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Developing country finance in a post-2020 global climate agreement

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A central task for negotiators of the post-2020 global climate agreement is to construct a finance regime that supports low-carbon development in developing economies. As power sector investments between developing countries grow, the climate finance regime should incentivize the decarbonization of these major sources of finance by integrating them as a complement to the commitments of developed nations. The emergence of the Asian Infrastructure Investment Bank, South–South Cooperation Fund and other nascent institutions reveal the fissures that exist in rules and norms surrounding international finance in the power sector. Structuring the climate agreement in Paris to credit qualified finance from the developing world could have several advantages, including: (1) encouraging low-carbon cooperation between developing countries; (2) incentivizing emerging investors to prefer low-carbon investments; and (3) enabling more cost-effective attainment of national and global climate objectives. Failure to coordinate on standards now could hinder low-carbon development in the decades to come.

Since the Durban Conference of the Parties in 2011, the United Nations Framework Convention on Climate Change (UNFCCC) has been preparing for an inclusive post-2020 global climate agreement to be established in December 2015 in Paris[1]. Agreement in December 2014 at the Lima negotiations that all country parties would submit mitigation plans to the UNFCCC, called intended nationally determined contributions (INDCs)[2], demonstrates the intentions of all countries to contribute substantively to reducing global carbon emissions. China's plan to peak CO_2 emissions around or before 2030 and to increase the non-fossil-fuel share of all energy to approximately 20% by 2030 was seen as pivotal to progress in Lima. China's announcement complements its existing domestic commitments to reduce the carbon emissions intensity of gross domestic product growth by 40–45% below 2005 levels by 2020 and to scale a carbon cap-and-trade scheme to the national level by 2017[3].

The promise of climate finance has been critical to encouraging developing country participation in INDCs. The Green Climate Fund (GCF) has been established as the operating entity of the UNFCCC's financial mechanism to assist developing countries in implementing projects, policies and programmes under the convention. The GCF is seen as a pivotal instrument of the emerging set of institutions involving financial flows from domestic public budgets and private finance[4], which constitute the climate finance regime. A regime here can be thought of as the international institutional context where actors can converge in their expectations of shared rules and norms[5], while enhancing information and helping countries achieve their objectives[6,7]. However, while the institutional setting supporting the mitigation regime under development at the UNFCCC has been able to bring the full diversity of developed and developing countries under the same institutional umbrella, the climate finance regime has not done so.

Unrecognized by the UNFCCC is the substantial financial and technological support provided by Chinese firms — generally with policy backing from China's state banks — for power across the developing world: over 300 dam projects in 70 countries[8]; roughly US$22 billion in official energy finance across Africa, ranging from solar energy and biofuel projects to transmission and hydroelectricity[9]; and growing dominance as an equipment export supplier and financier for coal power plants in south and southeast Asia[10]. China has also been an investor in 123 foreign wind and solar power projects over the past decade — mostly in developed countries[11]. China provides more export-credit finance for its international investments than any other country in the world — with power being a key sector[12]. The scale of China's power sector involvement is supported by an independent analysis representative of the geographical spread of Chinese firms operating in the power sector globally (Fig. 1).

The outward involvement of Chinese firms in the power sector has been coal-intensive. Of the power capacity additions involving Chinese firms in Asia outside China, 68% of currently operating capacity and 77% of under-construction capacity is in coal (see Supplementary Table 3). In comparison, only 32% of operating capacity and 54% of under-construction capacity built in Asia without Chinese firms is coal-fired (see Supplementary Table 4). If China's outward investment trend is maintained, coal will dominate its south–south cooperation in the power sector. Three Chinese banks were the largest global financiers of coal mining and power between 2011 and April 2014, accounting for at least US$45 billion[13]. Encouragingly, in September China agreed with the USA to "work towards strictly controlling" public investment in carbon-intensive infrastructure internationally[14]. As China is simultaneously planning to cap its domestic coal consumption[15,16], its coal firms may seek to maintain sectoral growth by focusing internationally, following the experience over the past decade of other Chinese infrastructure firms facing a saturated and competitive domestic market[11,17]. Structuring incentives for clean energy finance at the multilateral level — in addition to bilateral commitments — will help China and other emerging infrastructure investors to more easily rein in carbon-intensive power sector investment abroad.

