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Greening or Greenwashing?

Decarbonization Promises Along the BRI & CPEC

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Introduction

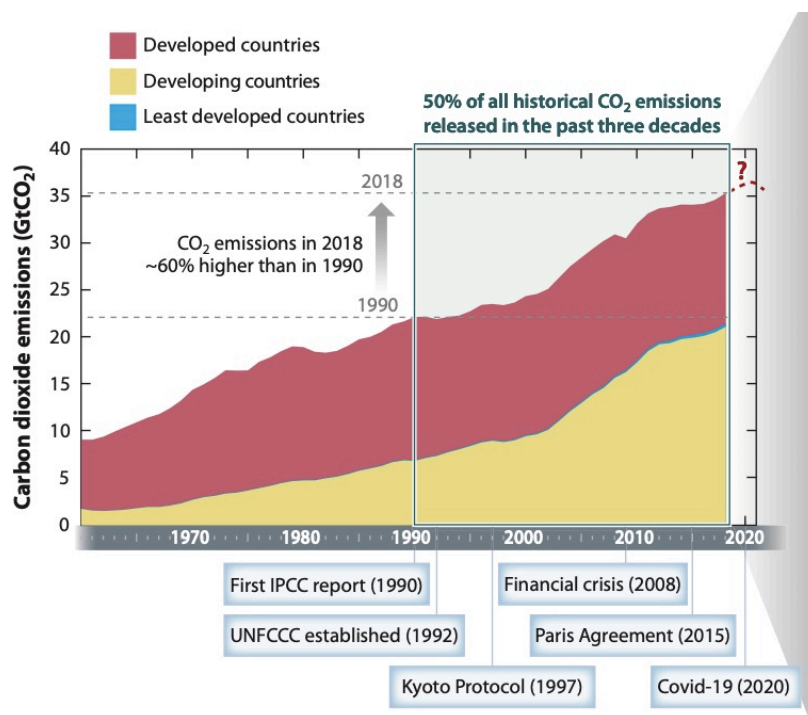
Capitalism and its corollaries – market liberalization, privatization, mass production and consumerism – have shown their merits as a system of organizing economic activity, creating unprecedented levels of wealth for nations adopting it and paving the way for innovation in medicine, technology, mobility and more that would have been unthinkable a few generations ago. The globalization of capitalism that has accelerated over the course of the 20th century facilitated the fast-paced industrialization and economic growth in States first in the global North, but after the second World War increasingly also in the global South. However, as capitalism expands and economic activity worldwide explodes, so do its ecological effects; evidence is mounting that the large-scale extraction of value from nature for the sake of profit creation has brought ecological systems worldwide under stress that might lead to irreversible damage, possibly denying future generations the opportunity to live the prosperous lives that neoliberal modernization theory had promised.

The mass extinction of species due to excessive human interference with ecosystems, air and water pollution due to industrial activity and soil degradation as a result of excessive and unsustainable agricultural practices are some examples of anthropogenically-induced ecological damage, impacting human health and livelihoods but especially affecting poorer countries and people who lack the means to protect themselves, and thus contribute to increasing inequality within and across nations (OECD 2021). Yet, probably none of these crises pose as complex a challenge as the specter of climate change. Its causes (carbon concentration in the atmosphere, at least in part due to greenhouse gas (GHG) emissions resulting from increasing economic activity since the industrial revolution) are temporally and spatially not visibly connected to its effects (the warming of the planet and the increase of weather extremes): the progressive concentration of GHG emissions in the atmosphere is a *global* problem irrespective of the country and sector releasing it (EEA2018). This means that it requires the entire global community to collaborate in order to mitigate climate change, the framework for which is provided by the 2015 Paris Agreement, a near-universally ratified instrument that has set the goal of containing average global warming at “*well below 2 degrees above pre-industrial levels*” (UNFCCC, 2015).

What sets the Paris Agreement apart from traditional international agreements is its methodology: Rather than prescribing concrete measures, the Paris Agreement allows States to define their own emissions reduction targets through the so-called Nationally Declared Contributions (NDCs). By thus handing the responsibility to define their own decarbonization trajectories back to State parties, the Paris Agreement accommodates the uneven distribution of responsibility for climate change: After all, developed countries have fueled their industrialization through coal, oil and gas, and still contemporarily, the category of Least Developed Countries (LDCs)’ emissions per capita are about 40 times lower than those of developed ones (although these patterns are shifting – more about this later) (Stoddard et al, 2021). This moral hazard is known under the term ‘climate justice’, and is explicitly recognized

in the Paris Agreement, which concedes that “*economic and social development and poverty reduction are the first and overriding priorities*” of developing countries (UNFCCC, 2015).

However, despite the Paris Agreement doubtlessly being a success in the sense that it brought States all across the globe to the negotiation table, data demonstrates that the world is failing abysmally in actually achieving the Paris goal. Graphic I visualizes this; while developing countries’ emissions have been on a more or less consistently high level since 1990 (the year when climate change mitigation entered the global agenda with the publishing of the first climate report by the International Panel for Climate Change), emissions by developing countries have been increasing rapidly, with no indicator in sight of a reversal of this upward trend by either developing or developed countries (Stoddard et al, 2021). A reason for the lack of progress may be that the Paris Agreement’s success may be founded on a flawed assumption that, perhaps because it is so fundamental to the survival of global capitalism, it is not questioned as much as it perhaps should be; Can nations achieve economic goals by which we measure well-being and progress of a nation – industrialization, modernization, GDP growth - at all - without emissions increasing? This assumption, known as ‘green growth’ theory or narrative, has from the onset been ill-defined and is poorly evidenced by historical precedence – all developed nations, without exception, have grown wealthy on the back of massive GHG emissions – however, its alluring ‘win-win’ rhetoric and techno-optimism have been embraced by many of those in positions of power (Anderson, 2016).



