natural gas and coal resources. Companies or countries holding such resources can ask whether they can properly be prevented from benefiting from their mineral assets. A developing country can ask whether it should be prevented from using its mineral endowment to lift its people out of poverty.

The question that this article examines is whether climate change law, especially the international conventions, provide some general exception from its mitigation efforts to allow countries, especially developing ones, to continue with coal and other fossil fuel development and benefit from their mineral endowment. Do countries, especially developing countries, have a right or expectation to extract fossil fuels, to have a market for them, and to have climate change mitigation measures shaped around that right, or to have compensation in lieu? The analysis shows that as a matter of general principle there is no such exemption, express or indirect, in the international conventions, and no supervening right derived from rights to development, sustainable development or resources sovereignty. The need to make a just

transition, and the legitimate claims of developing countries, can be addressed without reading down climate change commitments.

Coal deserves special attention for several reasons. It is abundant and geographically dispersed relative to oil and gas, and it has lower economic rents, in terms of the cost of extraction and transport relative to its market value.[1] It is carbon intensive, in that compared to natural gas nearly twice as much carbon dioxide per unit of energy is emitted burning it. It produces considerable local air pollution that if uncontrolled can cause great harm to human health. At the same time, tackling coal is an enormous political challenge; globally it employs about 8 million people and creates revenues of more than $US900 billion a year.[2]

The World Coal Association gives an example of current advocacy for fossil fuels. It expresses support for climate action, the Paris Agreement, the Sustainable Development Goals, and a transition to clean energy.[3] But its support is on terms; it declares that clean energy does not mean moving away from coal, rather, there should be policy neutrality among fuels, and policy should encourage technology such as high efficiency combustion, and carbon capture, use and storage. It argues that the reduction of emissions as something that must be done in conjunction with alleviating energy poverty (or providing affordable energy) in which coal plays a critical role.[4] In developing and emerging economies, coal is said to be essential to development and has a key role in providing energy security and reducing energy poverty. For coal production and exporting, special benefits can be identified; coal-related investments can help countries meet specific SDGs to promote universal access to affordable electricity in the poorest parts of the world, and the tax and royalty revenues raised from coal production provide for vital public services such as health and education.[5] Should a developing country such as Indonesia not then be entitled to develop its own coal resources to generate affordable and reliable electricity to fuel its growing economy?[6]

What one sees here is an argument about natural resources sovereignty and the right to develop fossil fuel resources even in the face of the climate change challenge. The spokesperson for a development bank can say that countries must be given the right to develop their own natural resources, and that countries and institutions that cut coal funding are unfairly penalizing poorer countries.[7] It is declared that a state has a sovereign right to exploit its own resources, and can use its mineral assets to meet its many development needs, including energy poverty.[8] Otherwise, it is argued, we will observe a spectacle of stranded assets, or even stranded nations, where resources under the ground become commercially unviable to extract and a substantial

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[1] Thijs van de Graaf and Benjamin K Sovacool, *Global Energy Politics* (Cambridge, UK: Polity, 2020); P Collier and AJ Venables, "Closing Coal: Economic and Moral Incentives" (2014) 30 Oxford Review of Economic Policy 492.

[2] M Jakob, J Steckel, F Jotzo, B Sovacool, L Cornelsen, R Chandra, O Edenhofer, C Holden, A Löschel, T Nace, N Robins, J Suedekum, J Uprelainen, "The future of coal in a carbon constrained climate" (2020) Nature Climate Change, https://doi.org/10.1038/s41558-020-0866-1.

[3] World Coal Association, "COP25 media statement" 29 November 2019; World Coal Association, "Coal and the Sustainable Development Goals Roundtable" 26 March 2018, London, available www.worldcoal.org.

[4] Benjamin Sporton (CEO, World Coal Association) "Developing Economies Need Power from Coal" Financial Times, 21 August 2015; Glen Kellow (CEO, Peabody Energy) "The Surprisingly Sustainable Case for Coal" 14 March 2019, available www.peabodyenergy.com.

[5] Paul Baruya, "The Economic and Strategic Value of Coal" (International Energy Agency Clean Coal Centre, 2019).

[6] Benjamin Sporton (CEO, World Coal Association) "Developing Economies Need Power from Coal" Financial Times, 21 August 2015.

[7] Climate Home News, 2 June 2014, "African Development Bank refuses to quit coal funding".

[8] United Nations University, Institute for Natural Resources in Africa, "Africa's Development in the Age of Stranded Assets" (Discussion paper, 2019) p 37.

share of a nation's wealth loses its value.[9] In particular, resource-rich African countries continue to suffer from commodity price volatility, including carbon market risks, they risk losing revenue and to having stranded assets on their hands.[10] Climate change is an emergency, it is argued, but Africa's development should not be a casualty. Similarly in Australia there is a bipartisan political support for mineral production and export and for the jobs, taxes and royalties that they produce.[11] Iron ore, coal and natural gas are the country's top goods exports, and the dominance of natural resources in the export mix is only increasing.[12]

1. The International Agreements and Fossil Fuels

The relevant international law is the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol and Paris Agreement made pursuant to it.[13] The Kyoto Protocol concerned the period 2008-2012, so for most purposes it is part of the historical record. Any claims about what international law on climate change requires must be rooted in the text of those agreements. In the UNFCCC, in article 2, countries agreed on an ultimate objective of achieving stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The primary commitment to that end was in article 4(1)(b) to formulate national programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of GHGs, and measures to facilitate adequate adaption to climate change. The developed country parties went further in article 4(2) and promised national policies and measures to mitigate climate change and limit greenhouse gas emissions. These were the fundamental commitments in 1992. The rest of the Convention can be described as facilitating, directing, and qualifying these commitments; the parties agreed to research, inventories, technology development, technology transfer, education, scientific co-operation, financing. There is nothing in the Convention about preventing or restricting countries from extracting their mineral resources.

The heart of the Kyoto Protocol of 1998 was the quantified emission limitation and reduction commitments in article 2(1) that were made by the Annex I parties, essentially, the developed countries. All parties agreed in article 10 to continue to formulate, implement, publish and update national programmes containing measures to mitigate climate change and measures to facilitate adequate adaptation to climate change. Again there was nothing about restricting countries from extracting their mineral resources.

In the Paris Agreement of 2015 the parties agreed to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit

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[9] James Cust, David Manley, and Giorgia Cecchinato, "Unburnable Wealth of Nations" Finance & Development (March 2017), based on David Manley, James Cust, Giorgia Cecchinato, "Stranded Nations? The Climate Policy Implications for Fossil Fuel-Rich Developing Countries" Policy Paper 34, Oxford Centre for the Analysis of Resource Rich Economies (rev 2017).

[10] United Nations University, Institute for Natural Resources in Africa, "Africa's Development in the Age of Stranded Assets" (Discussion paper, 2019) p 37.

[11] Minerals Council of Australia, "Labor's support for Australian mining welcomed by MCA" media release 29 October 2019.

