No New Coal?

Indonesian electricity sector decarbonisation and the Chinese overseas coal ban

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Abstract

This thesis aims at understanding the implications in Indonesia of China's decision to not build new coal power plants abroad and support developing countries in low-carbon energy take up, announced in September 2021. Indonesia is a country where coal power plants make up a very important part of the nation's electricity production, and which has heavily relied on Chinese companies and funding for their construction during the 2010s. This research aims at understanding China decision by putting it in the context of Indonesian energy sector's structure, interests and goals, which are all three of them analysed using the theoretical framework of developmental state. Data gathering relied on literature review, using peer-reviewed literature but also and mostly grey literature such as environmental NGO policy reports. After saturation point has been reached, interviews have been conducted with stakeholders, from Indonesian and international NGOs working on energy transition, as well as from the ASEAN. The findings highlight the lack of direct implication of the Chinese decision on Indonesian energy sector decarbonisation. Indonesia is a country which has based its development on coal electricity since the 2010s, considering this resource served its developmental goals and the interests of its economic and political elite. The country is now planning on fully decarbonising its electricity system by 2060, but faces many structural barriers: many interests are now vested in coal more than ever, its electricity system vastly disadvantages renewable energy, and it now has a large fleet of young, high-emitting coal power plants. To achieve its goals, the Indonesian government is seeking resources such as policy support, capacity building in renewables, and funds for grid update and coal power plant early retirement and has already secured funds from regional organisation and western countries and companies. China's decision for the moment fails at bringing any of these resources, as its promised support is not set, and only the coal power plant ban has been applied. This ban is unlikely to have much effect on Indonesia, as it is intended at making construction and financing of future coal power plants more difficult, but Indonesia has already known most, if not all of its coal power plant uptake in the past. Aside from this mis-adaptation to the local situation, the ban has several loopholes that limit its scope, such as off-grid power plants. A support of China in Indonesian decarbonisation efforts is however much hoped for by parts of the Indonesian state, even if China also suffers from a structural bias in favour of coal, that reduce the likeliness of a significant support, especially in terms of coal power plant early retirement and policy support.

Cover image: Drone footage of Jawa-7 coal-fired power plant, financed by China Development Bank and co-owned by China Energy and PLN. Source: Xinhua News Agency, 2019.

Foreword, acknowledgements

This thesis was for me a great journey into many fascinating topics I never had the opportunity to spend so much time and energy on before: energy decarbonisation policy, the role of developing countries in that effort, the type of incentive or support developed countries can provide. Ultimately, many elements to take into account in my personal political reflections and my future career.

This personal work would not have been possible without the support of many people, in so many different way possible. I'd like to thank some of them here, although they still are many other that have been there for me during the last nine month and that definitely deserve a very big thank you.

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Glossary

ADB: Asian Development Bank

ASEAN: Association of South-East Asian Nations

AZEC: Asian Zero Emission Community ; created by Japan to promote fossil-based decarbonisation technologies

BRI: Belt and Road Initiative. Known as **OBOR** in English before 2016.

CCUS: Carbon Capture, Utilisation and Storage

CEEC: China Energy Engineering Corporation

CFPP: Coal-fired power plant

Electricity mix: Share of primary energy sources used to produce electricity in one region

Energy mix: Share of primary energy sources used in one region, including direct use for heat, transport or industrial processes; not to be confused with electricity mix

EPC: Engineering Procurement and Construction

ETM: Energy Transition Mechanism; by the ADB.

GHG: Greenhouse Gases

GW: Gigawatt; unit of power (energy supplied in a certain amount of time)

IEA: International Energy Agency

Installed capacity: The maximum amount of power a plant (or a set of plants) can generate; usually in GW or MW

IPP: Independent Power Producer

JETP: Just Energy Transition Partnership

LNG: Liquified Natural Gas

MEMR: Ministry of Energy and Mineral Resources; Indonesia

NZE: Net-Zero Emissions

NDRC: National Development and Reform Comity; China

PLN: *Perusahaan Listrik Negara*; Indonesian national public electricity company

PV: Photovoltaics

RUPTL: *Rencana Usaha Penyediaan Tenaga Listrik*; General Plan for Electricity Supply; from PLN

SOE: State-Owned Enterprise

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1. Introduction

During United Nations General Debate 76th session on September 21st 2021, the president of the People's Republic of China Xi Jinping declared his country will not be building any new coal power plant abroad, and help developing country build up low-carbon energy. This declaration has been met with enthusiasm by various commentators, as China was at that time one of the biggest providers to the international coal pipeline. For many, this declaration would lead to another phase in international pressure against coal electricity, following a growing trend throughout the world (Guterres 2021; Kumar 2021; Shi 2021). In almost-constant decline in Europe[1], its planned 'phase-out' (eventually reframed as 'phase-down') has been at the centre of debates in the COP-27. Many countries have pledged to stop investing in coal, and are gradually closing their power plants (Roberts and Shearer 2021). Yet in Asia, it is still a flourishing energy despite its disastrous effects on climate and air quality. In 2018, 90% of the coal power-plants under construction were in Asia-Pacific, with countries such as China, India and Indonesia leading the way (Bénazéraf, Zhang, and Chen 2019). China, specifically has had a major role in facilitating developing countries of that region ramp up their power generation with coal, providing with capital and construction services. In that sense, this declaration could have the potential to put an end to that trend putting at risk international climate commitments and help beneficiary countries pursue their development in a more sustainable way.