Graphic I: Global Carbon Dioxide Emissions - Source: Stoddard et al (2021)

In a nutshell, green growth narratives are founded on the idea that economic expansion (as measured by GDP) can be made compatible with the planet’s ecology – in green growth lingo, economic growth can be ‘decoupled’ from ecological degradation - through technological advancements and adequate government policy, and consequently, that adequately managed ‘green economies’ are, in principle, able to grow indefinitely as ecological limits to growth such as resource scarcity and climate change-related disruptions are removed

(Hickel & Kallis 2019). This ecology-economy win-win rhetoric is highlighted, for instance, by Hausman who, writing for a ‘green growth’ strategic handbook published by the IMF, asserts that “*the question is not what you can do to reduce your country’s emissions but how you can supercharge your country’s development by breaking into fast-growing industries that will help the world reduce its emissions and reach net zero*” (Hausman, 2022). Yet despite of the term now being used routinely in strategic guidance documents by institutions such as the OECD and the World Bank and having been legitimized through the introduction of international institutions such as the Green Growth Institute and the Green Growth Knowledge Platform tasked with advancing green growth strategy around the world (Hickel & Kallis, 2019), the actual *substance* of these terms both as a theory and a strategy, and what can be achieved through them, is far from obvious: Do they constitute transformative narratives that have the potential to motivate action, as argued, for example by Hinkel et al. (2020), or simply a ‘rescue operation for a capitalist political economy’, a discursive strategy by which the agents of capitalism attempt to legitimize an inherently destructive system that works to their advantage, as suspected, for example, by advocates of the political ecology school and proponents of ‘post-growth’ or ‘de-growth’ theories (e.g. Harlan, 2020, Dryzek 2017)? Besides resting on shaky theoretical and empirical foundations, the lack of a unified conceptualization of ‘green growth’ in terms of the measures qualifying as ‘green’ ones as well as its goals – simply a more energy efficient economy, or one that aligns with the goals of the Paris Agreement, or a complete decarbonization of the global economy? – clearly leaves ample leeway for those with a vested interest in preserving the status quo to ‘greenwash’ energy and climate policies, that is, to advertise profit-generating activities as ‘green strategies’ when, in reality, they only represent minimal tweaks to business-as-usual scenarios.

China’s ‘Ecological Civilization’: A Utopia for whom?

China is among those countries that has benefitted vastly from the first cautious but then sweeping introduction of a capitalist-type model of economic organization – “*capitalism with Chinese characteristics*” - through partial privatization of industry, the introduction of market mechanisms to govern resource allocation and the incremental opening up to foreign trade and investment. The fast-paced industrialization resulting from China’s economic reforms have since lifted millions out of poverty, created a wealthy, educated middle class and consolidated internationally competitive industries, however, China’s fossil fuel-based growth has also come at a heavy ecological cost in terms of pollution, land degradation and the global climate. China has tripled its CO₂ emissions since 2000 and today is the single largest emitter of GHGs by a significant margin, with emissions projected to continue rising, in line with China’s self-declared goal, until 2030 (Heggelund, 2021). However, the Chinese government, the Chinese Communist Party (CCP), could hardly allow itself to backtrack from its growth-centered development paradigm: Deriving much of its legitimacy from its astounding economic performance over the past 4 decades, its survival on the long run may hinge upon its ability to continue credibly presenting itself as provider of prosperity to its people. The logic underpinning ‘green growth’, with its implied synergy between economic growth and ecological protection, provided the discourse by which China could, at least rhetorically, pursue both ecological and economic objectives simultaneously. The Chinese version of the green growth narrative centers around the notion of a hypothetical ‘Ecological Civilization’ – “*a new kind of Community Party led utopia wherein market economy and consumption continue to*

grow, and technology and science have resolved the challenges of ecological damage” (Hansen et al, 2018) - the construction of which was enshrined in the CCP’s Constitution 2012. While rhetoric surrounding the notion is made palatable to the public through poetic metaphors – “*green mountains and clear water are as good as mountains of gold and silver*” (CPM 2021) - the proposed means to get there are, in line with the typical ‘green growth’ logic, highly technocentric with much optimism placed in innovation and development of renewable energy and energy-efficiency technologies as well as the expansion of ‘green’ financial markets (Huang, 2021). To be sure, this is not mere empty talk; China has taken notable steps to corroborate words with action. The nation has established itself as the largest manufacturer and exporter of various clean technologies such as solar panels, wind turbines, electric car batteries and carbon capture and storage technologies, is a key issuer of ‘green’ financial measures such as green bonds and securities, and has put in place progressive environmental policies as well as ambitious climate targets, such as the goals to achieve peak emissions by 2030 and climate neutrality by 2060.

However, China’s efforts to realize its utopian ‘Ecological Civilization’ seems to stop at its own borders; recent critique has been voiced at China’s approach towards energy and environment in the context of its massive infrastructure development program, the Belt and Road Initiative (BRI), a multi-billion dollar undertaking aiming to develop industrial, transport and energy infrastructure of countries around the world but with a pronounced focus on lower income countries. In contrast to its domestic approach to energy investment, a majority of BRI projects involve heavily polluting and environmentally harmful activities, especially with regard to power generation – so much so that outcries that the BRI may be bound to become the “*riskiest environmental project in history*” (Vidal, 2022) have gained currency. Let us take a closer look at the evolution of the BRI, especially in terms of energy-related decision-making, since its announcement in 2013.

China & the BRI

In 2013, Chinese President Xi Jinping announced to the world his plans to revive the Silk Road, an ancient trade route that around the time when the Roman Empire was at its height had served as a corridor for commerce between Asia and Europe. The “new” Silk Road, now rebranded as the Belt and Road Initiative (BRI), is notoriously difficult to define – a task that has been compared to ‘nailing jelly to a wall’ due to the BRI’s evolving geographical and conceptual scope and the intransparency in China’s bilateral contractual arrangements with BRI countries (Schulhof et al, 2022) – but for the purposes of this Paper it suffices to note that the BRI is the single-largest infrastructure development project in human history, a multi-billion undertaking by which China aims to integrate its own economy with those of some 146 partner countries (‘BRI countries’).

With respect to its geographical distribution, BRI investments are concentrated predominantly in East Asia, followed by West Asia, the Middle East and Sub-Saharan Africa, with a smaller share being channeled towards Europe (especially the Balkans) and South America. The scope and sectoral focus of the BRI differs widely across BRI countries; overall, key sectors benefiting from BRI funding are the transport sector, the energy sector, real estate and mining industries. Because China frames the BRI as an undertaking aiming to, among other things, assist low-income countries in achieving growth and prosperity, the BRI has sometimes also been described as a Chinese “*Marshall Plan*”. The concrete intention underpinning

China's ambitions, however, are somewhat of a topic of debate; China fashions the BRI in the language of 'mutual benefits' and 'shared development' with the officially stated goals of the BRI promoting "*the orderly and free flow of economic factors, highly efficient allocation of resources and deep integration of markets by enhancing the connectivity of the Asian, European and African continents and their adjacent seas*" (Xinhua, 2015) however, commentators suggest that there might be other, less explicit rationales underpinning the conception of the BRI, such as China's need for outlets for its surplus capacity and its ambitions to establish itself as a leader on the global stage (Gallagher & Qi, 2021). Other commentators suspect ill intent, for example that China purposefully burdens developing countries with unsustainable debt so as to make them politically subservient, a theory that has become known as the '*debt trap*' debate (see e.g. Tharoor, 2022).