[12] Department of Foreign Affairs and Trade (Australia), *Composition of Trade Australia 2018-19*, p 5: in 2018-19, iron ore & concentrates, $77.2 billion, 20.7% share; coal, $69.6 billion, 18.7% share; natural gas, $49.7 billion, 13.3% share. The resources share of goods exports has increased from a share around 50% in 2000 to one of 70% in 2018: Minerals Council of Australia, *The Next Frontier: Australian Mining Policy Priorities* (2019) p 30.

[13] United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107; Kyoto Protocol (adopted 11 Dec 1997, entered into force 16 Feb 2005) 2303 UNTS 162; 37 ILM 22; Paris Agreement on Climate Change (12 Dec 2015, entered into force 4 Dec 2016) 55 ILM 740.

the increase to 1.5°C. The parties agreed in article 4(2) each to make a nationally determined contribution towards these goals, and to pursue domestic mitigation measures with the aim of achieving them. The voluntary nature of these contributions was a central feature of the Paris Agreement; each party chose what contribution to make rather than having a reduction target imposed on it on a take-it-or-leave-it basis. Parties had a great deal of discretion to determine the nature and ambition of their contributions, and the manner in which they would meet them. They could include commitments to reduce fossil fuel production if they chose, but, again, we see that they were not required to do so.

Even if this is all rather self-evident, it is desirable to be sure of the basic principles. International climate law does not restrict countries from extracting their mineral resources. What it does is embody commitments that countries have made to reduce their GHG emissions, most of which come from the burning of fossil fuels. There are no restrictions put on the production of fossil fuel minerals. (That supply and demand are related is a matter we can come to shortly.) The commitments that countries made were voluntary; countries were not obliged to enter into the agreements, they were not compelled to be Annex I countries under the Kyoto Protocol, and they were not told what nationally determined contribution to make under the Paris Agreement. Certainly countries will bring different agendas and levels of concern to the negotiations, but it is basic that it is state parties who decide on commitments, not some separate all-powerful international law that can impose obligations from outside. The Paris Agreement was notable for the flexibility and autonomy that it left in state parties' hands to decide on what commitment they would offer.

It is also elementary that the continuing effort to reduce GHGs is a well-founded one. Negotiators relied on the extensive work of the Intergovernmental Panel on Climate Change and the comprehensive reports it has prepared since 1988 to inform decision makers. How far the IPCC could go in its reports and evaluations was closely examined and restricted from both scientific and political points of view.

1.1 *Constant Focus on the Needs of Developing Countries*

Should international climate commitments be qualified or read down for failure to take the special needs of developing countries into account? In truth, those needs have always been recognized, and accommodating them has been a constant concern in climate diplomacy. Negotiations have always entailed conflicts about what contributions different countries should make to mitigating GHG emissions. The developed countries have sought universal participation in tackling the problem that all countries share in common, while the developing countries have strenuously resisted any restriction on their right to develop. They have pointed to their limited capacity to respond to the climate problem, asking the developed countries to shoulder more of the load. In addition, they have pointed to history and the fact that most of the GHGs already in the atmosphere were produced by the developed countries over the decades when they went through the process of industrialization and then enjoyed its benefits. The developing countries have therefore demanded justice in not being asked to clean up a problem that the developed world has created. This conflict between the different blocs of countries stalled progress on climate over extended periods, it jeopardized universal participation in climate action, and it jeopardized the much-needed timeliness of action. Universality and timeliness are the two critical determinants of an effective climate regime.[14]

All three of the main climate law instruments recognized and provided for the differences between countries and the particular needs of the developing countries. The UNFCCC in 1992 kept an unremitting focus on the needs of developing countries, right from

[14] Lavanya Rajamani, "The Principle of Common but Differentiated Responsibility and the Balance of Commitments under the Climate Regime" (2000) 9 RECIEL 120.

its first declaration of principles in article 3, emphasizing sustainable development, declaring that full consideration was to be given to the specific needs and special circumstances of countries, especially developing countries, that would have to bear a disproportionate or abnormal burden under the Convention. Sustainable development was to be promoted, taking into account that economic development and growth are essential.

The quantified emissions reduction commitments made in the Kyoto Protocol were assumed by the developed countries only. The developed countries in articles 11 and 12 promised new financial resources and support through the clean development mechanism. The developing countries only made general commitments to national programmes, technology diffusion, education, and the like. The result was a deepening of the distinction between developed and developing countries, a distinction that thwarted progress and was becoming less and less valid as a way of classifying countries and their capabilities; but at least it was a distinction that ensured that developing countries were protected. Climate negotiations over the next fifteen years bogged down because of conflict over developing country participation. Many developed countries, including the United States, wanted prospering countries to take on binding targets even if they were on the developing country list, but China and the G77 group resisted what they saw as a divide-and-rule strategy.

The Paris Agreement continued to provide for differentiation between countries, but in a much more nuanced form that reduced tensions and opened up the pathway to significant new progress.[15] All countries are now engaged in making commitments, in the form of their nationally determined contributions to the fight against climate change; the Agreement follows a "bounded self-differentiation model."[16] Nonetheless the distinction between developed and developing countries is carried forward, even if it is not as sharp and rigid as it had been. The Agreement emphasizes the right to development (in the Preamble), sustainable development (articles 4(1), 6(4), 6(8)) and the duty of developed countries to take the lead (article 4(4)).

A key concept that emerged in climate change negotiations to express the relationship between the different parties was that of "common but differentiated responsibilities and respective capabilities." It first appeared in 1992 in the UNFCCC:[17]

> The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

Commonality expressed the global reach of the problem of climate change, knowing no borders, and differentiation provided a basis for legitimizing contributions that were asymmetrical because of different capacities and because of different historical contributions to the problem.[18] The principle is all-pervasive in the UNFCCC, and it was reaffirmed in article 10 of the Kyoto Protocol. However it depended on differentiation by categories of parties with different commitments, which made it difficult to carry negotiations forward.[19] Although the principle is reaffirmed in the articles 2(2) and 4(3) of the Paris Agreement, it is less prominent because the Agreement in effect implements it by allowing differentiation in nationally-

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[15] Lavanya Rajamani, "Ambition and Differentiation in the 2015 Paris Agreement: Interpretative Possibilities and Underlying Politics" (2016) 65 ICLQ 493.

[16] Lavanya Rajamani, "Ambition and Differentiation in the 2015 Paris Agreement: Interpretative Possibilities and Underlying Politics" (2016) 65 ICLQ 493.

[17] UNFCCC Art 3(1); also Art 4. The concept appeared simultaneously in the Rio Declaration.

[18] Lavanya Rajamani, "The Principle of Common but Differentiated Responsibility and the Balance of Commitments under the Climate Regime" (2000) 9 RECIEL 120.

[19] Tuula Honkonen, "CBDR and Climate Change" p 142 in Daniel Farber and Marjan Peeters, eds, *Climate Change Law* (Cheltenham: Edward Elgar, 2016).

determined contributions. The principle suggests some that developing countries should have more time to reach the contribution levels of other countries, but it does not provide any general protection for fossil fuel production.