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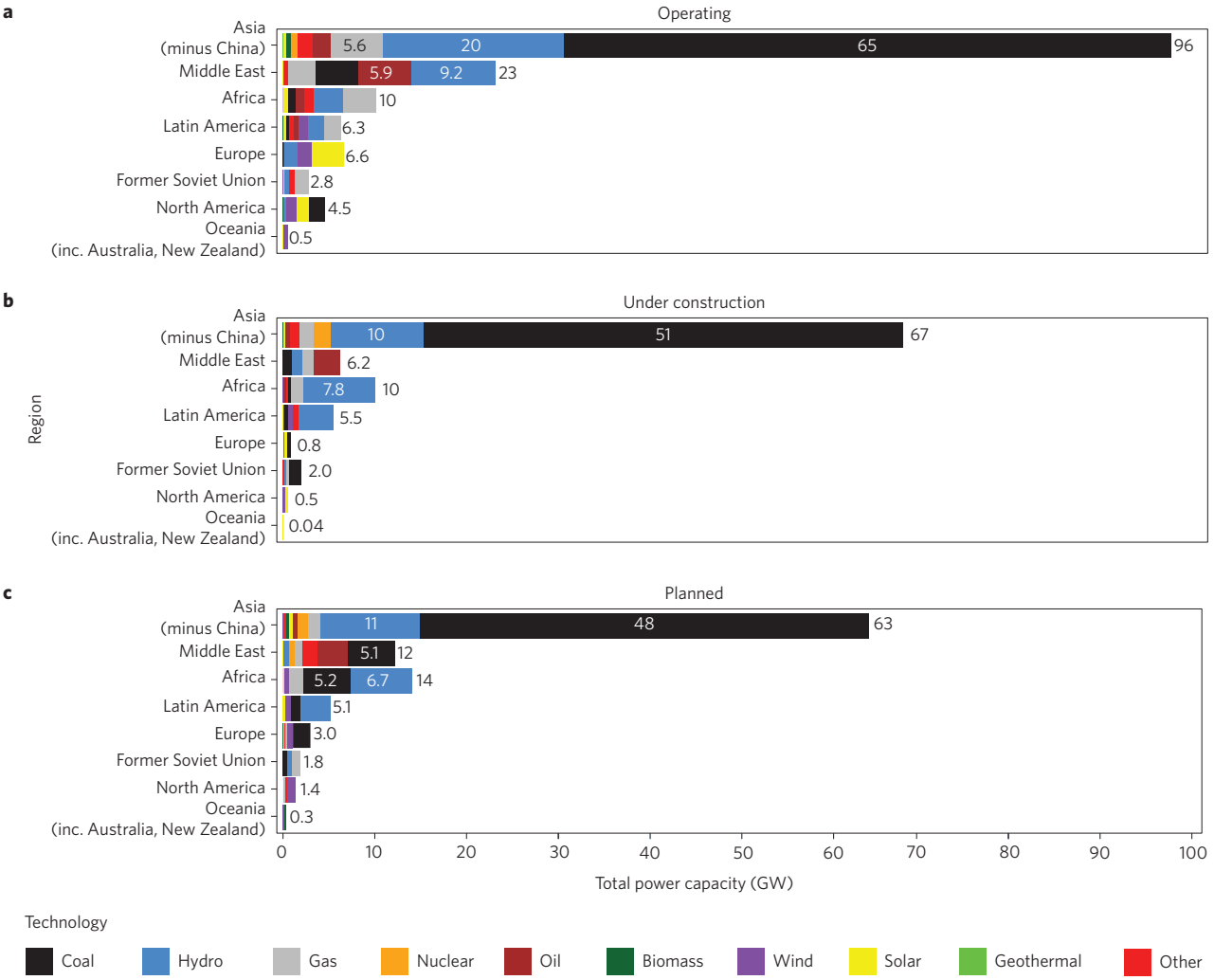

Figure 1 | Power capacity outside China, involving Chinese firms. a–c, Cumulative capacity of power projects outside China that are operating (**a**), under construction (**b**) and planned (**c**) involving Chinese companies in either architecture/engineering, construction or the supply of generators, turbines and steam systems (boiler or reactor). Owing to missing company data, presented capacities are a lower bound. The data are representative for all technologies and regions except for supply of solar technology, which is likely to be substantially larger than shown in the figure (see Supplementary Tables 1 and 2).