While eyed with suspicion by Western observers across the US and EU, the governments of many lower-income BRI countries eagerly welcomed China's plans as an opportunity to finance the closing of their infrastructure gap and set them off onto a path of economic modernization and social development. While it is not the purpose of this essay to evaluate whether such expectations can and will materialize, anecdotal evidence from various BRI countries whose BRI development is already well underway shows that the grand visions of governments do not always align with the reality of people 'on the ground'; indeed, fiscal, environmental and social problems associated with various BRI projects have considerably reduced popular support of Chinese investment along the BRI since its inception (Garcia-Herrero & Freymann, 2022). In the civil-war raged Myanmar, for example, Chinese investment into hydropower development has been met with fierce opposition by local communities; the infamous, now shelved Myitsone dam in particular, built in an ecologically sensitive region inhabited by ethnic minority groups, has been the cause of intense confrontations between local people and the government due to the ecological damage, destruction of cultural heritage and forced displacement of over 15,000 people that would result from the flooding of an area as large as 766 square kilometers if the project was to be completed (Ramachandran, 2019). In Bangladesh, the Banshkhali Coal Power Plant has evoked anger of locals due to rampant on-site human rights abuses including a fatal neglect of labor rights and safety as well as the forced eviction of thousands of locals (The Daily Star, 2021). Another often-cited example of BRI collaboration gone sour is Sri Lanka, where the debt crisis that resulted in the eventual collapse of the government which was partially due to high-interest loans owed to Chinese banks (Moramudali & Panduwawala, 2022). Irrespective of whether this is the result of a deliberate strategy by the Chinese to gain political leverage over debtors – the '*debt trap*' debate referred to earlier – or simply the result of reckless lending practices that fail to adequately assess local conditions and investment risks, as argued, for example, by Michael Pettis from Carnegie Endowment (Pettis, 2022), the fact that nearly 60% of China's overseas loans are held by countries considered to be in financial distress elicits concerns that other countries might soon follow into Sri Lanka's footsteps (ibid).

These locally specific issues aside, another concern that is increasingly putting the BRI in the spotlight of international criticism is its potential climate effect. To be sure, the BRI was not meant to serve the planet's ecology and infrastructural development, especially on the scale of the BRI, as well as the increased economic activity resulting from it will inevitably have environmental and climate implications (Uniyal, 2021). The Paris Agreement acknowledges that developing countries may prioritize poverty eradication and socio-

economic development over climate considerations (UNFCCC, 2015) – however, what *does* provide a legitimate reason for concern are the *types* of investments making up the BRI portfolio, especially with respect to power generation: 77% of China’s overseas energy investments are fossil fuel – based, in comparison with a meagre 3% channeled toward solar and wind, and 17% to hydro (Gallagher & Qi, 2021). The relevance of this ‘dirty’ approach towards energy cannot be overstated as investment in coal, oil or gas not simply lead to momentary emissions growth but may trap developing countries with exponentially rising energy demand in carbon-intensive development trajectories resulting from the long-lived nature of infrastructural assets, and it will be difficult, and most of all forbiddingly costly, to decarbonize an economy once agreements with financial institutions and contractors enter into force and construction of carbon-intensive infrastructure is in progress. Therefore, as warned by the Yale Environmental School, the *“Belt and Road Initiative threatens to lock China’s partners into the high-emissions development that China is trying to exit”* (Hilton, 2019).

Indeed, while the world’s focus has rightly been on today’s major emitting countries when it comes to fighting the battle with climate change, the biggest climate risks in the future lie with developing countries poised to become major CO₂ emitters within the coming decades as their population size grows and their pace of industrialization accelerates (Jun & Sadek 2019). While keeping in mind that emissions forecasts should be regarded as little more than informed guesses, it is worth pointing at a report by Tsinghua University and partners (2022), which finds that if 126 key BRI countries that today are responsible for only 26% of global GHG emissions, could if they continue on the emissions track they currently appear to be set for (‘Business as usual’ scenario), by 2050 be responsible for 66% which would make the 2 degree goal of the Paris agreement impossible to achieve, thereby potentially *“tipping the world into catastrophic climate change”* (Hilton, 2019). The contrast between China’s relatively progressive energy and environmental policy at home and that applied to its overseas investments begs questions as to the genuineness of China’s language of *“mutual benefits”* and *“shared development”* by which the BRI is communicated, and even raises suspicions that China is purposefully moving its fossil fuel-based economy and high-emissions industries abroad so as to be able to simultaneously meet its growing energy demand and its domestic environmental and climate targets. The ORF, for example, claims that *“instead of liquidating its coal sector assets as part of its green transition, China has instead transferred its old, dirty, least efficient coal technologies to the BRI nations”* (D’Souza, 2021).

Be this as it may, in order to diffuse accusations over mounting evidence of the BRI’s negative social and ecological impacts, President Xi declared his intent to pursue a new, green approach to the BRI, one that is committed to ‘green infrastructure, green energy and green finance’ (Uniyal, 2021). Putting words into action, the Chinese government has since 2017 adopted an impressive set of ever-more concrete guidelines and recommendations for Chinese financial institutions and contracting firms involved in BRI with the stated goal of *“share[ing] the ecological civilization philosophy”* (MEE 2017). The *Green Investment Principles (GIP)* for the Belt and Road, for example, recommend that stakeholders to BRI projects shall improve environmental and climate information disclosure, conduct environmental risk assessments and embed sustainability into their corporate strategies and organizational cultures, and the *Green Development Guidance* outlines a so-called Traffick Light System, which would identify ‘red’, ‘yellow’ and ‘green’ projects, that is, environmentally harmful, neutral or beneficial projects (Uniyal, 2021). China has furthermore