Financial resources for developing countries have been promised to address the different capabilities of countries. In the UNFCCC the developed country parties committed themselves in articles 4 and 11 to providing financial resources and instituted a funding mechanism. The Kyoto Protocol's Clean Development Mechanism (article 12) was devised to assist developing countries in achieving sustainable development and contributing to the ultimate objective of the Convention. However funding did not really become part of the key debates until 2007 and particularly with Cancun agreements of 2010 which established the Green Climate Fund; and since then something of a web of climate financing funds has emerged.[20] The Paris Agreement continued to commit developed countries in article 9 to provide financial resources to help developing countries with mitigation and adaptation. In addition, it provided for technology transfer and capacity building measures to enable countries to develop rapidly, to make abundant high-quality energy services available to their people, with lower emissions than they would make if they unselectively followed the paths that the developed countries followed decades ago. The purposes of financial and related resources is consistently mitigation, in order to avoid emissions while meeting energy needs, and adaptation, in order to cope with the changing climate. It has never been to perpetuate emissions or to compensate for lost markets for fossil fuels.

1.2 *Impact of Response Measures on Countries Highly Dependent on Fossil Fuel Production*

The notion that international climate rules should not prevent countries from benefitting from their mineral wealth may seek support in references to countries that are highly dependent on fossil fuel production, but the support is more imaginary than real. In the UNFCCC the main commitments were accompanied by an undertaking in article 4(8) as follows.[21]

> In the implementation of the commitments in this Article, the Parties shall give full consideration to what actions are necessary under the Convention, including actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change and/or the impact of the implementation of response measures, especially on …
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> (h) Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products".

Similarly, in the Kyoto Protocol it was agreed that Annex 1 parties would strive to implement policies in such a way as to minimize adverse effects on other Parties, especially developing country parties, particularly those identified in Article 4, paragraphs 8 and 9 of the UNFCCC.[22] So that includes economies highly dependent on fossil fuel production.

We must read the text of these provisions on the impacts of response measures carefully. They must be read in context. They do not provide an exemption, let alone a guarantee. They identify certain kinds of developing countries whose needs and concerns are to be considered in implementing the commitments made, and they bundle up impacts on fossil fuel exporters with the adverse effects of climate change itself. They do not over-ride the commitments to limit anthropogenic emissions of greenhouse gases; rather, they identify matters to be considered in doing so. In addition, the Article 4 commitments are mostly commitments of

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[20] Francesco Sindico, "The UNFCCC: Legal Scholarship in Four Key Areas" p 217 in Daniel Farber and Marjan Peeters, eds, *Climate Change Law* (Cheltenham: Edward Elgar, 2016).

[21] UNFCCC Art 4(8). Similarly as to implementation see Art 4(10).

[22] Kyoto Protocol Art 2(3). Similarly as to implementation see Art 3(14) and as to mitigation programmes Arts 10 and 11.

effort, made to the extent practicable, rather than commitments of result.[23] Moreover, the list of countries and matters in article 4(8) from (a) to (i) is a fairly long one, and it conflates some very different things: small island countries, landlocked countries, transit countries, and countries with various kinds of areas: low-lying coastal, arid or semi-arid, forested, liable to forest decay, prone to natural disasters, drought, desertification, high urban air pollution, fragile ecosystems, and mountain ecosystems. Much of the world fits into one or more of these categories, so the guidance that the article provides is rather general in its nature. Moreover article 4(8)(h) lists high dependence on fossil fuel consumption along with production. All in all, fossil fuel production dependence is but one consideration among many, and cannot be given any real prominence in relation to the specific commitments of the UNFCCC or Kyoto Protocol. Any careful legal analysis reads the fossil fuel production provision in context. The tail does not wag the dog.

Article 4.8's provision as to the impact of response measures was included because members of the Organisation of Petroleum Exporting Countries (OPEC) required it in exchange for their support for the Convention.[24] Other aspects of the article reflect the concerns of the Alliance of Small Island States (AOSIS) and the broader G77/China group of less-developed countries of which OPEC and AOSIS formed part. OPEC states initially argued they were entitled as a legal right to monetary compensation for lost oil revenues. Their negotiation stance was that other items under article 4.8 could only be advanced if there was equal progress on their claims. These tactics hindered efforts to provide support for states vulnerable to the adverse effects of climate change; there was deadlock and years of delay. OPEC's efforts came at a direct cost to small island states and other less-developed countries. Even when it became clear that OPEC members would not obtain monetary compensation, they continued to resist mitigation efforts, and argued for measures that would minimize the impact on them: removal of subsidies on coal production and taxes on oil use in developed countries; taxes in developed countries to reflect the carbon content of fuels; discouragement of fossil fuel production in developed countries; assistance for oil exporting countries to diversify; increased use of carbon sinks, finance for carbon storage and finance to reduce upstream waste in energy production. However, over time the debate about response measures evolved and broadened, and from 2010-2011 the main subject of the debate shifted to international trade and the effect of unilateral response measures on goods and services from developing countries.[25] The OPEC arguments for countries rich in fossil fuels were no longer high on the agenda.

By the time of the Paris Agreement in 2015, the influence of oil-exporting countries was much less evident. The Agreement avoided the hard distinction between developed and developing countries, reflecting that it was no longer a good fit for international circumstances. The impact of response measures on fossil fuel production was not identified as a consideration. Instead, in the Preamble the parties simply recognized that states may be affected by the impacts of the measures taken in response to climate change, and they recognized the right to development. They agreed in article 4(15) to take into consideration the concerns of parties most affected by the impacts of response measures, particularly developing country parties.

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[23] Lavanya Rajamani, "The United Nations Framework Convention on Climate Change: a Framework Approach to Climate Change" p 205 in Daniel Farber and Marjan Peeters, eds, *Climate Change Law* (Cheltenham: Edward Elgar, 2016) at 208.

[24] Jon Barnett and Suraje Dessai, "Articles 4.8 and 4.9 of the UNFCCC: Adverse Effects and the Impacts of Response Measures" (2002) 2 Climate Policy 231.

[25] Chris Wold, Don Gourlie and Amelia Schlusser, "Climate Change, International Trade, and Response Measures: Options for Mitigating Climate Change without Harming Developing Country Economies" (2014) 46 Geo Wash Int'l L Rev 531, note that the Cancun Agreements of 2010 included commitments by developed countries to avoid response measures that would have negative impacts on developing countries, but in the subsequent process the issues raised by parties increasingly concentrated on trade issues.

This is certainly recognition of the effect of climate law, but it is unequivocally part of carrying out an agreement to combat climate change and reduce emissions. Again, the tail does not wag the dog.