Failure to decarbonize global power sector investments could contribute to the long-term lock-in of fossil infrastructure[18,19]. Investment flows for fossil power plants without carbon capture and storage must be decreased significantly in both Organisation for Economic Co-operation and Development (OECD) and non-OECD countries to stabilize atmospheric CO_2 concentrations at levels that keep temperature rise in the range of 2 °C[20,21].

The global climate agreement should be structured so there are incentives for all countries, including China and other emerging players, to shift international investments to low-carbon power from coal. Negotiations are not moving in this direction. In Lima, China chose not to provide climate finance through the GCF and instead announced the creation of its own market-based South–South Cooperation Fund outside the purview of the UN climate agreement that will double China's financial contribution to developing countries for addressing climate change. While the concept of a south–south climate fund is laudable, it is representative of further fragmentation in the institutions affecting the climate finance regime. Two sets of countries are shaping two sets of rules. This lack of coordination could hinder efforts to make the transition to lower-carbon power sector finance. We are not questioning the historical and practical motivations for China to create institutions with independent rules[22,23]. But we believe that for climate finance to best achieve its goals, negotiators should choose a forum — preferably the UNFCCC — for negotiating rules on climate finance and then structure incentives for countries to migrate their international finance in the power sector to lower-carbon sources.

Developing country cooperation

The south–south climate fund is part of an emerging institutional architecture created to support cooperation between developing countries. During the summer of 2014, after years of discussion, the New Development Bank comprising Brazil, Russia, India, China and South Africa (BRICS) was created with the purpose of "mobilizing resources for infrastructure and sustainable development projects in BRICS and other emerging and developing economies"[24]. The New Development Bank — headquartered in Shanghai — has authorized starting capital of US$100 billion[24]. The nascent Asian Infrastructure Investment Bank is also championed by China with broad multilateral support (minus the USA and Japan) and is likely to become a premier infrastructure financier in Asia with starting capital of US$50 billion[25]. China's US$40 billion Silk Road Fund will also support infrastructure investment in neighbouring countries[26].

In comparison, the UNFCCC's Green Climate Fund has reached initial capitalization of US$10 billion, and the new South–South Cooperation Fund will be a fraction of the size of these new

institutions[27,28]. Financial flows to support climate goals could be marginalized relative to international finance in power infrastructure that falls outside the bounds of climate finance. It remains unclear how the institutions of the new south–south architecture will interact and how they will integrate with the existing order of global institutions. Chinese officials have argued that the new international financial institutions will supplement, rather than compete with, the existing array of institutions[29,30]. But while some environmental groups and governments are applying pressure to the existing international financial institutions to reduce carbon-intensive north–south investments[31,32], there is no indication that the new predominantly south–south focused institutions will simultaneously embrace a transition towards less carbon-intensive project portfolios.

Moreover, there is no assurance that north–south financiers will not return to investing in coal power, particularly if competitor institutions continue to make large profits from coal financing[33]. Competing rules and norms among the institutions financing power sector development may inhibit the scale-up of low-carbon energy.

In a similar case, failure to coordinate early has led to a serious challenge for the export-credit finance regime. OECD guidelines regarding export subsidies and the tying of highly concessional finance to commercial contracts were negotiated in 1978 and periodically updated to create a transparent process and level playing field for OECD export competition. As China and other non-OECD members were initially excluded from the negotiations, they repudiate the rules today[34]. Finance from China and the other BRICS is the biggest single challenge to continued operation of the OECD rules[35]. The International Working Group on Export Credits announced in 2012[36] and other bilateral and multilateral negotiations outside the OECD are making halting progress on an agreement involving China, with hopes of preventing a race-to-the-bottom, wherein participants in the OECD arrangement lapse in their own export-finance standards to compete with China[37,38]. Giving all essential parties a stake in development of the climate finance regime may require greater early flexibility in how the regime operates, though there would need to be provisions to tighten standards over time. Drawing on the OECD export-finance experience, starting with an inclusive process for the climate finance regime would increase the resilience and effectiveness of norms and rules in the long term.