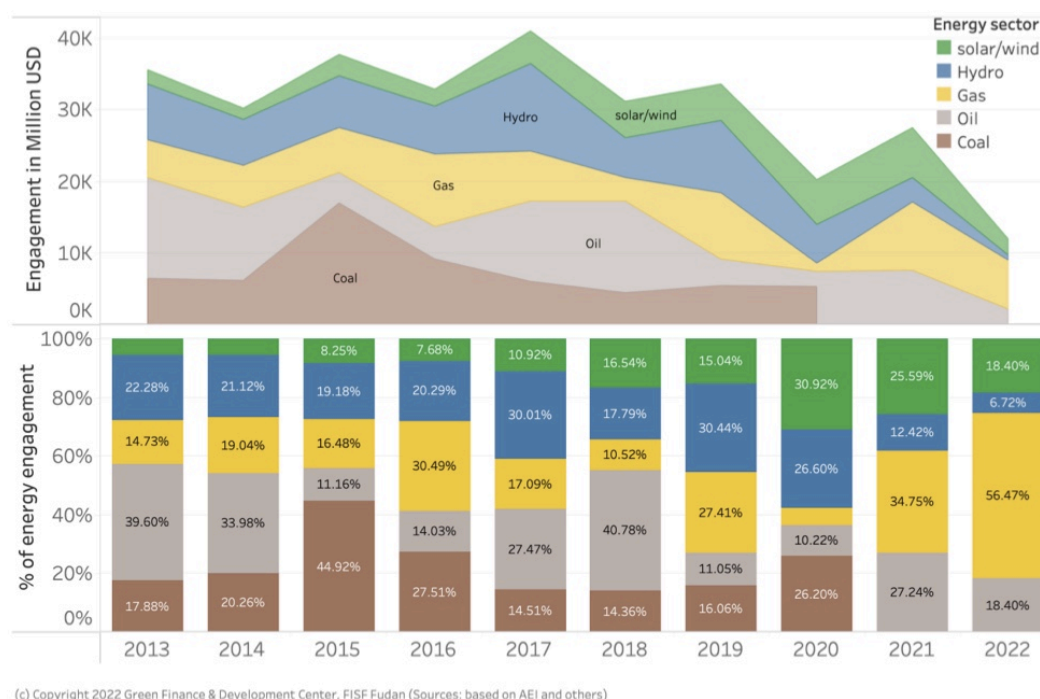
set up cooperation and information sharing platforms and committees to raise awareness and facilitate the dissemination of ‘green’ skills and technologies, such as the Belt and Road International Forum which convened in 2017, 2019 and 2021, and the BRI International Green Development Coalition (BRIGC), set up in 2019 and tasked with disseminating best ‘green’ practices and facilitate exchange and transfer of green technologies (Wang et al, 2022). Another development was President Xi’s announcement in 2021 that China would “*step up support for developing countries in developing green and low-carbon energy and not build new coal-fired power project abroad*” (China Daily, 2021), which was followed by the suspension of a total of 15 planned coal-based power generation projects that would have produced around 12.8 GW of electricity projects (Suarez, 2022).

Yet, what is equally important to what has been said and done is what has *not* been said or done. Virtually none of the documents related to ‘greening’ the BRI have any legally enforceable character, and reports demonstrate that the only legally binding obligation BRI project developers are required to observe – namely adherence to local environmental regulations – is, despite of anyways low environmental standards in most BRI countries, all too often neglected (FOE, 2017). The same is true for routine procedures to limit social and environmental harm that, in line with international standards, ought to be conducted in the planning phase of infrastructure project development, such as environmental impact assessments (EIAs), feasibility studies and consultations with stakeholders including local communities (ibid). With respect to investment in energy generation technology, the graphic below does provide evidence for a modest increase in investment in renewables and a decrease in coal-based engagements along the BRI, although research points to the fact that BRI investments in renewable power generation projects are concentrated in developed rather than developing BRI countries (Harlan, 2021).

Starting in 2021, skyrocketing energy prices and energy supply shortages as a result of the post-COVID economic rebound and Russia-Ukraine war squeezed the global economy, disrupted energy supply lines and firmly put energy security back on top of national and global agendas. In line with green growth logic, this should not disrupt the global clean energy transition but rather hasten it; after all, electricity generation from renewables is already cheaper even than coal, and bound to decrease further, and the non-locality of renewable energy sources – wind, water, sun – has potential to help States become energy self-sufficient, hence relieving them of their reliance on unreliable and costly energy imports. The Director of the International Energy Agency (IEA), Fatih Birol, in this vein, argued that because the tremors of the crisis were mainly felt in fossil fuel markets, the crisis may eventually prove a ‘historic turning point toward cleaner and more secure energy futures’ (IEA, 2022) as States acknowledge that long-term energy security cannot be achieved through reliance on fossil fuels. In reality, however, data demonstrates that while the energy crisis has indeed led to moderately accelerating investment in renewables in the developed world, the same is not true for developing countries, whose clean energy investments have, overall, stagnated or decreased relative to investment in fossil fuels in the wake of the energy crisis (IEA, 2022). Rather than accelerating ‘green growth’, in seeking out cost-effective and reliable options to diversify their energy mix, coal, the dirtiest of power-generation technologies, made an impressive comeback, with the result that global power generation from coal jumped by a massive 9% in 2021 after priorly having consistently declined (IEA, 2021). China was among those who opted to revive coal, re-introducing a series of regulations and financial incentives for the coal mining

and power sectors and approving at least 15GW worth of new coal generation capacity in 2022 (Reuters, 2022). The crises around 2020 also affected energy generation along the BRI and in 2022, BRI investment in coal was quietly resumed in contradiction to Xi’s promise to phase out coal (Wang, 2023).

Of these above paragraphs, two things shall be kept in mind with respect to our initial discussion around ‘green growth’. First, while China has, on paper, been highly active in BRI ‘greening’ through the publication of policy documents and the creation of institutions, on-the-ground activity does not reflect discursive activity; rather, rhetoric around the ‘green’ BRI appears more like a public stunt to shelter the BRI from criticism. Without adequate action to follow words, the BRI may perhaps be greenwashed but certainly not ‘greened’ in any sense meaningful for the future of the planet. Second – and more fundamentally to green growth theory – it appears that energy security and the clean energy transition are, in practice, not as neatly reconcilable as green growth narratives suggest. This statement appears to be true for developing countries in particular; otherwise, the energy crisis would have given momentum to the global clean energy transition. Hence, there seem to be variables at play that alter the equation underlying ‘green growth’ logic. What are these variables? And what is China’s role, as a key investor, in determining the success (or failure) at ‘green growth’ of its BRI partners? Let us take a look at a highly relevant case – Pakistan.