1.1. Problem description

In the 2010s, China started becoming a powerful player in the installation of power plants internationally, mostly chosen by low- and middle-income countries developing their electricity network at an accelerated rate, many of them being located in South and South-East Asia (Global Development Policy Center n.d.; World Bank 2021). Out of all the energy sources, coal power plants are the ones projected to provide the most power in that process. According to the China Global Power Database, 74GW have been or are planned to be installed with Chinese investments and loans, compared with 50GW for hydropower and 27GW for gas. The proportion is even higher in countries with coal-oriented domestic policies: Vietnam, where 100% of Chinese investment (both public and private) went to coal; and Indonesia where this share was of almost 90% (Global Development Policy Center n.d.). China's presence is significant on the regional and global levels: In non-OECD Asia, 35% of the coal turbines installed in the 2010s were Chinese (Bénazéraf et al. 2019). Globally, '13% of total (…) finance for overseas coal plants was funded by entities from China' (Han Springer 2022). But this energy source has a main drawback: as all fossil fuels, coal is a direct contributor to climate change. Worse, coal-powered electricity is by far the most CO_2-emitting energy source per kilowatt-hour, emitting on average nearly twice as much as gas-powered ones, and several dozen times as much as nuclear or renewables (Bruckner, Bashmakov, and Mulugetta n.d.). The expansion of coal mining and burning is then a major danger for the COP21 climate goal of a global warming well below 2°C.

Indonesia is one of the biggest recipient countries of China's coal-fired power plant (CFPP) constructions. This construction is part of the country's development goal, where infrastructure development and specifically electrical infrastructures are considered as a prerequisite by the government and the administration. The government and the national electricity company *Perusahaan Listrik Negara* (or PLN) have dramatically increased the amount of coal power plants, and planned to continue in the following decades, making the energy system strongly reliant on coal. This increase relies partly on foreign funds and construction services, mainly Japan and China, since capital and

[1] Coal generation has been continuously decreasing between 2012 and 2020 in the EU, despite a conjunctural increase in 2021 and 2022 (Ember 2022)

Engineering, Procurement and Construction (ECP) contracts from many western countries and international institutions stated dwindled after the COP21 in 2015 (Atteridge, Aung, and Nugroho 2018). As the country seems to head towards a heavy reliance on coal for the future decades, some commentors describe a lack of debate and preparedness in the Indonesian public sector over a post-coal future (Atteridge et al. 2018). Yet since the late 2010s, an increasing net-zero greenhouse gas emission discourse have appeared at the head of the state, leading to the development of net-zero targets, and since September 2022 of plans envisioning "unabated" coal phase-out before 2060 (IEA and MEMR 2022).

The urgency of the climate and biodiversity crises has resulted in an environmental discourse that has grown in strength in China. The leading concept of 'Ecological civilisation' (生态文明) is since 2018 even enshrined into the constitution of the People's Republic of China (Goron 2018). This is in this context that during a message to UN's General Assembly, Xi Jinping made his declaration. 'China will strongly support developing countries in the development of green, low-carbon energies, and will not build new coal power plants projects outside its borders.'[2] This declaration (hereafter called "the declaration" or "China's pledge") has two parts to it: one negative incentive against further coal development, and one positive incentive, for the use of cleaner energy instead.

In March 2022 the declaration received its first and to this date only major legal translation with the 'Opinion concerning the continuation of a collectively-shaped green development for the Belt and Road Initiative'[3] issued by China's National Development and Reform Commission (NDRC). Despite a general positive review of the decision (hereafter, Xi's declaration, collectively with its legal translation and application of it will be called "China's decision"), critiques nonetheless also arose throughout the process. Some critique puts emphasis on the non-inclusion of domestic coal (Brant 2021; Kumar 2021; Ni and Sullivan 2021), despite China being by far the biggest coal-energy producer and its domestic energy market the biggest contributor to the coal pipeline (Roberts and Shearer 2021). Several experts also highlighted the appearance of many loopholes for the coal ban, and the lack of concrete application of the support for low-carbon energy (Han Springer and Ma 2021; Li, Li, and Bo 2022; Suarez and Wang 2022). An example of this uncomplete translation is the inauguration in August 2021 of a new Chinese-built coal power plant in Morowali, Indonesia, by the Chinese ambassador (Zhu 2022).

