Power on the grid

Understanding coal lock-in and regime resistance in Philippine energy transition

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Understanding coal lock-in and regime resistance in Philippine energy transition

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Abstract
Diverging from conventional framings of energy transition as a strictly, or predominantly, technological shift, this article brings attention to the power shift necessary to, and the power struggles constitutive of, the making of a low-carbon future. Through a study of the Philippine energy landscape and its key players, I demonstrate how the country's coal-dependent energy system created the conditions for guaranteed wealth accumulation and oligarchic control of the on-grid electricity system. This, I argue, contextualises the resilience of coal use for power generation in the main islands, notwithstanding the viability and desirability of renewable energy deployment across the archipelago. Drawing insights from critical social theory, and political ecology in particular, the paper illuminates how durable power structures in society could render energy trajectories highly resistant to decarbonisation, which favours a more pluralistic, decentralised system of energy provision – viewed as risky and/or insufficient at sustaining the economic base of established players. Energy producers' strategies to manage the transition thus prioritise defence of existing market share and mitigation of risks that might arise from a coal phase-out – at a cost that stands to be borne by ratepayers and taxpayers. A low-carbon shift, the article contends, will require confronting long-standing inequalities in the Philippine energy system to enable environmentally and socially just energy pathways.

Keywords: energy transition, coal, Philippines, power plants, renewables

1. Introduction

Since the Industrial Revolution, the extraction of fossil fuel resources has been critical for sustaining the energy requirements of a growing global economy. Coal, natural gas, and oil emerged as the dominant sources, accounting for more than 80 per cent of current global energy supply (IEA, 2021b). Critical to averting the worse effects of climate change is a drastic rollback in the production and consumption of fossil fuels. About a third of oil reserves, half of gas reserves and 80 per cent of coal reserves must remain unused (McGlade and Ekins, 2015) to keep global temperature rise well below 2 degree Celsius this century. The phase out – or phase down – of coal, the single largest source of CO_2 emissions globally, is considered especially urgent to achieve this goal (UNFCCC, 2021).

While the historical contribution of developing countries like the Philippines to carbon emissions is small, continued reliance on fossil fuels comes at increasing environmental and economic costs. Together with Indonesia and Vietnam, the country has seen a steep increase in coal-based energy production in recent decades to service growing electricity needs. Increase in coal-fired generating capacity has also been dramatic, at 10,944 megawatts or 41.7 per cent share of the current installed

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capacity (Department of Energy, 2020c). Such sizeable investments in coal-based energy have raised concerns that this will lock the country into a high carbon pathway and undermine its ability to meet its pledges under the United Nations Framework Convention on Climate Change adopted in Paris in 2015 (otherwise known as the Paris Agreement). Coal and coal-related investments further run the risk of 'asset stranding' – a situation whereby energy resources or infrastructures have to be retired prematurely, i.e. before their intended lifespan or prior to investments having been fully repaid, due to changes in climate policy (Caldecott, 2018). Continued investments in coal could therefore heighten the risks and increase the likely costs of transition (Kefford et al., 2018). Growing coal consumption in the region could moreover end up extending a lifeline to the coal industry (Cornot-Gandolphe, 2016) and offsetting emission cuts undertaken elsewhere (Tsani and Overland, 2021).

For island nations such as the Philippines, a shift to a renewable energy system is considered especially fitting given its archipelagic geography and renewable energy endowment (Weir, 2018). A centralised fossil-fuel based system entail significant grid investments to expand electrification which in the Philippines are especially costly and present huge upkeep given the country's geography and susceptibility to natural disasters. Renewables are supportive of smaller-scale and more dispersed systems of energy provision which could promote electrification in remote and sparsely populated islands in the archipelago – many of which still lack access to (a stable supply of) electricity. The country also has significant indigenous potential for solar and wind, aside from geothermal which it already produces in abundance. Reliance on coal, in contrast, has heightened import dependence: coal accounts for 39.3 per cent of total energy imports, and 70 per cent of coal supplies come from overseas (Department of Energy, 2020b). This undermines energy security and increases vulnerability to foreign exchange and commodity price swings. Vulnerability to climate-related risk further takes a serious toll on economic development, not to mention ecological damage and loss of human lives.

This paper aims to shed light on the conditions that facilitated the growing share and eventual dominance of coal in the Philippine energy mix – most notably in the period following the passage of the Electric Power Industry Reform Act (EPIRA) of 2003, which mandated the privatisation and deregulation of the power sector. It looks at the key actors and institutions involved in coal-fired power generation in the Philippines, and the politico-economic considerations that favoured (and that continue to favour) coal over other fuel sources, indeed despite the growing availability, technological advances and price competitiveness of renewable energy in recent years. This could help illuminate the power relations that sustain the current energy regime – its 'conditions of possibility' – as well as identify ways to facilitate a low-carbon transition in ways both environmentally and socially just.