Graphic II: Chinese Energy Engagement 2013-2022 Source: Wang, Green Finance & Development Center, 2023

Pakistan’s Dilemma and CPEC

Pakistan and its section of the BRI, termed the China-Pakistan Economic Corridor (CPEC), is a particularly interesting case for assessing the possibilities and challenges, as well as the discrepancy between word and action, of BRI ‘greening’. Pakistan is a key partner in the BRI

and has been one of the first countries to sign Memoranda of Understanding with China, invoking, in typical BRI lingo, the ‘close friendship’ between the countries and the ‘mutual benefits’ that CPEC would yield (Ministry of Planning, Development & Special Initiatives [henceforth MPD], 2022). For China, CPEC’s value is predominantly geostrategic: It not only provides China with direct access to the Arabian Sea, thus allowing it to bypass the politically sensitive Strait of Malacca as a route for oil and gas imports, but also functions as a gateway for the integration of Chinese markets with those of the Middle East and, from there, Europe, both of which are important trading partners for China. For Pakistan, on the other hand, CPEC promised industrial modernization. A developing country plagued by political instability, institutional weakness, the presence of terrorism that has a history of specifically targeting foreign investments and an economy characterized by intense bust and boom cycles, Pakistan has an extremely volatile business environment and therefore found it difficult to attract investment; the Chinese now would bring in the much-needed capital to help Pakistan bridge its widening infrastructure gap. The potential was promising: With the some USD 61 billion pledged by China, the value of BRI-related investment exceeds the aggregate FDI Pakistan had received since the 1970s in monetary value (Waheed, Fischer & Khan, 2021). Particular hopes were vested in the prospect to modernize Pakistan’s fledgling power sector, which due to a combination of geological and policy misgivings - depleting domestic gas fields in a context of quickly growing energy demand, over-reliance on expensive energy imports, major circular debt as well as poorly maintained power generation and transmission infrastructure – found itself in a state of chronic calamity involving import dependence and high consumer prices, large transmission losses and regularly occurring power outages (Malik et al, 2019).

At the same time, Pakistan is, in part due to unsustainable practices in industry, agriculture and transport, highly impacted by environmental stress such as air and water pollution, soil erosion and salinization in riparian territories and degradation of agricultural land, all of which are highly detrimental on human health and livelihoods (Wolf 2020, p 232). Moreover, the nation is extremely vulnerable to the effects of climate change, consistently ranking among the top 10 at-risk States due to its proximity to (and dependence on) Monsoon rain and glacial runoff feeding into the Indus water system. Already regularly occurring climate change – related weather extremes are projected to gain pace; In the summer of 2022 alone, Pakistan was first subjected to extreme heat waves and drought, followed by what UN Secretary General Guterres called a ‘Monsoon on steroids’, which effectively submerged two thirds of the country underwater, leading to an estimated 1,700 human casualties and pushing up the national poverty rate from 3.7 to 4.0 percent points (World Bank, 2022). On the long run, water scarcity is projected to severely affect Pakistan’s development as glacial runoff from the Himalayas subsides, leaving the growing population’s water needs for private consumption and agriculture unmet (Maqbool, 2022). At the same time, Pakistan is believed to become a major emitter in the decades to come due to an explosively growing population and rapid industrialization; while it is today responsible for about 0.9% of global GHG emissions, this share may, according to an estimate by the Asian Development Bank, increase by a whopping 14 times by 2050 (Chaudhry, 2017).

In short, Pakistan faces two existential challenges, one being related to the economy, and more specifically energy insecurity, and the other to ecological and climate-related threats. In line with green growth logic, both crises can be tackled symbiotically through clean energy transition; the Indus river offers potential for hydro-power development, and long

sun hours all around the year provide the country with vast possibilities for the build-out of solar generation capacity (Adnan et al, 2012), and thus, by exploiting these energy sources, Pakistan can decrease import dependence and minimize ecological effects of power generation. How does CPEC navigate these crises, and how has Xi's announcement regarding BRI 'greening' affected CPEC project planning and implementation? Are statements such as that by Moin Ul Haque, Pakistan's Ambassador to China, that CPEC be "*people-centric, socially inclusive, environmentally friendly, and green and sustainable*" (CPIC, 2022) and that by Pakistani energy expert Ali Qureshi that CPEC can "*help the country win its battle against climate change*" (Tribune, 2022) to be taken seriously? A glance at the actual CPEC portfolio paints a different picture. Key projects under CPEC include:

- The improvement of the highway starting from the Khunjerab pass at the China-Pakistan border and, via the Karakoram highway, directly leading to the port city of Gwadar (MPD, 2023);
- The transformation of Gwadar from a sleepy fishing town into a vibrant trade hub, complete with seaport and airport (Ebrahim, 2021);
- The construction of 9 Special Economic Zones (MPD 2023);
- The construction of 8 coal power plants, 7 of which are already completed (with an aggregate generation capacity of about 6.5 GW), and 1 which is under construction (with a generation capacity of 300MW) (MPD 2023)
- The construction of 2 hydropower projects, 1 of which has been completed (720MW), 1 is under construction (870MW) (MPD 2023);
- The build-out of wind and solar capacity, with 1 solar park and 3 wind parks already built (with an aggregate generation capacity of 800MW) (MPD 2023)

In short, the energy mix of CPEC power generation projects leans heavily on coal, the not only most emissions-intensive but also most health-adverse of energy sources the toxic and carcinogenic pollutants of which are estimated to contribute to as high as 9% of deaths and to reduce life expectancy by 2 years and 8 months on average (Myllyvirta & Dahiya, 2020). Economically, the build-out of coal is at best momentarily sensible: While still relatively cheap, Pakistan's coal plants have State guarantees for up to 30 years behind their power purchase agreements, meaning that even if – or, given the projected unprofitability of coal in the near term, *when* – the assets become unprofitable or even stranded, the government will have to continue handing out capacity payments to investors (Ebrahim, 2021). In short, CPEC projects are poised to lock Pakistan into a heavily coal-based development trajectory for at least 30 years to come. Besides, road construction and the creation of economic zones will necessarily also scale up GHG emissions. Clearly, the assertion that CPEC be a 'green' undertaking does not reflect reality.