The approach of fossil-fuel exporting countries had changed too. The World Coal Association took a positive line on the Paris Agreement, supporting the global movement to reduce emissions, and declaring that there is a pathway towards zero emissions from coal, which will be significant in the energy mix for decades, through high efficiency combustion, towards carbon capture, use and storage.[26] OPEC welcomed the Agreement, supporting sustainable development, and the alleviation of poverty, especially energy policy, and making no mention of compensation or the adverse impacts of response measures.[27] OPEC now seeks a just energy transition that recognizes the role of oil and different national circumstances. It urges that there be no discrimination among energy sources and that the transition is not a transition from one energy source to another. It emphasizes technology to eliminate emissions and ensuring that proven oil reserves are not stranded. It takes pride in a constructive role in climate negotiations and in a good relationship with the UNFCCC Secretariat.[28]

International law therefore never saw an exception for fossil-fuel exporting countries, or a right to compensation for the impact of climate change mitigation measures; and international negotiations no longer see any effort from the major players to argue along those lines.[29] More generally, it is plain that the primary purposes of international climate law is to protect the climate by encouraging and enabling reductions of the emission of greenhouse gases, and to enable countries to adapt to climate change. The responsibility to do these things is a common one, shared by the whole international community; it is to reduce emissions. The responsibility is differentiated, but the differentiation is around degrees of ambition to reduce emissions and degrees of support to reduce emissions. The differentiation is not about allowing fossil fuel production to prevail over emissions reductions.

1.3 *Supply-Side Measures: Proposals for Closing Coal*

As this analysis has made clear, the UNFCCC and the Paris Agreement are concerned with the emissions of GHGs and the contributions of Parties to make reductions of emissions, and not with fuels or their extraction upstream. Perhaps this will change. We have recently come to understand the relationship between the global climate system's capacity to take more GHGs (especially carbon dioxide), the emissions reduction targets that we adopt, and the amount more fossil fuel that we can burn. Carbon dioxide can last for thousands of years in the atmosphere and oceans, so the accumulated effects of its emissions come up against planetary boundaries. Studies in 2014 and 2015 showed that globally a third of oil reserves, half of gas reserves and over 80 percent of current coal reserves should remain unused from 2010 to 2050 if we are to have an even chance of limiting global warming to 2°C.[30] In order to avoid major climate

[26] World Coal Association, Climate Change Position Statement (viewed 25 May 2020); World Coal Association, COP25 Media Statement, 29 Nov 2019.

[27] OPEC Bulletin Commentary, January-Febrary 2016.

[28] Statement by Mohammad Sanusi Barkindo, OPEC Secretary General, at the UN Climate Change Conference (COP 23/CMP 13/CMA 1-2), 16 November 2017, Bonn; statement to the UN Climate Change Conference (COP24) by Mohammad Sanusi Barkindo, OPEC Secretary General, at the UN Climate Change Conference (COP24/CMP14/CMA1.3), 12 December 2018, Katowice; OPEC Bulletin, Special Edition 4/19, 2019.

[29] For the sake of completeness, art 8 of the Paris Agreement on loss and damage may be noted; but it concerns loss and damage "associated with the adverse effects of climate change".

[30] C McGlade and P Ekins, "The geographical distribution of fossil fuels unused when limiting global warming to 2°C" (2015) 517 Nature 187, and C McGlade and P Ekins, "Un-burnable oil: an examination of oil resource utilisation in a decarbonised energy system) (2014) 64 Energy Policy 102. Their results did not change much even if they factored in widespread carbon capture and storage.

change, we must therefore leave most known fossil fuel resources in the ground.[31] Naturally enough, this idea of unburnable coal and oil has created a stir, because of its far-reaching implications for the value of fossil fuel assets, for the companies that own them, and for government policy towards fossil fuel development.

There has been a recent uptake of interest in the arguments for tackling climate change with policies aimed at the supply of fossil fuels.[32] Collier and Venables argue that a global policy for a sequenced closure of coal mines to reduce the supply of fossil fuels would be effective, both on moral and economic grounds, especially as any successful strategy for combating global warming is sure to see the substantial closure of coal.[33] Such a policy would have to be an international one, even if as they suggest it could be initiated by a coalition of the willing without waiting for the entire international community to agree; there is no evidence that supply-side constraints at a national or regional level can reduce global emissions. But any such policy lies in the future. Perhaps it could be delivered through the UNFCCC process (as could policies such as transparency on fossil fuel extraction subsidies) even though the UNFCCC's core concern is emissions and removals. But there is no sign of any interest in climate diplomacy at this point in rules that would dictate which coalfields can and cannot be developed; the target continues to be the emissions of greenhouse gases.

2. Indirect Effects

If, as we have seen, climate change law does not directly affect the ability of countries to benefit from their mineral endowments, does it have an indirect effect? And are any indirect effects of climate change mitigation illegitimate, either as being contrary to law or as being unjustifiable? The logic of this claim need a bit of unpicking. Is there any real chain of causation here at all? The indirect effect, of course, is that suppressing demand reduces opportunities to supply. Fossil fuels are extracted and sold to meet demand; they are burned and the resulting emissions of greenhouse gases affect the climate; and restrictions on emissions cause restrictions on burning fossil fuels, and so reduce the demand for them. While in one sense this is straightforward, there are several complicating factors.

For one, the link between GHG targets and coal and oil and gas consumption is not a direct one. National governments have choices in how to meet their GHG commitments. They may reduce or cap coal consumption, to be sure, but they may concentrate on energy efficiency policy measures, they may shift to better classes of coal, or they may investigate carbon capture and storage (CCS) which might increase coal consumption while reducing emissions. They may rely on offsets from land use, land use change and forestry (LULUCF). Metallurgical coal will always be hard to replace, but thermal coal for process heat and electricity generation will always be a prime candidate for reductions, because it has high GHG emissions per joule of energy produced, and because it is substitutable in many applications. National governments are also aware of the heavy burden that poorly-managed combustion of coal (and, to a lesser extent oil and gas) places on air quality and the health of their citizens, especially in crowded cities.

Another weak link in the supposed chain of causation between climate change law and ability to benefit from mineral endowments is the state of global markets for coal and other

[31] James Hansen, *Storms of My Grandchildren* (London: Bloomsbury, 2009) p 172.

[32] Fergus Green and Richard Denniss, "Cutting with Both Arms of the Scissors: the Economic and Political Case for Restrictive Supply-Side Climate Policies" (2018) 150 Climate Change 73; G Piggot, C Verkuijl, H van Asselt and M Lazarus, "Curbing Fossil Fuel Supply to Achieve Climate Goals" (2020) 20 Climate Policy 881 (special issue editors).

[33] P Collier and AJ Venables, "Closing Coal: Economic and Moral Incentives" (2014) 30 Oxford Review of Economic Policy 492.

fossil fuels. Although coal is used globally in enormous quantities, the future demand for it is uncertain with or without climate change law. Coal project developers have no assurance that there will be a market for additional coal. It is essential to be realistic about the commercial situation. Companies have choices in how to meet their energy needs, and they do not always choose coal.