Morowali's example shows the ambiguity of the Chinese authorities to fully implement the policies they themselves enacted. In both countries, key actors are in the middle of contrary incentives, as classic developmental objectives and coal interests clash with new climate goals and regulations. Indeed, from an economic standpoint, the development of coal is beneficial for all state and private actors involved. China has available liquidities and powerful energy companies that are in need of new markets while internal market expansion is slowing down (Bénazéraf et al. 2019). On the other hand, developing countries such as Indonesia are in need of investors for their ambitious developmental plans, where energy and infrastructures are key (Tritto 2021). China's new coal ban comes in an environment where most powerful stakeholders, both public and private, have interests vested in the coal industry: Chinese financial actors, Indonesian national and local governments, as well as both countries' energy and extractive sector companies. Most of these actors also have been described as unprepared for post-coal energy systems throughout the 2010s (Atteridge et al. 2018; Gunningham 2013).

[2] Translated from the original Chinese sentence: "中国将大力支持发展中国家能源绿色低碳发展，不再新建境外煤电项目。"

[3] Translated from the original Chinese title: "关于推进共建'一带一路'绿色发展的意见"

This thesis aims at understanding the implications and translations of Xi's declaration and by putting it in the context of Indonesia, one of the countries that beneficiated the most of Chinese coal power plants in the last decades.

It does so by aiming at understanding the background in which this new policy lands. The structure of the electricity system in Indonesia, with its actors, their needs, their goals and interests. This thesis also aims at understanding the dynamics that led to coal capacity increase in the 21st century, and the ones that occurred since then. This research will try to give an overview of the intensive for and against coal, at a national and international level, based on literature review and expert interviews. This will allow to have a better understanding of the Chinese declaration, by understanding the needs in terms of decarbonisation of one of the countries this policy affects, and comparing them with what this decision provides.

1.2. Research questions

Main research question

To what extent is China's pledge to stop building coal and to support renewables affecting Indonesia's energy development and carbon emissions?

Sub-questions

What are the political and economic conditions that have led to coal-electricity surge in Indonesia?

How is Indonesia envisioning its net-zero pathway for the electricity sector?

How does China's decision enable actors to engage in electricity decarbonisation abroad ?

1.3. Thesis overview

This thesis is organised as follow. The conceptual framework is laid down in Chapter 2, followed by the methodology in Chapter 3. Chapter 4 to 6 are the result chapters. Chapter 4 is detailing the causes that led to a significant increase in coal electricity during the early 21st century in Indonesia, as well as the consequences for today's state structure and electricity governance. In Chapter 5, the focus will be on the new objectives of net-zero in Indonesia, the existing and planned transformations, the inner barriers as well as the potential enabling role of foreign actors. Chapter 6 specifically details the role of the Chinese declaration, and its implications – or lack of thereof – in Indonesia. This chapter is divided in two sub-chapters, on the coal ban proper and on the proposed low-carbon energy support. Chapter 7 discusses the results, putting them into the broader perspective of countries affected by the ban and of Chinese environmental leadership, as well as comparing those results with the existing literature. Finally, concluding remarks will be done in chapter 8.

2. Conceptual framework

This chapter elaborates on the theories used in this thesis to explain The Indonesian reliance on coal electricity and the implications of the Chinese decision on that sector. Developmental state, a field of research within political economy has been chosen to explain approach to energy issues in the Indonesian state, and to a certain extent in the Chinese state.

Political ecology is a pluri-disciplinary approach to environmental issues. It incorporates elements of environmental sciences, as well as others from social and political sciences disciplines, specifically from political economy (Neumann 2009). Much like its predecessor political economy, political ecology is a field critical of political and economic structures where normativity is often embraced, considering scholarly neutrality as being impossible in such a field (Benjaminsen and Svarstad 2009).

Political ecology has evolved into many different subfield, with different methodological and conceptual foundations. They still share common traits, one of them being the interlap between different scales: local, national and international to understand the causality behind environmental degradation (Benjaminsen and Svarstad 2009).

Indonesia: Developmental state

"Developmental state" is a literature that looks into state structures and strategies to promote development, and can be helpful to understand the Indonesian government in regard of energy policies. The developmental state literature also takes into account international economic structure in its analysis, as much of the political economy field does. Developmental states are part of the third world, or global south (Leftwich 1995), situated at the periphery of the world economic structure. They are often former colonies that have an economic system (at least partly) inherited from extractive economic structures (Routley 2012).

According to Swilling et al., "a defining feature of DSs [*developmental states*] is that they are primarily concerned with the structural transformation of modernizing economies" (Swilling, Musango, and Wakeford 2016). The legitimation of these states towards their own population largely comes from their apparent ability to provide growth and development. For that, concern for development is not enough, and these states have to show several abilities. For Swilling et al., developmental states should show that they can, amongst other "generate and implement national and sectoral plans", "manipulate private access to scarce resources", "manage interest groups through state corporatism", "resist political pressure from popular forces and, at times, also brutally suppressing them" (Swilling et al. 2016). These abilities come through structures, which according to Routley include a dedicated bureaucracy, political leadership and a "close (…) relationship between some state agencies and key industrial capitalists" (Routley 2012).