While the empirical focus and findings are country-specific, the challenges faced in the Philippines also bear marked resemblance with those encountered in other developing countries in the region and elsewhere. The wave of privatisation undertaken by developing countries – an estimated 7,860 privatisation transactions took place across 120 developing countries from 1990 to 2003, including in the energy and power sectors (Kikeri and Kolo, 2005: 3) – dramatically changed the structure and ownership of the electricity industry. This raises important questions on the ability of national governments to re-align their energy policies swiftly and effectively in contexts

where decisions over fuel technologies rest mainly in the hands of the private sector. Crafting appropriate policies that would incentivise the private sector to support, and accelerate, an energy transition remains a crucial and urgent challenge, especially as developing countries have increasingly seen an increase in coal-fired capacity in recent years given their higher carbon emission thresholds compared to developed countries. The phase out, early retirement or roll-back of conventional energy infrastructures that are owned or operated by private firms will also come at huge financial costs – which is poised to be shouldered by taxpayers given the terms of, and guarantees required by, power sector reform in many of these countries. There is, in this regard, an urgent need for more focused studies on energy transition that capture the experiences of less affluent countries and that are attuned to the differing challenges present in these settings. Indeed, as scholars have noted, the strong focus of the current literature on a few core countries has constrained the applicability of existing models of energy system change in peripheral/marginal regions (Bridge, 2018). The uneven pace and scale of decarbonisation in different parts of the world moreover highlight the urgency of incorporating – and elevating – the plurality of struggles that exist and how these are being addressed in diverse ways.

The data is drawn from primary and secondary sources. Interviews (virtual and in-person) with government representatives, development agencies, energy producers, academics and analysts, and civil society organisations were conducted from 2019-2021. Publicly accessible data, such as official regulatory filings, status reports, by government and private bodies have also been sourced for data. Data on the Philippines were based on official government statistics and cross-referenced with other energy databases such as Urgewald and Global Energy Monitor. The paper first reviews the relevant literature on energy transition, highlighting the need for social science perspectives and analyses on the power relations that support the fossil fuel regime, especially in Southeast Asia which has been a hotspot for the expansion of coal-fired power generation (section 2). This is followed by a background on the evolving use of coal in section 3, and the context for the Philippines' paradoxical position towards coal given its avowed goals of achieving environmental sustainability, energy security, and affordability. In section 4, I demonstrate how the steep growth in coal's share in the Philippine power mix has its roots in the pro-market reforms undertaken in 2001 as the task of power generation came to be controlled by the country's largest private firms. The competition for market share, pursuit of scale economies and high profitability saw firms preferring coal power plants and projects. Section 5 delves into public and private sector response to energy transition and the considerations that underpin current initiatives to phase-out coal. A key finding is that while the major players have taken steps towards 'greening' their portfolio, coal remains a central component of the business and at sustaining their economic position. Energy producers' strategies to manage the transition prioritise defence of existing market share and the mitigation of risks that might arise from a coal phase-out, at a cost that stands to be borne by ratepayers and taxpayers. The conclusion discusses the significance of these findings, and the challenge to oligarchic power required to ensure that transition produces egalitarian outcomes.

2. Literature review

Contemporary concerns on energy transition highlight the need for a 'radical, systemic and managed change towards 'more sustainable' or 'more effective' patterns of provision and use of

energy' (Rutherford and Coutard, 2014: 1353). While conventionally framed as a technical or technological challenge, i.e. as a shift in fuel source from fossil fuels to renewables, more recent research have emphasised the social implications and socially-mediated nature of the transition process. Social science perspectives have drawn attention to how social structures and institutions shape the pace, scale and nature of transition (Andrews-Speed, 2016); the reconfigurations in economic and social activities entailed by a low-carbon shift (Bridge et al., 2018); and the significance and consequences of transition for diverse actors (e.g. states, firms, workers) (Van de Graaf and Sovacool, 2020). A central theme and common commitment of social science research on this topic is to challenge dominant approaches that reduce transition as 'one of physics' or engineering (cf Bossel, 2006), foregrounding instead the deeply political nature of transition: as ultimately a struggle over the kind of future society people want to live in.

While early transition theories have made laudable steps at integrating the 'social' and 'political' in their analyses, notable among them the multi-level perspective (MLP) framework (Geels, 2002, Smith et al., 2005, 2010), a number of important gaps remain. As a heuristic for understanding socio-technical change in energy systems, the MLP, and iterations of it, remain heavily focused on niche technologies and innovations, and the process through which they scale up or proliferate to compete with or displace the old energy regime. While there is wide recognition that transition involves destabilisation and conflict, albeit also subject to cooptation (often captured in concepts like 'path dependency and lock-ins'), it remains ambiguous on the 'agents' and the 'activities' that lead to or prevent such a shift from occurring (Dóci et al., 2015). Thus, the incumbent regime appears as a 'monolithic barrier[s] to be overcome' (Geels, 2014: 3).

Since 'transitions are just as much about the decline of incumbent industries as the rise of new ones' (Fouquet, 2016), greater attention to how fossil fuel industries are managing the possibility of decline, disassembly or phase-out is needed to assess the potential for rupture in the current energy configuration. Numerous studies have shown that outgoing industries are well-positioned to undermine a swift and radical energy shift (Kern and Smith, 2008, Madureira, 2014), favouring instead the 'greening' of a fossil-fuel based energy system (Bosman et al., 2014, Fuenfschilling and Truffer, 2014), such as through carbon capture technologies. Even in countries where renewable energy deployment has led to a significant share in the energy system, scholars found that 'empowering renewable technologies may not suffice, and that existing high-carbon infrastructures will need to be actively removed' in order to meaningfully curb greenhouse gas emissions (Leipprand and Flachsland, 2018). The process of energy system change will thus involve confronting the particular conditions that sustain fossil fuel use. In liberal market economies, this has taken the form of disinvestment in fossil fuel industries, particularly coal, or preferential treatment (e.g. in dispatch, price) for renewable sources, leading to declining market share for fossil fuel sources. However, with energy research based mainly on key industrialised economies in Western settings, and in fact, on 'a relatively small number of national crucibles', notably the UK, United States, the Netherlands, and Germany (Bridge, 2018: 16, Sovacool, 2021), insights on the challenges associated with transition remain heavily informed by their experiences and concerns that are not necessarily representative of transition dynamics elsewhere. This geographical unevenness further means that energy transition in 'critical' regions such as East and Southeast Asia, home to some of the largest consumers and suppliers of coal, remain relatively under researched. The International Energy Agency finds that Southeast Asia's growing energy

demand has been mainly serviced by coal, given its wide availability and cost competitiveness over other sources. This has led to the doubling of coal consumption in the region over the past decade, as other regions showed, in contrast, a structural decline in coal consumption (IEA, 2020).