Global coal use rose in 2017-2018, with the increase coming mainly from China, India, Indonesia and other countries in South and South East Asia.[34] In contrast, coal demand in the United States, Japan and Europe has declined substantially; between 2017 and 2018 it dropped 4.3%, 1.2% and 5.1% respectively; in Canada the drop was 15.1%.[35] In such advanced economies, coal is being steadily squeezed out of the energy mix by a mixture of environmental policies (both climate and non-climate policies), price pressure from natural gas, and increasingly-competitive renewable sources. Natural gas is often more attractive to companies than coal; it needs no materials handling facilities (with accompanying delay and high capital requirements), it burns more cleanly and is therefore easier to take through environmental permitting processes, and it can ramp up and down more quickly to respond to fluctuations in demand for heat or electricity. Renewable energy sources have often had a boost because of energy and climate change policies, but it is essential to absorb the fact that they are increasingly commercial and profitable without a subsidy of any kind. Many renewable developments, such as wind, are more easily scaled up to meet uncertain market demand than a coal plant.[36] Furthermore, in the use of energy, many customers are reaping energy efficiency gains, reducing the amount of fuel they need to operate.

As for the future outlook, for the period between now and 2024, the International Energy Agency considers that demand for coal is no more than stable, and that investments in new coal projects face strong headwinds.[37] For further out, the IEA scenarios are no more attractive for new coal projects.[38] The Current Policies scenario suggests that a gradual rise in demand would continue to 2040, with demand from South and South East Asia a particularly strong element, along with demand for metallurgical coal. However under the Stated Policies Scenario demand would be flat. The strongest contrast, however, is the Sustainable Development Scenario, under which coal demand would plunge. Climate policies and carbon pricing are one reason, but so are strong policy pushes, such as in China, to improve air quality. CCS could open the door for coal consumption under strict climate laws, but its deployment has barely begun.

Coal continues to be the main fuel globally for electric power generation at 38% of overall generation. Coal power generation increased 3% in 2018 (similar to the 2017 increase), and for the first time reached the level of 10,000 TWh. But investment in coal-fired power has declined by nearly 3% to the lowest level since 2004. Coal-fired power plant receiving final investment decisions declined by 30%, to the lowest level since 2000. Most final investment decisions are now for high-efficiency plants, with less efficient subcritical plants comprising only 10%.[39] The average efficiency of the coal-powered power fleet has increased steadily over the years, although the trend of efficiency improvement is still under way. The average

[34] International Energy Agency, *World Energy Outlook 2019*, p 221.

[35] International Energy Agency, *Coal 2019: Analysis and Forecast to 2024*, pp 14, 23.

[36] In United States electricity generation, renewables are now matching and eclipsing coal: US Energy Information Administration, *Short Term Energy Outlook September 2020*.

[37] International Energy Agency, *Coal 2019*.

[38] International Energy Agency, *World Energy Outlook 2019*, p 219.

[39] IEA (2019), *Tracking Power*, IEA, Paris https://www.iea.org/reports/tracking-power-2019.

efficiency is around 37.5%, but today's state-of-the-art plants are built to achieve efficiencies of 47.5% and more.[40]

Globally, the trend is one of stagnation in investment in new coal production capacity.[41] Greenfield coal projects are rare and are mostly for metallurgical coal. The main reason is that demand is expected to be relatively stable, with low levels of investment by coal consumers. The financing of new coal projects is becoming more difficult, partly because of the divestment movement. Thermal coal projects are hard to advance; thermal coal is generally a marginal supplier of electricity, so it demand is very sensitive to changes in power demand or the prices of other energy sources; and the effect of climate policies and sentiment is higher for thermal than it is for metallurgical coal.[42] (Metallurgical coal production is much smaller than thermal production.[43]) Companies are responding to these market signals. BHP and Anglo American are reducing their coal exposure; Glencore, the world's largest coal exporter, has capped its coal production and now looks for growth in other commodities necessary for energy transitions; and Rio Tinto has left the coal business altogether.[44] Although many coal-mining projects are under consideration, most of them are unlikely to go ahead before 2024.[45] These moves do not shut down the coal industry; what they suggest is that financing and development of projects will tend to move into the hands of state-owned enterprises and smaller commercial players.

In any event, demand for products is always shifting, and suppliers have no assurance that their product will always be considered valuable. Technical innovation constantly changes the mix of products that can be sold; the market for silver for photographic film has more or less disappeared, and carbon paper is no longer in demand. Some changes are driven by clearer recognition of harms to health and the environment; the market for lead as a fuel additive has gone, and is replaced by a market for methanol-derived additives. New market demand appeared for platinum and palladium to make catalytic converters to reduce air pollution from cars, and that demand may in its turn be displaced by the shift to demand for battery minerals (graphite, lithium, and cobalt) for electric vehicles. Some companies and countries benefit from these shifts in demand, while others find that they are holding stranded assets, or nursing expectations that will not be fulfilled. The more far-sighted players are, the better. It has been plain for some time – since the early 1990s – that demand for fossil fuels would be constrained in order to prevent harm to the global climate. For example, in the 1990s the New Zealand Maori leader Robert Mahuta, negotiating a long-term settlement of the grievances of his tribe, chose not to accept government coal assets.[46]

What we see overall is that there are too many uncertainties, especially in commercial markets, to support the generalization that climate change law limits the ability of countries to benefit from their mineral endowment. There are many good reasons in policy (such as for air pollution) and in commerce (expense, delay) for companies to avoid coal and other fossil fuels. While supply and demand are undoubtedly connected, they are affected by factors other than climate law. In any event, there is a valid rationale for climate measures on their face; the

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[40] Qian Zhu, *Historic Efficiency Improvement of the Coal Power Fleet* (IEA Clean Coal Centre Report CCC/300, 2020.)

[41] International Energy Agency, *Coal 2019: Analysis and Forecast to 2024*, p 132.

[42] International Energy Agency, *Coal 2019: Analysis and Forecast to 2024*, p 135.

[43] By tonnes, in 2018 world consumption of coal was 77% thermal or steam coal, 10% lignite, and 13% metallurgical coal: International Energy Agency, *Coal 2019: Analysis and Forecast to 2024*, p 13.

[44] International Enegy Agency, *World Energy Outlook 2019*, p 240. Anglo American intends to sell its South African coal operations: The Northern Miner, May 25 - June 7, 2020, p 5.

[45] International Energy Agency, *Coal 2019: Analysis and Forecast to 2024*, p 134.

[46] The settlement was implemented by the Waikato Raupatu Claims Settlement Act 1995.

indirect effects are not the result of a colourable attempt to do indirectly that which cannot be done directly. It is entirely arguable that climate change law can and should have indirect effects that reduce the attractiveness of extracting fossil fuels; it does not owe any duty to ensure that markets for fossil fuels will continue.

3. Supervening Rights

Can some right or guarantee for a nation to benefit from its mineral inheritance be set up so as to supervene or cut across climate change law? We must note straight away that countries did not claim any such right when they made their commitments under the UNFCCC, Kyoto Protocol and Paris Agreement, so the claim of any such right or guarantee cannot be sound as a matter of law. But we can examine the claim as an argument about what the law should be. The claim can be put forward on the basis of a right to development, a right to sustainable development, or a right of permanent sovereignty over natural resources.