The Indonesian state can in many ways be considered as an example of developmental state, as it share many of the points developed ahead: part of the global south, it inherited an extractive economic system from the Dutch colonial era (Gellert 2010). The state is considered as having a decisive role in enabling development, especially in laying out infrastructures (Warburton 2018). Energy infrastructures, specifically coal are framed as "as an enabler of development and an engine of economic growth", at the centre of a governmental strong focus (Atteridge et al. 2018). The electricity governance is directed by dedicated state agencies: the Ministry of Energy and Mineral Resources (MEMR) and the national electricity company. These actors' actions are directed by plans and strong

cooperation exist between ministries, SOE, and capitalists in the fields of coal extraction and electricity generation.

In the developmental state perspective though, environmental issues are seen as secondary, if not simply as barriers to development. This is not only the case of the developmental states themselves, but also of the vast majority of the literature dedicated to their studies. Indeed, this literature is largely prescriptive, trying to discriminate between 'good' and 'bad' state practices, where economic development is considered as a goal and active state intervention a privileged tool for reaching that goal (Routley 2012). That is why this thesis uses a critical approach of the notion of Developmental State, based on the 2016 work of Swilling et al., completing and questioning developmental state literature using concepts of sustainability transition, part of the field of political ecology (Swilling et al. 2016).

3. Methodology

To answer the research questions, qualitative data collection methods have been used. A systematic literature review has allowed to get a theoretical basis to use for the thesis, and background information on the topic. Once the saturation point of literature review started appearing, expert and stakeholder interviews were used to get more specific information about structures and processes as well as analyses that has not been published.

3.1. Literature review

The specific case of the Chinese coal ban being quite recent, only a handful of scholars have already published about the topic as of 2023, these publications mostly happening outside of peer-reviewed processes. Such scholars include Christoph Nedopil, from Fudan University and Cecilia Han Springer, from Boston University, both political economy scholars with a strong focus on Chinese finance and environment, the first one working mostly on development finance, and the latter working mostly on coal-related policy. To make up for that lack, a focus has been put on literature on related topics such as electricity development and governance in Indonesia; or the Belt and Road Initiative (BRI) and Chinese investment in electricity abroad. Theoretical literature, as presented in the theoretical framework has also been an important source.

The bulk of the literature review has however been on non-peer-reviewed literature, as they present the great advantage of having significantly lower timespans before publication. This very broad set of literature completed the theoretical basis and data acquired through academic literature review, as well as being a key basis for preparing the next step: the interview. Grey literature from research-focused NGO and international organisations has specifically been an very important source of data and analysis on the latest development in the Indonesian electricity governance and on the Chinese decision. Most NGOs which reports have been used are international, such as the Centre for Research on Energy and Clean Air (CREA), the Stockholm Environmental Institute (SEI), the International Institute for Sustainable Development (IISD), the World Resource Institute (WRI), the Global Energy Monitor (GEM), Ember, or Climate Action Tracker (CAT). The distinction between scholars and NGOs is however not clear cut, with active collaboration between scholars and NGOs, which can take the form of commonly written reports or articles. Most of the literature on the Chinese decision comes from such reports, as well as much investment trends analysis, Chinese and Indonesian policy analysis, power plant data

Newspaper articles, specifically specialised environmental medias such as Mongabay and Carbon Brief have also been used; as well as specialised Chinese industrial medias such as Seetao or power.in-en, publishing brief news about contracts and other company evolutions. Official documents such as regulations and plans have also been an important source of information, even if this type of document has to be read critically, reality on the ground being often very different. They all have been used to verify claims made by the literature and by interviewees, or getting information on very recent evolution.

3.2. Expert and stakeholder interviews

Experts and stakeholders have been contacted, and semi-structured interviews conducted. Semi-structured interview give more space for the actors to express their vision. It can be easier to question preconceptions of the author and collect valuable data than through the use of questionnaires, for example. Given the variety of profiles that were planned on being interviewed, a fully structured

interview seemed also less interesting. The primary goal of these interviews being to try completing the literature review with insight on the functioning of institutions and on the process that have not been reported by the press, a fully structured interview would not have allowed such adaptation.

Two methods have been used for the sampling: direct contact with the interviewee, via Email, Whatsapp or Linkedin (Interviewees n°1, 2, 4, 5, 7). One note is that interviews n°1,2 and 4 all have been obtained after recommendation from people studying or working at the WUR. Snowballing has also been important. After each interview, contact of possible new interviewees have been asked. Through interviewee 1, it has been possible to get in touch with interviewee 3, and through him with interviewee 6.

All the interviews have been done online via videocall, between the 15th of march and the 18th of April. They all have been recorded and the data later transcribed from this recording. When possible, later exchanges have been made to obtain more documents or get precisions on certain topics. Because of the requirement of many interviewees to be anonymous, choice has been made to anonymise all the interviewees' names as well as their organisations, except for the ASEAN Centre for Energy.