Yet this approach toward energy generation along CPEC was not entirely forced upon Pakistan by China. The year when the BRI was announced, 2013, coincided with the election of a civilian PML-N government under Nawaz Sharif, who had made it his key electoral manifesto commitment to solve the persistent energy crisis that crippled Pakistan's economy - Chinese funding was to provide the means for Sharif to fulfill his promise, and was therefore welcomed with nothing less than enthusiasm (Adeney & Boni, 2021). China and Pakistan, both having extensively advertised CPEC domestically as well as internationally, were keen to show off quick and visible results (Kugelman, 2020), and coal was seen as the easiest way to achieve this: with Pakistan sitting on the 7th largest coal depot in the world, it

was to provide a cheap and reliable alternative to expensive energy imports putting a heavy burden on foreign reserves (Waheed, Fischer & Khan, 2021). In fact, Pakistan had already designated coal as its preferred energy source since the discovery of vast coal reserves in the Thar region in the 1990s, the problem being that due to Pakistan's volatile political climate and the emerging international consensus to phase out coal among multinational development banks, Pakistan was unable to gain access to the financial resources needed to realize its plans for its infrastructural build-out (Bhandary & Gallagher, 2022). The clear preference of Pakistani policymakers for coal was underpinned by a generous system of incentives to attract investors, such as high permitted returns on equity (34.49%, as opposed to 17% for wind and solar), low tariff rates and special terms to mitigate risk for investors, including a reduced debt repayment period (*ibid*).

By 2022, CPEC energy projects had added roughly 6.5GW of installed coal capacity to the grid and overall, CPEC projects account for about 20% of the total electricity generation capacity in Pakistan (Xiaopeng, Z., 2022). The build-out of power generation infrastructure was clearly necessary to address the energy deficits that had plagued Pakistan for decades, and around 2020, as the COVID pandemic slowed down demand, Pakistan in fact generated surplus capacity for a short period of time before post-covid demand rebounded (Yang 2021). Still, however, CPEC's energy projects did thus far not yield tangible benefits for the majority of Pakistanis: Indeed, electricity prices and energy poverty, especially among rural populations, have continued rising steadily in the past years (Awan et al, 2022), and unexpected electricity outages and load shedding – i.e., deliberate supply cuts when demand is expected to be low so as to prevent failure of the entire system - are still a regular occurrence (Davies & Spender 2023).

Who benefited most, instead, were the investors: Chinese (and other) investors in Pakistan's energy sector who, thanks to the generous subsidies and guarantees by which the government had attempted to make energy investments attractive, generated profits as high as 18 times the initial investment in capacity payments within 2-4 years, irrespective of the actual profitability of the assets (Sharma, 2020). Besides, a 2021 report documents systematic malpractice and corruption among Chinese investors in the Pakistani power sector including the pocketing of up to 70% of annual profits – far exceeding the legally permitted 34,95% -, as well as the inflating of costs by Chinese plant operators (Economic Times, 2020). Corruption and other malpractices are not limited to CPEC-related energy investments but indeed are a defining characteristic of Pakistan's energy sector; a report by Transparency International of 2018, for example, outlines a range of malpractices in the oil and gas sectors, including corruption in licensing and subcontracting procedures and the embezzlement of no less than 134 billion Pakistani Rupees between 2012 and 2015 (Jenkins & Kukutschka, 2018). These practices further compound the problem of crippling circular debt within Pakistan's power sector and, as costs are passed on to consumers, contribute to rising electricity prices despite of the increase in supply (Sharma, V.S., 2020). Furthermore, while CPEC heavily focuses on adding power generation capacity to the grid, it almost entirely neglects transmission and distribution infrastructure; consequently, inefficiencies in electricity transmission leading to annual losses of up to 25% and the failure to extend the grid to underserved communities are other reasons that prevent the realization of CPEC's potential as a public good (*ibid*). Lastly, excess generation capacity as the pandemic slowed down demand (albeit only for a short time) could have been sold to neighboring countries, however, in absence of infrastructural or policy

arrangements to facilitate export, the surplus capacity simply went unutilized, hence putting an additional burden on Pakistan's balance sheets (Yang 2021).

While keeping in mind that the secrecy of BRI-related negotiations and contractual arrangements makes the drawing of definitive conclusions impossible, this short recount of Pakistan's struggling power sector implies that it was not explicitly China's but Pakistan's choice to base its energy generation mix predominantly on coal – neither did China appear to have imposed this portfolio on Pakistan, nor is there much evidence of efforts by China to steer Pakistan away from coal. Rather, it appears that Chinese financial institutions and contracting firms involved in CPEC simply took advantage of the incentives offered by Pakistan, as well as of the corrupt and poorly regulated business environment; in absence of effective monitoring or enforcement mechanisms by which China could have limited the social and ecological damage of its overseas investments, this appears to have been an easy feat. In short, China appears to have taken a rather passive stance as to the choice of energy sources along CPEC, hence not providing evidence for claims such as that of China purposefully shifting its polluting power generation technologies to its BRI Pakistan; however, also President Xi's promise to 'green' the BRI or phase out coal did not have a notable impact on CPEC either. The question, then, becomes why Pakistan opted for coal despite of the theoretically sound advantages of renewables over fossil fuels. Green growth narratives do not offer much insight on this matter; rather, we need to look for answers in the body of academic literature that takes a more serious look at the practical obstacles to clean energy transitions.

The Energy Transition: Why does Green Growth not Materialize?

A key reason that prevents the switch to renewable technologies for low-income countries is that they typically involve higher upfront capital costs, that is, the costs of purchasing and installing the renewable energy system including generation assets and transmission lines connecting them to the grid (Solangi et al, 2021). It might be true that on the long term, savings from renewable energy generation eventually will outweigh the initial capital cost, however, low-income countries often simply lack access to necessary funding to install the assets. Furthermore, the economic advantages of clean power generation can only be realized if investments are also made in the creation of a workforce skilled in installing and maintaining the system because in national contexts that are inexperienced with renewable technologies, inadequate project development or operation may result in assets becoming a liability rather than an added value (Solangi et al, 2021). This, in fact, is what happened in Pakistan: the only solar park in Pakistan's CPEC portfolio, the Quaid-e-Azam Solar Power Park, was built in the middle of the Cholistan desert; unfortunately, project developers did not take into account that solar panels are less efficient when covered by dust and sand, which ended up leading to efficiency and output losses of up to 70% (Khaliq et al, 2015). This experience might well have further reduced the confidence of Pakistani policymakers to promote solar technologies, despite Pakistan's vast potential for this source of energy.