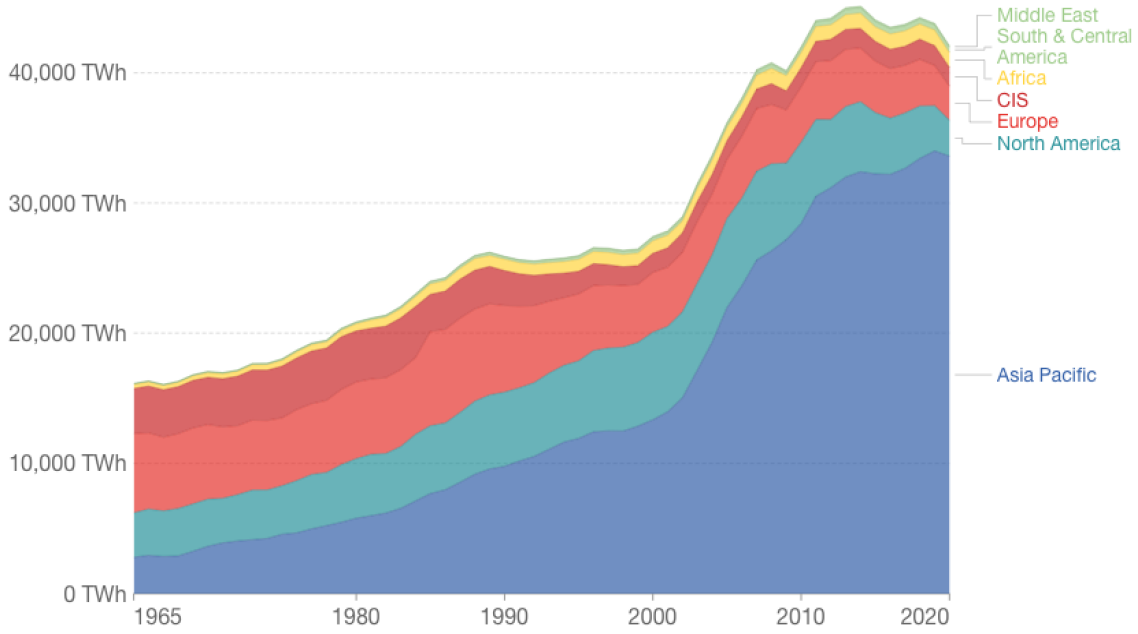
Research on energy systems beyond the 'core' could help bring to light the distinctive energy trajectories currently at play and the place-specific barriers that exist that inhibit the shift to renewable sources. Research in developing country contexts in recent years, for example, have shown how different governance structures, state capacities and local/community engagement mediate energy transition in particular ways (e.g. Oskarsson et al., 2021, Tan et al., 2021). Such differences, as Marquardt and Delina (2019) have shown in the case of Thailand and the Philippines are crucial in determining the success and failure of donor-driven renewable energy projects in these countries. Indeed, despite the apparent technological requisites of a low-carbon energy transition, some of the biggest obstacles in recent years are not technological but are largely due to the prevailing political, economic and social order. This highlights the need to pay greater attention to the social power relations that shape and that are in turn shaped by energy transformation. Political ecology research have shown that processes of socio-environmental change, i.e. energy transition, are 'never socially or ecologically neutral' in their effects: there are particular actors and interests that are well positioned to push for particular outcomes, outcomes which are then differentially felt across society due to differences in class, gender, or ethnicity (Swyngedouw et al., 2002: 124). The fossil fuel energy system has been integral to the making of industrialised economies, and indeed, it created the conditions for the production/reproduction of political and economic power (Huber, 2013, Bridge et al., 2018). Transitioning away from fossil fuel sources has the potential to upset these established power relations. This capacity to create new winners and losers makes energy transition a highly contested process, often courting resistance from those that are invested in the incumbent fossil fuel regime (Dóci et al., 2015, McCauley and Heffron, 2018). For this research, such understandings of transition could provide a useful framework for studying the interests invested in sustaining the incumbent energy regime and the uneven sharing of socio-environmental costs and benefits that might result. They could further help illuminate why confronting particular socio-economic arrangements, notably those that prevailed following the liberalisation of the power sector, is necessary alongside if not as a precondition to the pursuit of environmental sustainability.

3. The (un)making of a coal-based energy system

The utility of coal in industrial processes, households (i.e. heating) and steam locomotives drove its prominence as an energy source in the 16th century onwards, displacing wood's millennia-long position as the main fuel supply (Smil, 2021: 115-120). Although the early use of coal can be traced to China around the 4th century (Malm, 2016: 51), it was Britain's embrace of coal for thermal energy that is considered the historical turning point that facilitated its rise as the dominant source by the first half of the 20th century (Smil, 2021: 118). The exponential increase in energy from coal given its high power density compared to its predecessor heralded a leap in industrial capacity, initially in Britain and the West, fuelling crucial industries such as iron and steel. Developing country consumption of coal accelerated towards the end of the 20th century, mainly due to growing demand from the Asia Pacific (see Figure 1) and as manufacturing shifted East (Peters et

al., 2011). Despite a late start, coal quickly became a primary source of energy particularly in electricity generation in key East and Southeast Asian economies. Globally, it still accounts for over a third of the power mix in 2020 at 35.2 per cent (IEA, 2022), and remains the single largest power source, despite progressive increases in the share of hydrocarbons.