Most interviewees have been done personally and one-to-one, with two exceptions. Interview n°5, which has been conducted with two interviewees by fellow student Dai Jincheng, also writing his thesis on the Chinese coal ban. And interview n°7, conducted by myself and Dai Jincheng, with two interviewees again. Each interview lasted between 1 hour and 1 hour 30, except for interview n°4, which lasted 40 minutes. Because of the richness of the conversation and limited time, interviewee n°4 has been interviewed twice: in interview n°4 and interview n°8.

Table n°1: List of interviewees

Interviewee n°	Organisation	Interview date	Interviewer
N°1	Indonesian NGO	15-03-2022	Author
N°2	ASEAN Centre for Energy	16-03-2022	Author
N°3	Indonesian NGO	23-03-2022	Author
N°4	Indonesian NGO	24-03-2022 & 18-04-2022	Author
N°5a and N°5b	International NGO	23-03-2022	Dai Jincheng
N°6	Indonesian NGO	08-04-2022	Author
N°7a and N°7b	International NGO	14-04-2022	Author & Dai Jincheng

4. 15 years of coal-based developmentalism in the electricity system

This chapter will attempt at answer the first study question: *What are the political and economic conditions that have led to coal-electricity surge in Indonesia?*

Indonesia's developmentalism led to a vast increase of greenhouse gases emissions in the last years, of which a significant portion comes from its newly expended electricity system. The choice of coal for its main source of electricity led Indonesia to an ever-expanding carbon lock-in which needs to be addressed if the country wants to achieve carbon reduction compatible with the Paris agreement.

Coal has been chosen as a basis for electricity development in Indonesia, because this resource serves the interests of the state, its different agencies and of the country's economic and political elite. The processes of coal extraction expansion and of coal electricity generalisation has itself strengthened a coal elite which controls key positions in the Indonesian state and energy governance, and is now even more able to push the state to protect its interests. Widespread installation of coal power plants is a decision made at the country level, but it would not have been possible without massive financing and construction services coming from foreign countries, including from China.

4.1. A conscious state decision for coal-based development

4.1.1. Coal electricity for development

Indonesian government has been putting a priority on infrastructure in its developmental strategy, expanding the electricity system being a key element of that strategy.

In Indonesia, the infrastructural system is thought as a basis for economic development and alleviation of poverty, and is put at the centre of national progress (Tritto 2021). Considering the importance of this narrative around progress, most of the successive governments' popularity and electoral successes depends on it in the country (Ordonez et al. 2021). In that context, several ambitious electrical capacity expansion projects have been put forth in the last decades, which result on electricity generation can be seen in figure 1 (Ordonez et al. 2021). Current president Joko Widodo's (also called Jokowi) administration is no exception, and has even been described as having a much stronger focus on infrastructure development that its predecessors (Warburton 2018). In the electricity field, his administration developed the very ambitious 35GW plan, inheriting from previous president Susilo Bambang Yudhoyono (SBY)'s two 15GW fast-track programs. As a result, capacity installed grew from 48.4 to 76.3GW from 2013 to 2022, a 58% increase in ten year, according to *Perusahaan Listrik Negara* (PLN), Indonesian public electricity company (Statista 2022). Most of this capacity increase has been coal-powered, and now an estimated 49-66% of the generated power came from coal in 2020, depending on the sources (Statista 2022). From a fossil-rich but modest electricity mix, Indonesia went to a 85% fossil-based, much larger and ever increasing electricity production (Statista 2022).

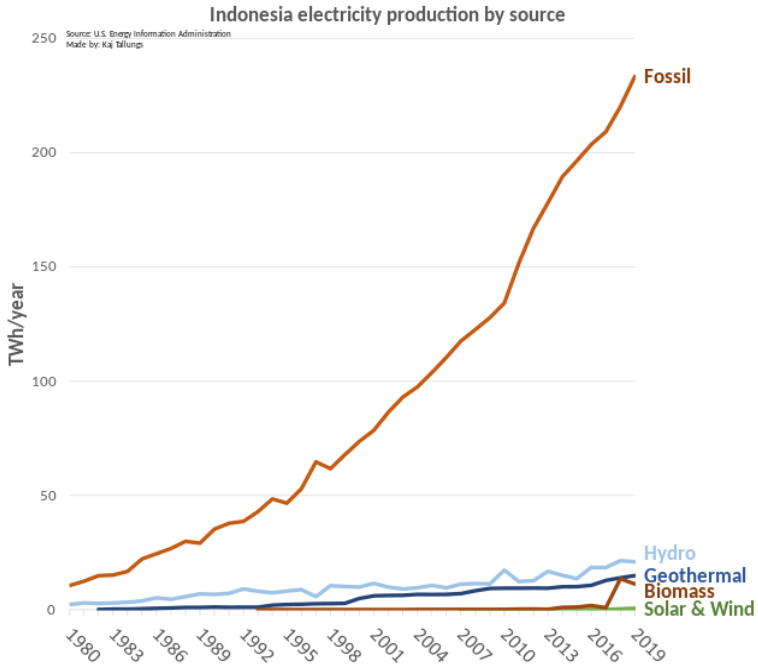


Figure 1: Indonesian electricity production by source 1980-2019 Source: Wikipedia, US Energy Information Administration

4.1.2. A state electricity monopoly with interests vested in coal

This choice of coal over other electricity sources can be explained by state and energy structures and goals. The Indonesian state and its administrations are widely described as having interests vested in coal, which has implication on the way coal has been favoured compared to other energy sources.