Secondly, some renewable energy sources, especially wind and solar, are intermittent; in layman's terms, the wind doesn't always blow, and the sun doesn't always shine, which diminishes the reliability of the energy system to match electricity demand with supply. This may not only lead to shortfalls in peak demand hours, but when added to the central power grid may also destabilize the entire system due to frequency and voltage anomalies as well as system overloads (Hivepower, 2021). There are solutions to restore power

grid stability for power generation systems with added renewable capacity, such as the installment of storage capacity, high-accuracy supply and demand forecasting, and interconnecting different energy generation systems through ‘smart’ technology that switches between power systems to balance supply and demand. It is beyond the purpose of this essay to describe these mechanisms in detail; the point is that the installation of alternative power generation capacity such as solar and wind, besides coming with higher initial capital costs, also makes grid management more complex, which besides requiring a skilled workforce also presupposes sound governance of the energy sector including coordinated policy-making across sectors and provincial governments, and institutional capacity long-term planning. Among other things, this means that energy policies must be designed by developing consensus between government and opposition to ensure that a long-term vision for the energy transition can be realized; uncoordinated and disrupted policy-making due to political rivalries may prevent the benefits of the energy transition to materialize (Tang et al, 2022). In Pakistan, by contrast, governance of the energy sector, as described earlier, is highly dysfunctional; policymaking is inconsistent and uncoordinated and often informed by loyalties rather than reason, payment default by consumers increases circular debt and corruption swallows public funds. Rather than looking for long-term sustainable solutions, what was sought were quick fixes to increase energy availability and to diminish the occurrence of power outages already causing annual losses worth billions to Pakistan’s balance sheets (Sharma 2020).

In order to avoid the above-described obstacles associated with solar and wind, countries with suitable hydrological conditions tend to opt for hydropower as their renewable energy source of choice. Hydropower is a clean source of energy and does not pose intermittency problems as electricity output can be adjusted up or down relatively easily so as to match demand. Pakistan, with the Indus river and its tributaries extending across the country, does have adequate conditions for hydropower development and hydropower does contribute the largest share in Pakistan’s renewable energy mix. However, in order to realize the potential of hydropower for the benefit of the people, a number of requirements ought to be met in order to mitigate social and ecological implications of hydro-dam construction which often destabilizes ecosystems in its surroundings, diverts water from its natural course – thus potentially leading to water scarcity and climatic changes in downstream regions – and may require the relocation of adjacent communities. To mitigate damage, it therefore is crucial that environmental risk assessments and consultations with stakeholders, including local communities, are conducted in the planning phase ahead of dam construction, so that damage can be limited and compensation for affected local communities can be agreed upon. In Pakistan, such standard procedures are systematically foregone leading to tension between government and communities which are negatively affected by the dams themselves and the water diversion they cause (Shad, 2021).

Such challenges, in principle, affect any nation embarking on the clean energy transition; however, they will be indefinitely easier to manage for small, wealthy and politically and socially stable countries. Pakistan not only is one of the poorest nations in the region, but also one whose political affairs are dominated by the omnipresent military apparatus – an institution that, rather than investing in human development, is preoccupied with its paranoid rivalry with India, to the effect that large shares of Pakistan’s anyways tight budget are channeled toward the military rather than the civil purposes where they are direly needed. Furthermore, severely inadequate fiscal policies over the past decades, a hostile investment

climate, pervasive corruption and an overwhelmingly poor population unable to pay taxes, as well as import dependence and the failure to consolidate strong export industries render government revenue low while debt keeps rising, with IMF bailouts requests to keep the economy afloat in harder times having become routine. While, thus far, Pakistan has managed to recover from economic shocks, the contemporary coming together of various crises all at once – the pandemic, price hikes and inflation, the 2022 environmental catastrophes – have led to well-founded fears that this time Pakistan may be headed towards government default similar to that of Sri Lanka in 2022. Indeed, as the Pakistani Rupee continues on its freefall, foreign exchange reserves dwindle and debt mounts, Pakistan is well on its way to repeat Sri Lanka's fate. If political will to push the clean energy transition forward had been weak ahead of 2022, it now has entirely vanished from the agenda as the highly import-dependent State scrambles to procure even essential necessities for its people.

Discussion & way forward

As we are faced with an “*abject failure*” to reach the Paris goals (Anderson, 2022), it might be worth to start asking serious questions regarding the optimism to achieve global ‘green growth’ anytime in the near term. The notion that there are simple technological or market ‘fixes’ by which an ecology-economy symbiosis can be catalyzed is a distant utopia especially for a large share of States in the global South which lack access to financial means and/or the necessary political conditions to embark on the clean energy transition. Anecdotal success stories, such as that of the UK, Sweden or Denmark which have purportedly decreased domestic emission without forfeiting economic growth, may serve to demonstrate that green growth, in the sense of a relative decoupling, is more than science fiction; however developed countries fashioning themselves as ‘climate leaders’ themselves engage in extensive ‘greenwashing’ as their decarbonization successes are typically based on a carbon accounting methodologies that do not include emissions they are indirectly responsible for but that are not strictly defined to their territories such as international aviation and shipping, but also the outsourcing of emissions-intensive industries within value chains to developing countries. To give an example, the UK's self-reported carbon dioxide emissions reductions – 51% below 1990 levels in 2020 in line with its official carbon budget accounting – shrink down to 15% when international aviation, shipping, imports and exports are added to the equation (Anderson, 2022), and the financial sector of the city of London alone, through their lending and investment practices, is responsible for emissions 1.8 times higher than that of the entire UK (Jones, 2021). Furthermore, in order to reach their 2030 decarbonization targets, many governments' decarbonization strategies rely on highly speculative “*negative emissions technologies*” which to date exist at best as small pilot studies (Anderson, 2021). Besides, using individual success stories from very specific contexts (wealthy, already industrialized countries) and in order to make a case in favor of ‘green growth’ as a proximate *global* possibility constitutes an inductive fallacy: Differences in context and capacities between such countries as Sweden and such ones as Pakistan hardly warrant a generalization from one to the other. The current global energy crisis, rather than giving momentum to the global clean energy transition, appears to be widening the North-South divide as developed countries that are highly dependent on whatever energy source is available – and which still are predominantly fossil-fuel based, including such ones as waste or wood - are faced with Western-centric moral and financial pressures to reduce their consumption thereof (Yergin, 2022).