Figure 1. Coal consumption by region
in equivalent terawatt-hours (TWh) per year



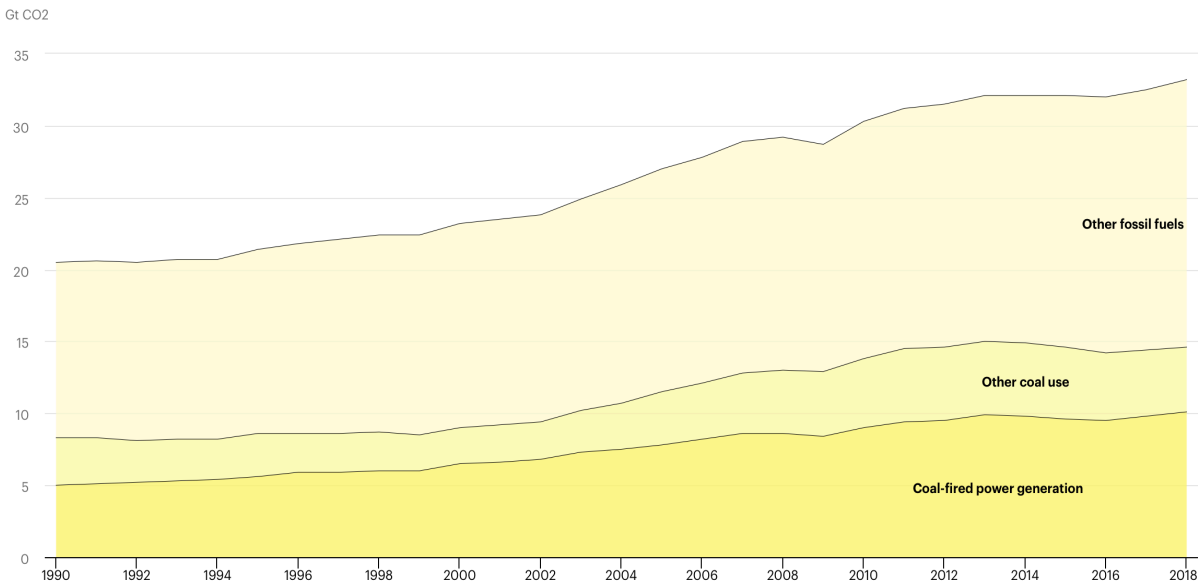
Source: Our World in Data (2021a) based on the BP Statistical Review of World Energy (2021)

Geographically, 27 countries in the Asia Pacific are responsible for about three-quarters of current global coal generation capacity (UN ESCAP, 2021). The region further accounts for 94 per cent of coal-fired power plants in the pipeline, most of them in Indonesia, the Philippines and Vietnam, and holds about 60 per cent of currently known coal reserves (UN ESCAP, 2021). This dependence accelerated in the past decade and has come under close scrutiny with the passage of the Paris Agreement: coal releases double the CO_2 emissions of natural gas when burned, and its use in power generation accounts for a significant share of carbon emissions (see Figure 2).

In many developing countries like the Philippines, achieving energy security and expanding supplies often 'take clear priority over the promotion of clean energy' (Van de Graaf and Sovacool, 2020: 173). Yet, at the same time, the country, together with a number of other Southeast Asian nations, is also consistently ranked as one of the most vulnerable to climate-related risks. The Global Climate Risk Index ranks the Philippines the 4th most affected globally to extreme weather events in the period 2000-2019 (Eckstein et al., 2021) a powerful reminder that the country 'cannot afford to ignore climate change' (La Viña et al., 2018). Under the Paris Agreement, climate pledges by developing countries as fleshed out in their nationally determined contributions (NDCs) take into account limitations in financial resources and technological access that would enable a

low-carbon shift, and the need to reconcile energy availability and security with the goal of capping emissions. Given differing national circumstances, developed countries are expected to take more ambitious commitments to reduce emissions early and to provide financing to developing countries to transition. However, to achieve the target of limiting the global temperature rise to 1.5 degree Celsius (as reaffirmed in the 2021 climate negotiations in Glasgow), 80 per cent of global primary energy demand must be drawn from renewable energy sources by 2030, and all fossil fuel sources phased out by 2050. While not major contributors to historical emissions, developing countries like the Philippines have to also ensure that current national energy policies on, and investments in, fossil fuels are compatible to this future scenario. In the electricity sector, a net zero emissions scenario will require the phase out of unabated subcritical coal generation in emerging markets and developing economies by 2030 and the phase-out of all remaining unabated coal plants by 2040 (IEA, 2021c).