3.1 *Right to Development*

Firstly, can mineral-rich developing countries rely on a right to development that gives an expectation that climate change law does not apply to them, or entitles them to an exception that allows them to market their hydrocarbon fuel commodities? To be sure, the international community has addressed development as a right on a number of occasions, and the "development decades" of the 1960s and 1970s saw much effort go into the articulation of economic rights and decolonization. Particularly to be noted is the UN Declaration of the Right to Development in 1986 that drew on the developmental dimensions of individual and collective human rights and the right to self-determination.[47] The existence of such a right was contested and its legal status in international law, other than as a General Assembly resolution, has always been disputed; developed countries did not accept interpretations that legally obliged them to give development assistance.[48] In the international politics of the time, assertions of a right to development were associated with socialism, and the notion of a right did not inspire many concrete efforts to implement it.[49] In the 1990s it became more possible to speak of a right to development, and several international conferences made reference to it.[50]

However, a right to development does not guarantee a special place for natural resources industries or their products, and does not guarantee that other countries will buy their products. Mining development cannot be put forward as the only way for a country to advance itself. While natural resources projects can play an important role in economic development, they also have well-known limitations (for example in job creation) and they pose social, economic and environmental risks that can be a challenge to manage.[51] There is also a distinction between the

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[47] United Nations Declaration on the Right to Development, UN Doc. A/RES/41/128, adopted by the UN General Assembly 4 December 1986. The African (Banjul) Charter on Human and Peoples' Rights (adopted 27 June 1981, OAU Doc. CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), entered into force 21 October 1986, drew on right to development ideas: Karin Arts and Atabongawung Tamo, "The Right to Development in International Law: New Momentum Thirty Years Down the Line?" (2016) 63 Neths Intnl L Rev 221.

[48] Subrata Chowdhury, Erik Denters, Paul de Waart, eds, *The Right to Development in International Law* (Dordrecht and Boston: Martinus Nijhoff, 1992).

[49] Karin Arts and Atabongawung Tamo, "The Right to Development in International Law: New Momentum Thirty Years Down the Line?" (2016) 63 Neths Intnl L Rev 221.

[50] For example, the Rio Declaration on Environment and Development, 1992. A/CONF.151/26 (Vol. I), in Principle 3 recognized the right to development as one of its 27 principles: "The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations."

[51] P Collier, *The Bottom Billion* (Oxford: Oxford University Press, 2007); Thijs van de Graaf and Benjamin K Sovacool, *Global Energy Politics* (Cambridge, UK: Polity, 2020) p 88.

right of a nation to develop and the right of a company to operate in a developing country, even if it is a company domiciled there. A nation has many interests, and many needs for its people, while a company has a much narrower set of interests.

3.2 *Sustainable Development*

In the 1980s it was realized that the development ideal needed reorientation, and the concept of sustainable development emerged; development had to be environmentally sustainable, and environmental action had to improve the plight of the poorest people in the world.[52] The concept, from the Brundtland Report through to the Sustainable Development Goals of 2015, has evolved alongside the international response to climate change. What is important to observe is that there is nothing in any articulation of the concept that suggests that sustainability and the needs of future generations are to be advanced by making a fossil fuel development exemption of some kind. Thus the Sustainable Development Goals and 2030 Agenda for Sustainable Development of 2015 mention the right to development twice, but only incidentally, but more explicitly the Resolution affirmed the primacy of the UNFCCC on climate change matters, and declared that "The global nature of climate change calls for the widest possible international cooperation aimed at accelerating the reduction of global greenhouse gas emissions and addressing adaptation to the adverse impacts of climate change."[53] There is no carve-out for development through mineral extraction.

That the right to development must be understood in the context of sustainability and climate change mitigation is seen in the language of the Human Rights Council. When it appointed a Special Rapporteur on the Right to Development in 2016 the mandate it granted specially included: "To contribute to the promotion, protection and fulfilment of the right to development in the context of the coherent and integrated implementation of the 2030 Agenda for Sustainable Development and other internationally agreed outcomes of 2015, including … the Paris Agreement on climate change".[54] In turn, the Rapporteur observed that regional consultations confirmed that the implementation of the right to development involves among other things adherence to internationally agreed frameworks on climate change, development finance and sustainable development.[55] Thus development rights are not regarded as freestanding absolutes but as an element of sustainable development. In particular development is advanced in the context of internationally-agreed frameworks on climate change, the UNFCCC in particular. There are no grounds to suggest that a right to development stands in opposition to international climate law, or provides some exception to the UNFCCC regime.

Muttitt and Kartha[56] inquire usefully into the development ethics of leaving carbon in the ground. The costs and benefits will be borne by different people and different nations. Some economies are dominated by fossil fuel extraction, and others are not; some economies are wealthy enough to pay for a just transition, while others will struggle. For example the USA and India have roughly the same number of coal miners per thousand workers, but the USA has more ability than India to fund a just transition for its miners. The authors propose that the

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[52] Alexander Gillespie, *The Illusion of Progress: Unsustainable Development in International Law and Policy* (London & Sterling VA, Earthscan: 2001).

[53] "Transforming Our World: the 2030 Agenda for Sustainable Development" UNGA Resolution A/RES/70/1, 25 September 2015.

[54] Human Rights Council resolution 33/14 (A/HRC/RES/33/14), 29 Sept 2016, art 14. Karin Arts and Atabongawung Tamo, "The Right to Development in International Law: New Momentum Thirty Years Down the Line?" (2016) 63 Neths Intnl L Rev 221.

[55] Statement by Saad Alfarargi, Special Rapporteur on the right to development, 42nd session of the Human Rights Council, 9-27 September 2019, available www.ohchr.org.

[56] Greg Muttitt and Sivan Kartha, "Equity, Climate Justice and Fossil Fuel Extraction: Principles for a Managed Phase Out" (2020) Climate Policy doi: 10.1080/14693062.2020.1763900.

transition must be both rapid and just; it cannot be one without the other, and the justness is for workers and communities. Extraction should be reduced the fastest where the social costs of doing so are lowest, taking into account the different circumstances of different economies. There is a role for financial support for poor countries, in global benefit sharing, but it does not extend to new extraction projects or avoided new extraction.[57] Chris Armstrong[58] also sees a credible argument in the duty of the international community to foster development, confined of course to bringing citizens out of real poverty and disadvantage, and best fulfilled by providing development finance and new opportunities, rather than by perpetuating fossil fuel production. He sees little merit in any argument by a fossil fuel exporter relying on the principle of compensation where expectations are thwarted by a change in public policy; no international authority has encouraged an expectation of being able to continue to extract fossil fuels, and such an expectation does not have a just or moral claim to continue to cause harm to the atmosphere even if the activity also produces economic benefits.