Lessons from previous negotiations teach us that failure to adopt flexible structures in the face of major trends can be deleterious to long-term climate action. The legal division created by the 1995 Berlin Mandate[39] that exempted emerging economies from mitigation responsibilities is widely seen — in developed countries at least — as having delayed meaningful global action and was one factor preventing ratification of the Kyoto Protocol by the USA[40]. A forward-looking climate finance regime would create a structure for global power finance that would encourage and reward investment in the low-carbon economy and be inclusive of developing countries to maximize available resources for low-carbon transitions around the world.

UNFCCC integration

China's investments are generally private capital leveraged by state banks, with both market and political motivations. This finance structure is not fundamentally different from north–south finance; negotiators at the 2011 Conference of the Parties in Durban have already recognized the role that public climate finance can play in leveraging the private sector. Export finance can qualify broadly for use as climate finance[41] and is commonly used by the USA, Japan, Germany and others. Thirty-seven percent of the US contribution to the UNFCCC's fast-start finance — resources approaching US$30 billion pledged by developed countries for mitigation and adaptation in developing countries for the period 2010–2012 — came from the US Export-Import Bank and the Overseas Private Investment Corporation[42]. These two US government financial institutions, functionally similar to Chinese state banks but bound by more stringent rules, support US export contracts to international markets by insuring against commercial and political credit risk.

Governance of global finance, including export credits, foreign direct investments and trade subsidies, involves an array of overlapping institutions, forming a regime complex[43]. However, the institutions and forums that make up the existing regime, such as the OECD, the International Working Group on Export Credits, the World Trade Organization and the International Monetary Fund, G-7 and G-10, are dominated by a subset of countries that have not historically represented the interests of developing countries[44]. Considering the growing importance of emerging markets and the tension between development goals and climate policy, the UNFCCC may therefore be a productive forum to encourage decarbonization of power sector finance until a more robust global finance regime develops.

The UNFCCC has a solid foundation as a setting to negotiate consistent standards around north–south and south–south climate finance. Most discussion of mitigation efforts and mitigation financing has understandably focused on the north. But the UNFCCC's 2007 Bali Action Plan and 2010 Cancun Agreements each called for institutionalized inclusion of south–south cooperation in the climate change mitigation and adaptation regimes, and any countries "in a position to do so" should be supported in enhancing technology transfer and capacity building[45,46]. These political proclamations in support of south–south cooperation at the UNFCCC echo parallel but independent south–south promotion within the World Bank, UN Development Programme, UN Environment Programme, Center for Biological Diversity and elsewhere, but had dropped off the map in the UNFCCC until China's announcement in Lima. The Paris conference thus represents an opportunity to refocus and assess the potential for the UNFCCC to incentivize decarbonization of international power finance from all sources.

Discussions of what constitutes climate-friendly finance are already underway at a number of multilateral development banks and the International Development Bank Club, which includes the China Development Bank[47,48]. An inclusive UNFCCC process should multilateralize this task, because having an internationally agreed definition of what qualifies as climate finance is a precondition for monitoring changes in investment portfolios. Next, the UNFCCC should leverage its role as the coordinator of international mitigation efforts to restructure incentives around international finance to encourage less carbon-intensive power projects. We introduce a mechanism for achieving this below.

The international community should recognize, encourage and integrate finance that is consistent with the goals of the convention, regardless of origin. One option is to allow countries to include low-carbon cooperation towards their INDCs, giving countries such as China recognition for decarbonizing international investment portfolios below their current baseline. Countries could cooperate on attainment of an INDC, sharing credit for a project with the country that provided its finance. Thus, international infrastructure finance in the power sector that meets the UNFCCC-agreed definitions of climate finance could be added to a country's INDC. Any such scheme would need to implement safeguards to prevent double counting and to ensure measurability of reductions.

In practice, developing and developed countries could offer carbon-intensity-based targets in their INDCs evaluated on the basis of all power sector projects, regardless of their location, that are financed by persons or entities domiciled in the nation.

Both China and the international community have much to gain. China and other emerging players could prove themselves 'norm-makers' by inclusively developing common definitions of climate finance for its new set of international financial institutions, and then by setting targets for a transition to cleaner energy both domestically

and internationally. China has argued that the new institutional architecture supporting south–south cooperation will be "efficient and green"[49]. Our proposed mechanism would allow China to show the world it is serious about this commitment, while also getting credit for implementing INDCs that include low-carbon international finance. Smaller developing countries would also be enticed to share expertise in areas of domestic comparative advantages, accelerating low-carbon development. Many developed countries currently oppose including finance in INDCs, but participation would be voluntary. If developing countries began making contributions to a voluntary scheme, there could be normative pressure for developed nations to scale-up their own contributions.