Figure 2. Share of coal-fired power generation in global energy-related carbon emissions
By source, 1990-2018

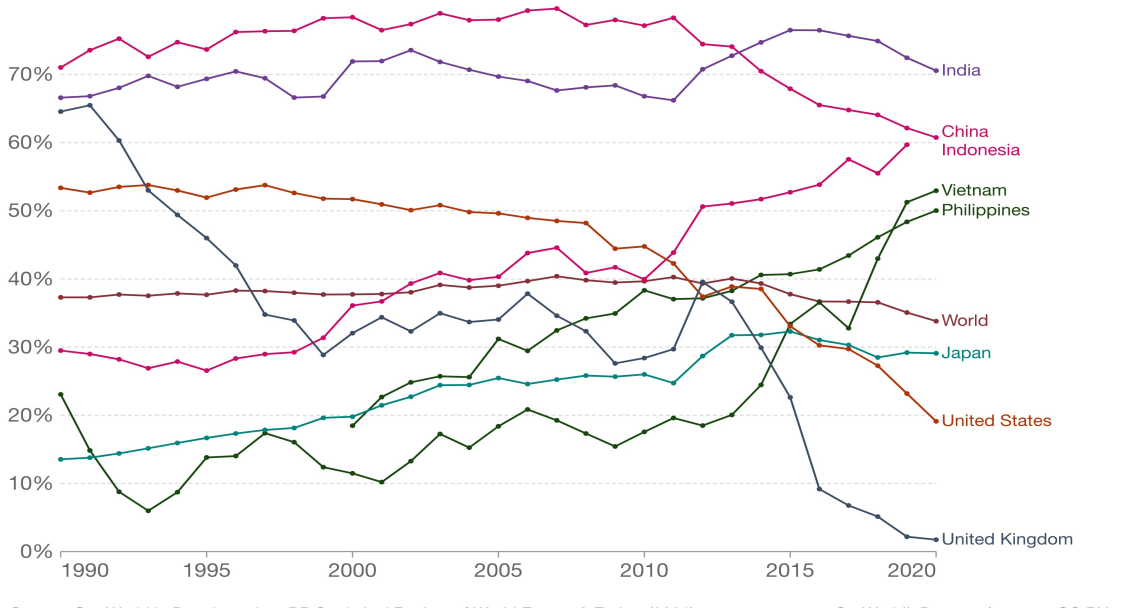


Source: International Energy Agency (2019)

The Philippines' NDC to the UN Framework on Climate Change pledges greenhouse gas emissions reduction and avoidance of 75 per cent, with 2.71 per cent of this target classified as unconditional (i.e. intended to be implemented without external support), and 72.29 per cent conditional. It further commits to 'endeavour to peak its emissions by 2030' (Republic of the Philippines, 2021: 2). Recent studies have shown, however, that the current trajectory is not in line with climate targets. As the Climate Action Tracker finds, the country's projected emissions levels are incompatible with the Paris Agreement's 1.5C target, a threshold that, it notes, 'the Philippines strongly fought for in 2015 during the Paris negotiations' (Climate Action Tracker, 2021). The massive expansion in coal-fired power capacity has specifically been singled out as a key reason

why it is unlikely to meet its NDC targets. The long lifespan of coal power plants, or the time period of operation that allows investment to be recovered, stands at 46 years on average globally (Global Energy Monitor, 2020) which implies that expansion is 'already "committed" future CO_2 emissions' (Tong et al., 2019). There are currently 28 power plants in operation in the country, majority of which are new (operating for 0-9 years), but some may already need to be retired early to align with the 1.5 degree C limit (Caldecott, 2018, Tong et al., 2019). Indeed, a recently unveiled proposal by the Asian Development Bank (ADB) targets the early closure of 50 per cent of the coal fleet in Indonesia, the Philippines and Vietnam, the three countries with the highest share of existing and planned coal-fired power plants in the region, and that show a growing reliance on coal for electricity generation (see Figure 3).

Figure 3. Share of electricity production from coal
By country, 1990-2020



Source: Our World in Data (2021b) based on BP Statistical Review of World Energy (2021) and Ember (2022)

The dominance of coal in the Philippines is especially paradoxical given the absence of a local coal industry. The largest consumers of coal are typically also the largest producers and reserve holders (with a few exceptions, e.g. Japan and South Korea). As Graaf and Sovacool (2020: 42) noted,

> Contrary to the globalist nature of oil and natural gas, the story of coal is largely a domestic one…The proportion of coal that was traded across borders historically stabilised at around 15 per cent, a level at which it remains today.

Studies that assess the extent of carbon lock-in find that lock-in is highest in countries that are abundant in coal resources, that have a history of coal mining, and that use coal extensively for energy generation, as is the case in Germany and Poland (Erickson et al., 2015, Rentier et al., 2019).

In the Asia Pacific, Australia and Indonesia follow this typology, combining resource abundance with close integration between coal mining and a predominantly coal-based power sector. Absent significant indigenous coal production and reserves, supplying the needs of the electricity sector in the Philippines meant, in contrast, a reliance on coal imports. Imported coal accounts for about 70 per cent of the total coal supply in 2020, most of which goes to power generation. This negatively impacts the country's balance of payments and is a significant factor behind the country's trade deficit. It also leaves the country exposed to price volatility and foreign exchange risks, as has been the case during the pandemic following shortfalls in supply and fluctuating demand. The Newcastle Coal Index, the considered benchmark for the Asia-Pacific market, captures the sharp swings in coal prices during this period: from a low of $46.18 per metric ton in September 2020 to a high of $195.20[1] a year later (Meredith, 2021). It is thus pertinent to unpack why despite its apparent disadvantages, coal emerged as and continues to be the preferred fuel for energy generation.