The developmental goals of the Indonesian state in the electricity sector are very well served by coal, framed by the government as an "enabler of development" (Atteridge et al. 2018). One of the main goals of Indonesia's 35GW plan was to provide universal access to electricity, in order to "reduce poverty, promote industrialization [*and*] create domestic value added" (Ordonez et al. 2021).

Considering the goal of tackling energy poverty, price is a major factor in energy source choice in Indonesia (Tritto 2021), and claimed so by the government (Woods 2017). Coal is a generally cheap energy, as long as the negative externalities (deforestation, air pollution, greenhouse gas emissions, etc.) are not taken into account (Atteridge et al. 2018). In Indonesia, several measures increase this effect and lock state actors into treating coal as an artificially cheap resource. A price cap on coal way below international market prices is imposed on a certain amount of domestic usage since 2009, to ensure low energy prices since the end of direct electricity subsidies (Atteridge et al. 2018; Ordonez et al. 2021). This makes coal largely safe from international market evolution, and its price can be predicted to stay low on the long term. This low price and long term visibility increase the incentive for PLN to use that resource.

Indeed, another important objective of Indonesian energy strategies since the 2000s is energy security, considered by some researchers as a type of *resource nationalism*, very present in the country (Ordonez et al. 2021). PLN's development of coal assets in the 2000s was a way to get rid of reliance on diesel generators (Gunningham 2013). Indonesia is a coal-rich country, when its gas and oil resources have been largely depleted and now have to be imported (Gunningham 2013). This means

their good distribution depends on the volatility of the international market, which does not give visibility on the long term for the ability to secure good access.

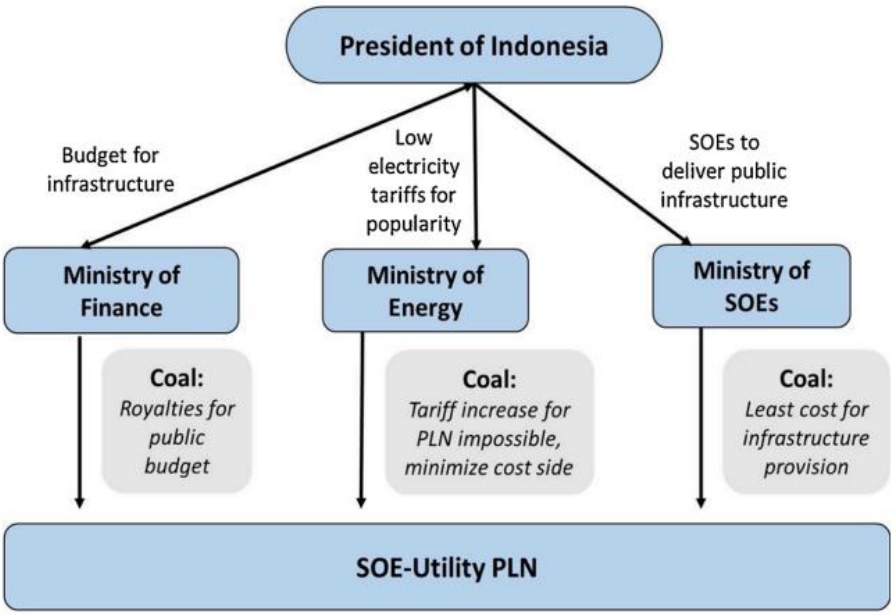


Figure 2 Schematic overview of actors and incentives leading to coal development
Source: Ordonez et al. 2021

Coal serves the development goals of the state as whole, but also the interests of its different organs. The electricity governance is mostly state-owned, and there is an interconnection between the interests of its actors and of the coal industry actors. These interconnections can explain why coal has be favoured and why they would have a lot to lose if it would be abandoned for environmental reasons.