Recognizing south–south cooperation in INDCs opens opportunities to capitalize on efficiencies associated with broader market access and technological exchange[50]. The Kyoto Protocol offered flexible mechanisms to assist developed countries in achieving domestic emissions targets through international market-based approaches. If similar tools are to be preserved in the post-2020 UN climate agreement and can be made sufficiently rigorous in crediting emission reductions, they should be extended to south–south relationships. Many Chinese projects are not very different from schemes that have been awarded clean development mechanism credits, including in hydropower and supercritical coal, although the need for deliberations to determine whether such credits qualify for the post-2020 agreement is an important justification for coordinating on climate finance definitions. Other crediting issues with market and non-market emissions mechanisms are being actively debated by the UNFCCC[51–56].

A programme allowing countries to receive — subject to established methodologies — credits towards mitigation goals for international investments could give them room for enlarging their global carbon mitigation footprints[57], while also reining in some of the leakage that arises from uncoordinated climate policies, including relocation of carbon-intensive industry[58,59] and transfer of carbon embodied in traded goods[60–63]. Quantifying both finance and mitigation contributions under the UNFCCC also opens the opportunity for international linkages through carbon markets, which further enhances the efficiency of mitigation[50,64].

Recognizing south–south contributions could be unwelcome if viewed as an effort to weaken the responsibilities of developed country parties. Bringing south–south financiers into a regime for international finance in the power sector should be voluntary, additional and complementary to the responsibilities of developed country parties, as recognized in articles 4.3–4.5 of the UNFCCC's 1992 founding text and implicit in the commitment by developed countries to mobilize US$100 billion in climate finance annually by 2020.

The opportunity to leverage greater south–south cooperation in clean energy is worth the coordination costs involved with considering and implementing this proposal. Chinese annual domestic installed capacity of both hydropower and non-hydro renewables was the largest in the world in 2013[65] and China's large capital account surplus gives it the opportunity to push this expertise beyond its borders with international investments[66]; India's ambitious 100 GW solar and 60 GW wind targets for 2022 could stimulate domestic industry that spills abroad[67,68]; Mauritius has become a hub for knowledge on combined heat and power for biomass[69]; and Brazil is an international purveyor of expertise in biofuels[70]. One could imagine the Chinese state-associated banks, Asian Infrastructure Investment Bank and the New Development Bank in a race to become the largest global financiers of wind and solar power in the global south and beyond, instead of supporting the expansion of global coal fleets.

Path forward

Negotiators at the Paris conference should continue to encourage south–south cooperation on low-carbon and climate-resilient development, while acknowledging that the majority of China's recent south–south investments in the power sector have been in coal. The international community should engage with China and other emerging donors to structure a system for the transition of international infrastructure finance in the power sector towards lower-carbon alternatives. If the experience of the OECD export-finance guidelines and Berlin Mandate are any guide, a non-inclusive approach to the climate finance regime could hinder adherence to standards and weaken appetite for stronger rules. Instead, negotiators should encourage use of the UNFCCC to create common definitions and to structure incentives for both emerging and existing institutions to shift finance to low-carbon power. Such a scheme could involve a transparent set of guidelines allowing countries to count particular low-carbon international investments towards their contribution to global mitigation. The BRICS should, in our view, take leadership of this initiative at Paris, both to strengthen their involvement in transfer of low-carbon knowledge in areas of domestic advantage and — if permitted — to count finance as part of a country's INDC, allowing them to broaden the scope of their contributions to a low-carbon economy around the world. Encouraging lower-carbon south–south flows could be a game changer for both sustainable development and global efforts to slow climate change.

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Author contributions

P.M.H. conceived the project in consultation with Z.L.; P.M.H. conducted the analyses and wrote the paper; M.O., S.J.D. and Z.L. provided substantial intellectual content in framing the argument and editing; Z.L. and M.O. jointly advised the work.

Additional information

Supplementary information is available in the online version of the paper. Reprints and permissions information is available online at www.nature.com/reprints. Correspondence should be addressed to P.M.H. and Z.L.

Competing financial interests

M.O. is a consultant/science advisor to the Environmental Defense Fund.