4. Producing energy

The task of energy generation in the Philippines mainly falls on the private sector. This was a consequence of the deep reforms on the Philippine electricity market initiated in the early 1990s to put an end to the power supply crisis of that period. Increasing demands from a growing population, the mothballing of the Bataan Nuclear Power Plant due to safety issues, and the inability of the debt-ridden state-owned National Power Corporation (NPC) which had monopoly over both energy generation and transmission to build additional capacity helped make the case for private sector participation. With the passage of the Build-Operate-Transfer Law of 1994, private entities were initially allowed to construct and operate power generation facilities for a guaranteed 'reasonable return of its investment and operating and maintenance costs', although most of the power generated at the time were still sold to the NPC. In 2001, the passage of the Electric Power Industry Reform Act (EPIRA, Republic Act No. 9136), which privatised the electricity industry, resulted in the unbundling of electricity generation and transmission segments which were previously vertically integrated in the state-owned National Power Corporation (NPC). Through backing from the World Bank and the Asian Development Bank (Bello et al., 2005), privatization was pursued to hasten up the penetration of private capital and broaden the ownership base: [T]he belief was that technology, the growing demand for electricity and a large pool of foreign investors in the sector, would combine to make feasible a competitive market in power generation (Tañada III and Malaluan, 2011: 3). This was expected to help increase generation capacity and deliver lower electricity rates.

Following the BOT Law and EPIRA, the private sector has progressively taken the lead in power generation. Some of the country's oldest and largest diversified companies, such as San Miguel Corporation (SMC), took the opportunity to expand into the power sector during this period indeed spinning off its core brewery business to bet big on energy as the source of the company's future growth (Rarick and Nickerson, 2008). This was initially done through acquisition of assets auctioned by the Power Sector Assets and Liabilities Management Corporation (PSALM), the government agency tasked with the sale and disposition of the NPC's assets and Independent

[1] From July 2008.

Power Producer (IPP) contracts. While the capital-intensive nature of the energy business made barriers to entry high, privatisation allowed firms like SMC to operate and own power plants without the associated large upfront investments typically required in such ventures, making it palatable even for new entrants. A number of the assets that were transferred to the private sector by PSALM, through outright sales or contracted capacities (with asset sale at the end of the contract), included hydropower, geothermal and coal-fired power plants. The power sector is considered to be 'one of the most extensively privatised power sectors in the region' (Asian Development Bank, 2018: 9).

To incentivise infrastructural investments by private players, an automatic pass-through provision was included in Independent Power Producer Administrator (IPPA) Agreements that allowed power generating companies to deflect fuel, maintenance and operating costs to distribution companies, which is in turn passed on to ratepayers. As SMC reported in its official filing to the Securities and Exchange Commission:

> Majority of the tariffs under these agreements take into account adjustments for fuel, foreign exchange, and inflation, thereby allowing SMC Global Power to pass through these costs to its offtakers (SMC Global Power Holdings, 2021: 5).

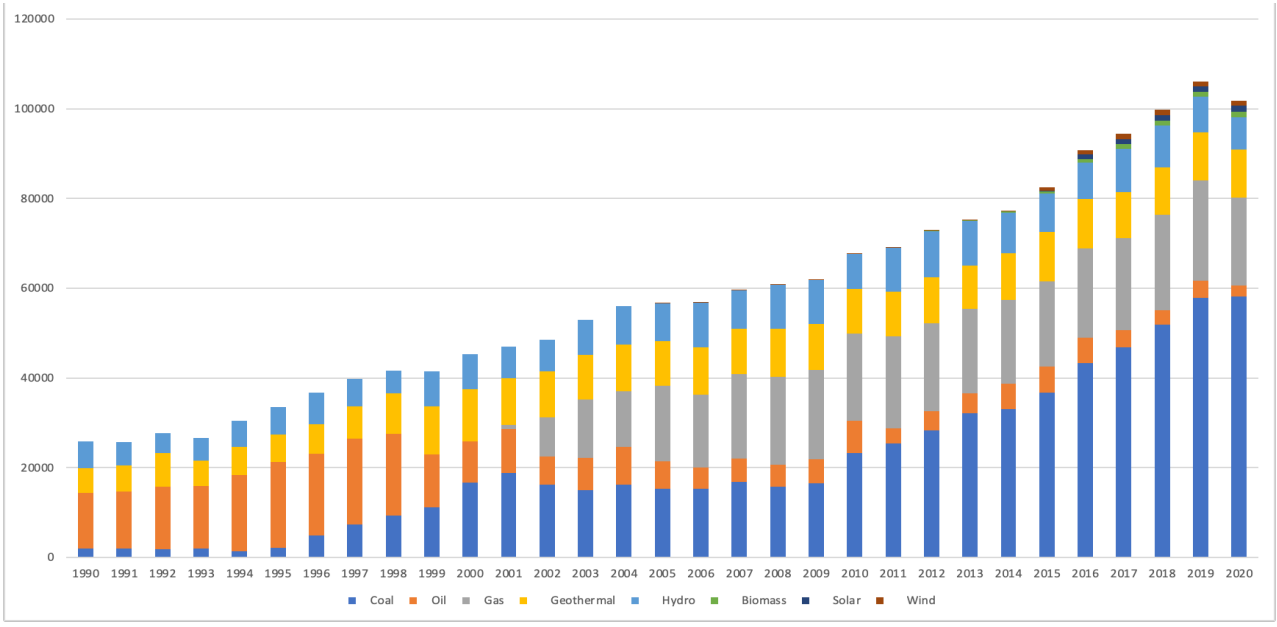
Take-or-pay contracts between coal power producers and distribution utilities moreover require the latter to purchase fixed amounts of energy, notwithstanding if the power grid is unable to accommodate the full capacity or consumer demand is low. Contracted sales have helped buffer power producers from the turbulence in the global market for coal as higher costs could simply be shouldered by end-users, thus ensuring profits are 'stable' and 'predictable' (as SMC put it) even in the context of the pandemic (SMC Global Power Holdings, 2021: 5). Such arrangements, as Ahmed and Logarta (2017: 8) commented, 'bring significant and practically guaranteed returns to developers and financiers' and disincentivises the exploration of cheaper alternatives. The typically long-term nature of power supply contracts – at approximately 15 years – locks-in coal consumption for decades, making it difficult for renewable energy to gain market share and displace coal.[2]