3.3 *Permanent Sovereignty over Natural Resources*

Related to development is the principle of permanent sovereignty over natural resources. The principle is well-established in international law, affirming that a state has the sovereign right to exploit its own resources.[59] Can it form a basis for an exception or restriction to international climate change law? Not really. For one thing, its basis in UN General Assembly resolutions, and its historical roots in the 1950s and 1960s, is not as strong as that of climate change law based on the specific agreement of countries in an international convention. For another and more specifically, permanent sovereignty has never been said to guarantee a country a market for its natural resources. Nor has it ever promised that the use of materials extracted in the course of exercising sovereignty over resources would be free from regulation of any kind. It has never included an immunity against regulation internationally or by other states to protect environmental, health and safety, or global climate values. What it has asserted is economic decolonization and the rights of countries with natural resources to take their destiny into their own hands and to do away with the one-sided concession agreements that were common in the mid-twentieth century.

Werner Scholtz notes that the preamble of the UNFCCC refers both to climate change as a common concern of humankind and to the sovereign right of states to exploit their own resources pursuant to their own environmental and developmental policies.[60] He points out that sovereignty over natural resources has never been absolute, and must be exercised in the interests of the people and subject to general international law. It is subject to the "no harm" principle under which no significant damage should be caused to other states. He proposes "custodial sovereignty" to convey that a state is custodian of its global environmental resources and natural resources, which other states expect it to protect for the whole of humankind. It can dispose of its resources freely, subject to the expectations and interests of other states, and must pursue sustainable development in its exercise of its rights. The custodial element reconfigures

[57] The authors refer to Ecuador's proposal in 2007 to leave a the Yasuni-ITT oilfield untapped if it could obtain compensation. Such an initiative would be impossible on a global scale, and indefensible as payment not to cause damage to the climate.

[58] Chris Armstrong, "Decarbonisation and World Poverty: A Just Transition for Fossil Fuel Exporting Countries?" (2020) 68 Political Studies 671.

[59] Kamal Hossain and Roy Chowdhury, eds, *Permanent Sovereignty over Natural Resources in International Law: Principle and Practice* (London: Pinter, 1984); Nico Schrijver, *Sovereignty over Natural Resources: Balancing Rights and Duties* (Cambridge: Cambridge University Press, 1997).

[60] Werner Scholtz, "Greening Permanent Sovereignty through the Common Concern in the Climate Change Regime: Awake Custodial Sovereignty?" p 201 in O C Ruppel et al, eds, *Climate Change: International Law and Governance* (Nomos 2013).

permanent sovereignty and greens it. It does not provide an exception or qualification to the climate change commitments that countries have entered into, any more than does the concept of a right to development.

3.4 *No General Fossil Fuel Exception*

The right of development, sustainable development and the principle of permanent sovereignty have had a significant influence on the UNFCCC and Paris Agreement, especially in the respect that the agreements show for state sovereignty and the autonomy of countries in determining their national policies and deciding on their contributions to the global effort. Their influence can also be seen in the care taken in the agreements to respect the differentiated responsibilities and capabilities of developing countries. However they do not provide any kind of additional restriction, implied exception or qualification of the commitments made in those agreements. Nor do they guarantee a market for fossil fuel minerals, a right to non-interference in fossil fuel development or sales, or a right to benefit from mineral resources. It is bad legal reasoning to suggest that there is some vague additional set of exceptions that must be implied to foster trade in fossil fuels. If such exceptions had been agreed on, the agreements would have included them expressly. In simple terms, therefore, the right to development, sustainable development and permanent sovereignty do not prevail over the UNFCCC and the Paris Agreement.

4. Pressure to Reduce the Use of Fossil Fuels

The next question that presents itself is whether it is legitimate to marshal legal, political and social forces to oppose the extraction and use of coal and other fossil fuels. Opposition to fossil fuels takes a number of different forms, and has gained a great deal of momentum.[61] It is no longer on the radical fringe. In 2013 the World Bank Group decided to stop financing coal-fired power plants except in very exceptional circumstances. Other multilateral development banks followed suit to some extent. This constrains finance for coal projects in developing countries, and makes private finance more expensive, because other banks and institutions often follow their stance. The issue is often couched as one of social licence to operate. Coal mining has appeared as a reputational risk for companies for whom coal is not their core business: banks, insurance companies, institutional investors, utilities and broad-based mining companies. The reputational risk aligns with commercial concerns about the long-term profitability of coal assets. The permitting procedures for new projects are complicated by the risk of litigation that can wreak havoc on the time schedules for a mine development project. The departure of large companies means that smaller companies with weaker balance sheets may be the ones seeking coal mine finance.

Whether one agrees or disagrees with such activism, few would claim that companies are not entitled to make their own decisions about how to respond to it. Whether they should come out of fossil fuel extraction, whether it is morally justifiable to do so when they benefit from fossil fuel products, whether their decisions are commercially justifiable, are matters between company executives, directors, and shareholders. Advocates may find ways to put pressure on companies and individuals, and ways to change people's opinions of them, and they may resort to public institutions and legal procedures; but there is nothing illegitimate about that. It is a normal part of the contest of views and the cut-and-thrust of debate in commercial life and a functioning democracy. One can argue in the court of public opinion, and point out the mistakes of one's opponents and adverse consequences of their proposals, and try to change

[61] International Energy Agency, *World Energy Outlook 2019*, p 238; Thijs van de Graaf and Benjamin K Sovacool, *Global Energy Politics* (Cambridge, UK: Polity, 2020) p 133.

people's minds, but there is no point suggesting that companies and individuals can be compelled to stay engaged in fossil fuel extraction and use.

So, too, in international affairs, countries exert such influence as they can on the behaviour of other countries in relation to climate change and fossil fuels. It is normal to do so in any negotiation; countries bring to the negotiating table the issues they are concerned about, knowing that the other party has a list of its own, and seeking to persuade the other party to meet its concerns. What issues are linked and what issues are kept separate is up to them. In climate change negotiations, a fundamental premise of the Paris Agreement was that countries have different interests and circumstances, and they would make different commitments, in their nationally determined contributions to protecting the climate. Critically, they also committed themselves to progressively more ambitious commitments over time.[62] The increase in the commitments and ambition of countries is not across the board by central decision, but country by country. This respects each country's autonomy, but it also enables countries to encourage and assist each other, and to exert influence on each other to make more ambitious commitments. The same goes for other efforts to maintain the viability of the international climate law regime, such as in actual participation in the Paris Agreement and compliance with its terms, and in mechanisms that safeguard a country's efforts to reduce emissions with its policies and measures. Thus in 2019 France, backed up by the European Union, warned Australia that a planned free trade agreement would have to incorporate highly ambitious action on climate change,[63] and it warned Brazil that it would not enter into a free trade agreement with any country not in the Paris Agreement.[64] Negotiations for modern trade agreements usually include far more than conventional trade in goods, and environmental provisions are now common, so there is no room for surprise that a connection with climate change is now raised by countries determined to see more climate action globally.