A flagrant example of this interconnection is the ministry in charge of the energy governance. The ministry of energy and mineral resources (MEMR) has been created in 1978, putting under the authority of one minister the issues of energy production and resource extraction, including coal. For the SEI, this union "reinforce[-*d*] a strong link between coal production and the country's energy policy" (Atteridge et al. 2018). Indeed, MEMR has assets all along the electricity production line. It supervises PLN, the national electricity company, but also one of the biggest coal mining company of the country, through its holding MIND ID: Bukit Asam. It is in this ministry's interest to let its different SOEs complement each other, for example by having PLN be a client for its mining companies. This link is noticeable in the ministry's output, such as its two plans that include electricity development: The National Development Plan and the National Energy Plan. These plans have been known for picturing very ambitious capacity expansion and giving coal an important share in them. For instance, the National Development Plan for 2015-2019 planned almost 20GW increase in coal capacity for the 35GW project (Atteridge et al. 2018).

Indonesian electricity system works as a state monopoly, with Perusahaan Listrik Negara (PLN) its national electricity company. Owned by the ministry of state-owned enterprises (MSOE), it is also supervised by two other ministries: the ministry of energy and mineral resources MEMR and the ministry of finance (MoF). This company has monopoly on the national grids, and on electricity purchase and sale. It does not, however, have monopoly on electricity production. While in fact most of the electricity is produced by PLN and its subsidiaries, independent power producers (IPP) also exist,

and have been growing since the last decade's electrical development plans. They need for that to have a contract with PLN, and sell their electricity to the company.

PLN itself is considered favourable to coal for many reasons and has a lot to lose in the event of a diminishing coal industry. PLN also is pressured by the government to produce low-price electricity and required to return profit (Atteridge et al. 2018), and will therefore choose cheaper sources. Because of the price cap on coal, PLN is incentivised to choose coal over other energy sources, this cap is working like a coal subsidy (Ordonez et al. 2021). Now that it has massively developed around coal in the last decades, PLN as a power producer has an interest in keeping its multiple young coal-fired power plant (CFPP) assets open as long as possible. As the state monopoly for electricity distribution, it has contracts signed with IPPs, with a 'take or pay' policy. It means that if the electricity is not sold, it will still have to pay it to the IPP (5-intA and 5-intB 2023; Andri Prasetiyo et al. 2023). It provides an incentive for PLN to use IPPs coal electricity as intensively and as long as possible. Considering many of these power plants have been built in the 2010s, PLN has no interest in decarbonising existing electricity for the next few decades.

Bukit Asam, PLN and many other industrial SOEs consuming coal and electricity have a lot to lose if coal use were to diminish, and the state has interests in keeping healthy these assets. If these companies suffer from losses because of a decrease in coal use, it would lose its 'export, levies and royalty' revenue it receives from them (4-ind 2023a), have to pay for their deficit (6-ind 2023) and ultimately have its international investment grading reduced (4-ind 2023a). The state is now engaged in a coal lock-in which has an effect on its current and future carbon emissions.

4.2. Interpenetration of state and extractive capitalists' interests

The choice of coal over other primary energy sources is not only explainable in terms of state interests and developmental constraints, but also in its relationship with key coal industry capitalists, a defining trait of developmental states. Choices have been made by the state to favour the private interest of that industry, even when its detrimental environmental, social and health effects were very much known. The exploitation and use of coal is indeed related to much corruption, described as extremely present in the Indonesian state, while regulations are weak (Atteridge et al. 2018).

Coal extraction is a fairly recent sector in Indonesia, which started gaining importance in the 1990s. Indeed between 1989 and the 2010s, annual coal extraction have been multiplied by more than a hundred, according to the Stockholm Environmental Institute (SEI) (Atteridge et al. 2018). In this process, coal extraction became an important and oligopolistic sector with several big private players, such as Adaro, Bumi Resources or TBS Energy. One of the biggest, Adaro, was responsible for the extraction of 53MT of coal (rebranded "envirocoal" by the company) in 2021 (Adaro Energy 2022), approximately 10% of domestic production. For a long time, coal was almost entirely exported and 80% of the annual production was still exported in 2018 (Atteridge et al. 2018).

But this market showed insecurity in the 2010s, and these powerful coal companies lobbied to secure their future within the country (Atteridge et al. 2018; Ordonez et al. 2021). The two 15GW fast-tracks an the 35GW plan have been a great opportunity for the coal extraction industry to create a domestic demand (Atteridge et al. 2018; Ordonez et al. 2021; Woods 2017). It also allowed them to expand their activities throughout the whole coal supply chain by becoming IPPs. Those private companies have strong commercial ties with the state, being suppliers of coal to plants owned by PLN and of electricity to its grid via their private power plants.

The private coal sector also has its interests represented at the head of the state via key figures of public energy governance. Figures from the extractive industry, and more specifically from the fossil industry, are present at many key positions of the state (4-ind 2023a). Luhut Binsar Pandjaitan, one of the most influential figures of the Indonesian state, is the Coordinating Minister for Maritime and Investment Affairs, which controls, amongst others, the MEMR. Luhut is also a businessman, and was the owner of TBS Energy until 2016, a company he is still believed to own it through a financial scheme (Costa 2023; Global Witness 2019). This company is present in the coal extraction and CFPP, but also in palm oil plantation, and electric vehicles (TBS Energi Utama 2023). These positions create conflicts of interests at the head of the state and facilitate the formulation of policies aiming at favouring the interests of these important industrial groups. The inclusion of private fossil interests in the policy making process has prevented the inclusion of low-carbon energies in the energy mix. This goes against the fact several interviewees consider Indonesia could base, or could have based at that time, most if not all of its electricity on renewables (4-ind 2023a; 6-ind 2023).