Fossil fuel subsidies are not uncommon in both the developed and developing world. The IEA reports that subsidies to fossil fuels for electricity generation stood at $50 billion US dollars in 2020, which was, in fact, a record low[3] given the drop in energy consumption and fossil fuel prices during the pandemic (IEA, 2021a). Although a number of countries have progressively moved to phase out direct fossil fuel subsidies, and in the Philippines this has been nearly eliminated (Asian Development Bank, 2016), indirect 'subsidies' are much more opaque. In the Philippines, pass-through clauses are encountered by consumers in their monthly bills as 'generation costs', which accounts for about half of the total bill. Pass-through provisions were considered 'standard' during the wave of privatisations of the 1990s, but other countries like India have since curbed such arrangements by imposing a limit on the transferrable risks, or by granting power purchase agreements to companies that are amenable to absorbing these costs (Ahmed and Logarta, 2017).

[2] Interview, representative of an energy research think-tank, November 2021.
[3] The fossil fuel subsidies in 2020 registered the lowest annual figure since the IEA has started monitoring in 2007.

The Philippines has traditionally depended on (imported) oil and (indigenous) geothermal energy[4], the most significant fuel sources up until the mid- to late 90s (see Figure 4). Although in the 1970s, the development of indigenous coal resources was encouraged (under the Coal Development Act of 1976), reserves are of the butiminous type (or low-grade in the coal ranking system) and coal production remained low and highly concentrated in the island of Semirara. From the mid-80s to mid-90s, the consumption of coal was roughly double that of production, with imported coal stepping in to fill the gap. From 1996 onwards however, coal demand surged as new and rehabilitated coal-fired power plants came on line or were expanded as power generation was opened up to the private sector. The additional and significantly higher capacity of these new power plants, and the clear preference for coal-fired power plants that run on imported, higher grade coal resulted to a 74 per cent increase in coal imports from the previous year, a trend that continued well into the next decades (Aragon Jr., 1997). By 2020, coal-fired power capacity rose to 10,944 megawatts from a mere 1,475 megawatts in 1995 as the number of coal thermal plants in operation grew from 7 to 28 during this period (Aragon Jr., 1997, Department of Energy, 2020c). In 2020, coal's share in the power generation mix stood at 57 per cent, the second highest in Southeast Asia, following Indonesia — the world's largest coal exporting country — at 62 per cent.

Figure 4. Power generation by source
in gigawatt hours (GWh), 1990-2020



Source: Department of Energy (2020b)

The industry structure post-EPIRA saw a handful of large firms dominate the energy landscape, Aboitiz, San Miguel Corporation and Lopez Holdings, 'a catalogue of the major scions and tycoons in Philippine business and industry' (Ahmed and Logarta 2017: 19). These firms hold control of the on-grid electricity system that services the major islands of the archipelago. Although under the

[4] Philippines is one of the world's largest producers of geothermal energy, only second to the United States.

EPIRA, no company is allowed to own, operate, or control more than 30% of any of the three major island's grids in terms of generating capacity, and more than 25% of the national grid, two major firms Aboitiz and San Miguel Corporation together account for almost half of the total market share (Department of Energy, 2020a). The Philippine energy pathway essentially reflects their investment decisions and interests, which over the past two decades demonstrated a strong bias for coal-fired power. Aboitiz has the largest coal portfolio of all energy producers at 3,638 MW, followed by San Miguel at 1,259 MW, together comprising nearly half of the total coal capacity in the country.

While private sector-led power generation has dramatically resulted in supply increases, the gains have been highly uneven as increase in megawatt rather than coverage was prioritised. On-grid areas, those that are connected and serviced by the three main power grids in the main island groups, the Luzon grid, Visayas grid, and Mindanao grid, covers key urban centres (including the nation's capital) where demand is markedly higher. These areas have been the focus of investments, indeed leading to an overbuild of coal-fired capacity in places like Mindanao that traditionally relied on renewable sources.

5. Managing the transition

Under a carbon-constrained scenario, the drastic curtailment of fossil fuel consumption is a goal to which not only states but also firms, banks, and other sections of the private sector are being propelled to commit to. This is driving policy changes in diverse sectors of the economy, especially in transport and electricity as the top contributors to greenhouse gas emissions in the Philippines. For carbon-intensive industries, a low-carbon shift poses nothing short of an existential crisis. Philippine power producers' strategies to manage the transition betray attempts to preserve the status quo, or to externalise the cost of transition, albeit simultaneously hedging towards diversifying their portfolio.

There are indicators that policy support for coal is eroding. Financial institutions such as banks have become more cautious at extending financing to coal projects. Major local Philippine banks that are key sources of financing, such as the Bank of the Philippine Islands and the Rizal Commercial Banking Corp have exited from or pledged to progressively reduce support for coal following growing concerns that national and international climate policy could render coal assets stranded. Similar pledges have been undertaken by key international sources of overseas coal financing such as Japan and South Korea, both of which hold operating coal assets in the Philippines. What is perhaps one of the most visible expressions of the shifting perception on coal in recent years came from the government. A moratorium on coal-fired power plants took effect in October 2020, as grid instabilities resulting from the pandemic made visible the inflexibility of coal-fired power in responding to sudden changes in demand.