The claim made in this Paper is not that those measures on which ‘green growth’ theory relies are invalid. Certainly, technological solutions, setting market incentives right and other mechanisms such as carbon trading schemes, are all important tools in the fight against climate change, and research and innovation in climate technology, including negative emissions technologies, should continue to be pursued vigorously. However, given that we are currently lacking a ‘silver bullet’ to climate change, it must be acknowledged that ‘green growth’ and ‘green economies’ are *ideals* – and the value of ideals to motivate the achievement of some public good depends on the sincerity by which they are communicated. The continued advancement of some poorly conceived notion of ‘green growth’ as the solution to climate change by governance institutions, Statesmen, financial actors and businesses despite lacking evidence that current (rising) emissions trends might reverse on a global level anytime soon give such narratives a propagandistic touch that, rather than providing guidance, conceal the failure to achieve meaningful progress in terms of real GHG emissions reductions and fail to provide solutions for challenges for which green growth paradigms simply have no solution, such as the massive funding gap to finance a global clean energy transition in a manner timely, political obstacles to the adoption of renewable energy in many developing countries in particular and the continued lack for viable solutions to decarbonize the transport sector, to name a few. Rather than tackling these challenges with the necessary urgency, those in charge continue ‘greenwashing’ their energy and climate policies so as to create the appearance of progress. Rather than providing solutions, thus, green growth narratives distract from the need for immediate and radical climate action, as well as from other discussions that might warrant more attention; perhaps what’s needed to prevent the climate catastrophe, rather than the proposition of every-more fancy technological solutions that effectively only exist on paper, is a more profound change in the manner by which consumption and production are organized on a global scale. Given that such propositions – ranging from advocacy for circular economies to more radical ones proposing a restructuring of the global capitalist economy and a return to (partial) self-sufficiency and needs-oriented production – likely would involve a reconfiguration of socio-economic hierarchies, and therefore it is little surprising that they do not find much popularity with governance and economic elites. Thus, ‘green’ rhetoric continues to serve to justify a proliferation of business-as-usual activities with minor tweaks that are ultimately insufficient to achieve the Paris goals.

The case described above – the BRI and CPEC more specifically - make the deceptive character of ‘green growth’ narratives painfully obvious. Data leaves no space for doubt that the BRI involves a significant upscaling of global GHG emissions and that, in its current design, contributes to lock-ins of lower-income BRI countries into high-emissions development trajectories. China’s announcements regarding the ‘new’, green BRI did not seem to have nudged a real paradigm change in the way investment decisions are taken and implemented, with the rather cosmetic changes that were actually made being wholly insufficient to achieve anything that could be described in the terms of an ‘ecological civilization’. And a real paradigm shift is what would be needed: The analysis of climate scenarios by Tsinghua University mentioned earlier estimates that, in order to achieve the 2 degrees Paris goal, investment in clean infrastructure would need to amount to 11.8 trillion USD by 2030, or 785 billion annually for the power, transport, building and manufacturing sectors of 126 key BRI countries – which is 2.4 times larger than the total global clean energy investments in 2018, and would require *‘decarbonization trajectories and investments which have not been seen anywhere in the world’* (Jun, Sadek et al, 2019). Even if ways to bridge this

funding gap were to be found, simply pouring money into clean technologies might not lead to the desired results if disruptive political conditions and weak institutional capacities in FDI-receiving countries prevent the integration of clean technologies in such way that they benefit both the economy and the ecology.

What, then, is the way forward? A first step is to move beyond rhetorical commitments and over-reliance on techno-optimistic solutions that might be available at an undefined point in time - if at all -, and to treat the climate emergency as what it is: an emergency, the response to which cannot be postponed indefinitely. Developed countries, in line with the principle of climate justice, must drastically upscale their climate mitigation ambitions, with climate scientist Anderson proposing a complete decarbonization of developed economies by 2035 at the latest (Anderson, 2021), but also much more commitment in terms of financing, skill transfers and technical assistance to the developing world. Prudential regulation of country's financial sectors is an indispensable aspect of this, with the aim of steering lending practices away from high-emissions investments. The same is true for China, which is still classified as a developing country but which, due to the impact its investment practices have on the future development of many of its BRI partners, must match its discursive commitment with on-the-ground activity by adopting a far more active approach with respect to the design of its investment portfolios, project planning, implementation and monitoring. Rather than attempting to talk away the environmental impact of BRI projects through empty talk and ineffectual policy documents, China would benefit, on the long term, from acknowledging the advantages of a true commitment to investment in the clean energy transition along the BRI, not only due to its own vulnerability to climate change but also since as the largest producer of sustainable products such as solar panels and batteries for electric cars, the creation of markets for such products makes this an economically much more sensible policy option than investment in soon-to-be unprofitable fossil fuel technologies.

For Pakistan, the State's future, in terms of its economic development and its future emissions pathway, hinges on its ability to avert the looming economic and humanitarian catastrophe. Pakistan's most immediate need, therefore, is to prevent a government collapse à la Sri Lanka. To this end, the government has re-initiated negotiations with the IMF regarding a \$7 billion assistance package, the disbursement of which had been stalled due to Pakistan's failure to meet conditions tied to it, such as monetary and fiscal reforms related to currency liberalization and tax collection. On the short term, hence, Pakistan's future hinges on its ability to come to an agreement with the IMF. On the long run, however, Pakistan will require more profound reforms than to simply patch up damage with bail-out packages by international donors. Such reforms, which are elaborated in more detail elsewhere (see e.g. World Bank, 2023; Asian Development Bank, 2022; US State Department 2022) must aim to increase government revenue through fiscal reforms, including the enhancement of tax collection capacity and subsidization policy especially for the energy sector; the weeding out of patronage networks, clientelism and corruption that divert money away from investment in human development and promotion of domestic productivity; the establishment of a sense of accountability and the protection of intellectual property rights as well as the resolution of internal and international tensions that create an instable investment climate and prevent economic integration of regional markets. These and other reforms are not easily pushed through and may be painful on the short run, but are crucial for Pakistan's viability as a State, and it is unlikely that Pakistan would be successful in managing the energy transition, even

with the help of international funding unless pressing economic, social and political issues are not resolved.

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