Also foreseeable in international relations are border carbon adjustments, where a country or bloc imposes a charge on imports of carbon-intensive goods, that is goods such as steel and cement that require large emissions of greenhouse gases to produce. The rationale is that if the country has effective climate change measures, such as a price on carbon, then those measures constrain its domestic producers of steel or cement; but if those materials can be imported freely from countries without such measures then the country's efforts are undermined and the domestic producers are put in an impossible situation commercially. A border carbon adjustment would protect the country's climate change strategy and would also motivate the exporting country to introduce its own climate change measures, so as to avoid the adjustment charge. Although such border charge adjustments have not appeared yet, the European Union has announced plans to introduce some form of them.[65] It is likely that border charge adjustments will be consistent with trade law rules if they are well designed.[66] The Paris Agreement emboldens states to co-operate in putting this kind of pressure on climate laggards.[67] Constraints on the use of fossil fuels are the likely result.

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[62] Paris Agreement arts 4(2) and 4(3). Each party communicates a new nationally determined contribution every 5 years: art 4(9).

[63] Australian Financial Review, "France puts Climate at Heart of any FTA with Europe" 8 November 2019.

[64] Forbes, "Macron's Mercosur Veto - Are Amazon Fires Being Used As A Smokescreen for Protectionism?" 23 Aug 2019.

[65] European Commission, "The European Green Deal" COM(2019) 640 final, 11 December 2019.

[66] There is a considerable literature on the matter: see M Mehling, H van Asselt, K Das, S Droege and C Verkuijl, "Designing Border Carbon Adjustments for Enhanced Climate Action" (2019) 113 Amer J Int Law 433.

[67] D Bullock, "Combating Climate Recalcitrance: Carbon-Related Border Tax Adjustments in a New Era of Global Climate Governance" (2018) 27 Washington Int L J 609.

5. The Low-Emissions Future of Mining

The effects of climate change and decarbonization on mining has been examined recently by McKinsey & Co.[68] Climate is a risk for miners in different ways. First, mining assets are vulnerable to changes in climate, so companies must identify vulnerability to water shortage, flooding, excess heat and other extreme climate events. This is adaptation. Companies must also take action to mitigate their emissions. Some mining equipment is well-suited to electrification, such as underground and on pit-haul roads. Fugitive methane from coal mines is a far greater source of emissions than equipment, and can often be captured before the coal is extracted.[69] Mitigation actions may be necessary to comply with legal requirements, and they may improve social licence, but they often benefit the bottom line as well. Finally, the mining industry must address the shifting demand for minerals that global decarbonization is bringing about. Coal is the most obvious victim of such shifts, and it is about 50 percent of the global mining market. Even metallurgical coal demand will weaken if metal companies switch to hydrogen and biofuels as energy sources. Bauxite, copper and iron ore markets may be constrained by more energy-efficient processing and better recycling on circular economy principles. On the other hand electrification will increase demand for copper and aluminium, and niche minerals for motors, batteries and catalysts could see dramatic growth: cobalt, lithium, nickel, platinum, palladium and rare earth metals. (One 3 MW wind turbine, for example, requires 300 tonnes of steel, 3.4 tonnes of copper, 2 tonnes chromium, along with many kilograms other metals and rare earth metals.[70]) The McKinsey authors conclude that:[71]

> Fully replacing revenues from coal will be difficult. Yet many of the world's biggest mining companies will need to rebalance nondiverse mineral portfolios. … Niche commodities probably will not be able to replace the magnitude of earnings from coal, but they could help manage losses …

This is useful at a high level even if the language of rebalancing a portfolio is unrealistic in describing the options available to a company, or a country, in respect of its natural resources in the ground. In any event there are many new opportunities opening up for resource-rich countries in Latin America and Africa.[72]

6. The Real Agenda

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[68] Lindsay Delevingne, Will Glazener, Liesbet Grégoir and Kimberly Henderson (McKinsey & Co), "Climate Risk and Decarbonization: What Every Mining CEO Needs to Know" January 2020. Among other voices calling for change is Fernando P Carvalho, "Mining Industy and Sustainable Development: Time for Change" (2017) 6 Food & Energy Security 61.

[69] Lindsay Delevingne, Will Glazener, Liesbet Grégoir and Kimberly Henderson (McKinsey & Co), "Climate Risk and Decarbonization: What Every Mining CEO Needs to Know" January 2020 estimate mining greenhouse gas emissions from using diesel, electricity and gas at 450 megatons pa CO_2e, while fugitive methane emissions are 4,620 megatons pa CO_2e. The "scope 3" emissions from the use of minerals in downstream industries are vastly bigger, 14,370 megatons pa CO_2e.

[70] J Drexhage, D La Porta, K Hund, *The Growing Role of Minerals and Metals for a Low Carbon Future* (World Bank, 2017) p 64.

[71] Lindsay Delevingne, Will Glazener, Liesbet Grégoir and Kimberly Henderson (McKinsey & Co), "Climate Risk and Decarbonization: What Every Mining CEO Needs to Know" January 2020 p 5.

[72] J Drexhage, D La Porta, K Hund, *The Growing Role of Minerals and Metals for a Low Carbon Future* (World Bank, 2017) observe that wind, solar, hydrogen and electricity systems are more materials-intensive than their traditional counterparts. Also Morgan Bazilian, "The Mineral Foundation of the Energy Transition" (2018) 5 Extractive Industries and Society 93; Benjamin K Sovacool, Saleem H Ali, Morgan Bazilian, Ben Radley, Benoit Nemery, Julia Okatz and Dustin Mulvaney, "Sustainable Minerals and Metals for a Low-Carbon Future" (2020) 367 Science (issue 6473) 30.

We can foresee constrained markets for coal, even as consumption pivots away from developed countries to new destinations. Especially for thermal and low-quality coal, we can expect market challenges, and we can expect that the value of assets and resources will decline. These trends and the multiple factors that cause them are already well under way. We can also foresee decarbonization efforts in the upstream industry such as methane drainage and oxidation reduction. Oil and gas may see similar changes. Beyond dispute is that we must retain our full commitment to reducing GHG emissions urgently. The basic truth is that we need to emit less greenhouse gas, much less; and that means that we produce and consume much less coal and oil and gas.

We should not be looking for complicated ways to prevent change in coal and oil and gas activity, and we cannot ask for legal support for a defence of business as usual. Providing some sort of guaranteed market for coal and other fossil fuels would cut right across the need to reduce harm to our climate, and in any event those markets are changing for a number of reasons apart from restrictions on GHG emissions. This analysis has shown that as a matter of general principle there is no sound legal basis for any exception to climate change law for fossil fuel extraction; nor is climate change law qualified by any supervening or overriding right based on rights of development, sustainable development, or permanent sovereignty.

The needs of developing countries have always been central in climate negotiations, in the differentiation of responsibilities and commitments, but we have no duty to make a special case for new mines in developing countries or guaranteed markets for them. Equally, national sustainable development, and development assistance, should not depend on developing the fossil fuel mineral endowment that one country happens to possess but the next country does not. We cannot stave off our obligation to reduce harm to the global climate by giving preferential treatment to fossil fuel development. In fact both developing and developed countries, and the mining companies that operate in them, can direct their energy towards the opportunities that are presented by an emerging low-carbon future and the entirely new pathways that are opening up for social, economic and commercial development.