Although such re-directions and re-inventions are a welcome change, it is already apparent that these will be insufficient to unwind decades of pro-coal policy and financing. For one, they are limited in scope and impact. The government's moratorium, for example, only covers 'greenfield' coal projects (those that have yet to receive government approval) and allows 'committed power

projects, existing power plant complexes with firm expansion plans and land site provisions, and indicative power projects with substantial accomplishments' to push through (Department of Energy, 2020d). Committed and indicative projects are those that received government approval but have yet to be built, and in the case of indicative projects, have yet to secure funding. While this will impact the pipeline of proposed coal projects, it does not outrightly prevent the construction of new coal-fired facilities. The exemption process itself is also 'mired in ambiguity', as the civic group Power for People Coalition pointed out since 'the moratorium still allows several coal projects to remain in the pipeline despite failing to meet full exemption requirements' (Yang and Ibañez, 2021). As of mid-2021, the proposed coal plants that have received government approval stands at 8.73 GW which still presents a sizeable addition to the 28 power plants in operation with a total installed capacity of 9.88 GW. The temporary nature of the moratorium also means it 'can be revoked or lifted anytime' (Fernandez, 2020). A similar issue besets the withdrawal of coal financing by private funders and power producers. Recent project cancellations announced by industry players, such as those involving conglomerates like Aboitiz Corporation and Meralco, will at best prevent new additions while keeping the current coal capacity intact.

The retirement of coal power plants is gaining traction globally as a meaningful way of cutting back future emissions, especially in consideration of revamped and more ambitious NDC targets. In the Asia Pacific, the Energy Transition Mechanism (ETM), an initiative by the ADB — which has been a key source of energy financing for fossil fuels in the region — seeks to decommission or re-purpose 5 to 7 coal facilities in Indonesia, the Philippines, and Vietnam. According to Philippine Secretary of Finance, Carlos Dominguez III, this is expected to accelerate retirement by an average of 10 to 15 years. Given that the Asian region houses 90 per cent of young (≤20 years) coal-fired power plants (Asian Development Bank, 2021), such policy could in principle present a significant leap at slashing their projected life-span, especially if scaled-up. A concern however is that the buy-out scheme through which the ETM will be operationalised, which will see the ADB acquiring coal plants using a mix of public and private funds, will turn into a bail-out for coal developers (and by extension their funders). Under the scheme, coal producers will be spared from 'shoulder[ing] their proper part in early closure expenses' as Gerry Arances of the Center for Energy, Ecology and Development (CEED) commented, 'even though many of them pursued projects aware of stranding risks and social, environmental, and climate destruction they would bring' (CEED, 2021).

Although key players like San Miguel Corporation and the Ayala Group have taken tentative steps in recent years to move away from coal, divestment — or transfer and sale of coal assets — rather than retirement is the preferred route. The addition of renewable projects in their portfolio has been modest, partly due to the lower capacity of renewable energy sources. The types of renewable energy projects that are entitled to receive government support are also deemed too small for the largest producers.[5] There is thus a risk that a pivot to natural gas as a bridge fuel will emerge as the more palatable option or alternatively, large-scale, centralised renewable energy projects to compensate for their lower capacity. In principle however, a diversified portfolio that cedes a significant share to renewables under a more decentralized system will imply a lower market share than one based mainly on fossil fuels. Indeed, this goes at the heart of one of the big conundrums

[5] Interview, representative of an energy producing company, January 2020.

in the ongoing transition: how to shift to a low-carbon energy system while preserving economic power?

6. Conclusion

A pact reiterated at the Climate Change Conference (COP26) in Glasgow in 2021 is to at least phase down, if not phase out, coal consumption given its significant contribution to greenhouse gas emissions. Curtailing the share of coal in power generation, its most significant source of demand, will be fundamental to upholding this goal. The paper delves into the challenges faced by developing countries like the Philippines as an archipelagic state and its paradoxical dependence on coal. Unravelling the reasons for the dominance of coal in the power generation mix, the findings highlight the role of private entities over fuel decisions. The sizeable market share that comes with coal-fired power, and the highly favourable terms in power purchase agreements that ensure profitability for coal producers have incentivised a large build out of coal-fired power capacity over the past decades. While this has contributed to an overall increase in power supply, it has also been highly centralised and uneven with pockets of concentration on the grid and indeed overcapacity in some areas, particularly where demand and potential for profit is highest. The costs, both environmental and economic, as well as the failure to achieve energy security, has been mainly shouldered by consumers and taxpayers.

Current policy responses to a low-carbon transition signal a shift away from coal. There are, however, severe limitations since these will simply prevent additional coal projects from materialising rather than curtailing the capacity of currently operating coal assets. Early retirement will be necessary especially since most of the coal power plants in the country are relatively new, which locks-in emissions at least over the next two decades, at a critical period for climate action. Such an initiative should have provisions that guard from cost shifting or outright bail-outs for energy producers, especially in light of the already sizeable costs assumed by the public in holding up power purchase agreements. Carve-out clauses must also be put in place to ensure that companies are made liable for their investment choices. The urgent task ahead therefore is to challenge a system that has been built and maintained by an uneven sharing of benefits and costs forged around coal. Greening the power on the grid will involve eroding the coal power base of Philippine society's most established players, while creating the conditions to transcend the grid itself. Transition, in this regard, presents an opportunity to put in place environmentally and socially just alternatives. The outcome, the article submits, is still uncertain but will undoubtedly be struggled over.

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