Yet, niches against coal and for the development of alternative energy exist, even if their influence seems limited according to much of the literature. Many instances of local resistance against installation of CFPPs have been described (Fünfgeld 2019; Tritto 2021; Zamzami 2017), while within the state structure, some departments are specialised in new and renewable energy. A wide array of environmental NGOs also exist, some working closely to the state, while some are in opposition with it (4-ind 2023a; Fünfgeld 2019). But the government and the state have been described as unresponsive to these movements and organisations by the SEI. For them, the Indonesian state is not considering "visions for socio-economic development or a future in which coal mining does not feature centrally", while the main opponents of coal did not have any "political influence" (Atteridge et al. 2018).

4.3. Role of Chinese and foreign actors in energy development

Foreign actors have been enablers of Indonesian energy development, providing with construction services and investments Indonesia did not have access to in such amounts. But as much as foreign companies and financial institutions have been key in enabling a coal-oriented electricity grid in Indonesia, they have been described as having less and less interest in this resource globally (Atteridge et al. 2018). China's role in CFPP installation however grew until the late 2010s, replacing actors from other countries.

Indonesian infrastructure projects, including coal and grid expansion ones, have been in need of foreign investors and construction companies (Tritto 2021). These companies and financial organisation are present in Indonesian energy sector in several manner: financial institutions, both public and private, provide fundings. For example, the World Bank has provided fundings for strengthening the grid, which has for a long time been a weak spot of the electricity system (Gunningham 2013). In the meantime, energy companies provide construction and/or operation services for power plants.

Contrary to coal mining, which is a more domestic industry, coal power plants have been heavily reliant on foreign investment because of the amount of capital needed to instal them (Tritto 2021). Since the first fast track program, Indonesia has been attracting significant regional investment from Korea, Japan, Malaysia, Singapore, Hong Kong and China (Tritto 2021). Chinese investments accelerated during the 2010s, as the country was unfolding its Belt and Road Initiative (BRI), and later after Jokowi's election as president. As part of its infrastructure development measure, Jokowi's

administration has been aiming at attracting foreign private investment. Economic reforms have been put in place to affect barriers against these investments, specifically bureaucratic ones (Ordonez et al. 2021). During that time, economic ties between China and Indonesia have grown significantly (Camba, Tritto, and Silaban 2020). As a result, Indonesia is the third biggest recipient of Chinese electricity investment worldwide, with 14GW installed between 2011 and 2022 with funds from policy banks (Global Development Policy Center n.d.) and China is the first investor in Indonesian electricity sector. Most of these policy banks investments are loans to PLN by Export-Import Bank of China (CHEXIM), and China Development Bank, the country's two policy banks. Some others are foreign direct investments (FDI) by a Chinese company owning a CFPP (Global Development Policy Center n.d.). Another public bank also plays an important role, The Bank of China (Tritto 2021).

But China is not only present in the form of investments, and its actor are even more present as engineering procurement and construction (EPC) companies, and/or as IPP. Such companies are most of the time major SOEs, such as China Huadian, China Energy, PowerChina or China Energy Engineering Corporation (CEEC) (Tritto 2021).

Companies present as EPC provide construction services to a power producer. The power plant can be directly built for the benefice of PLN, or of another power producer. They have been present since the first fast track program in 2006, and were at that time providing mostly cheap, low-end plants aside with Japanese and Korean companies. Chinese companies are also present as IPP. In that case, these companies have to sign a power procurement contract with PLN. Chinese companies are most often present as IPP as owner of plants they have built themselves. They can also be present after purchasing already existing IPP operating CFPP: for example, China Datang purchased DSS, an Indonesian IPP (Global Development Policy Center n.d.). Finally, companies from other industrial sectors are also important actors. Because of the high energy intensity of their sector, steel or aluminium groups such as Tsingshan are building captive power plants, that are not connected to the national grid but solely supplying energy to their factories (Tritto 2021).

Involvement Chinese companies is however in a declining trend since the end of the 2010s. According to Tritto, this Chinese involvement knew a peak in the 2013-2015 when on the one hand the World Bank and the European Investment Bank stopped investing in coal, replacing this lack of liquidity; and on the other hand, the BRI started, facilitating Chinese company activities in Asian countries (Bénazéraf et al. 2019; Tritto 2021). While many power plants whose contracts have been signed earlier are getting delivered in this period (Global Development Policy Center n.d.), the amount of new energy contracts with Chinese actors diminished steadily after the 2015 peak, mostly for investment (Tritto 2021). This happened a year after Indonesia launched its 35GW plan and 2 years before the government paused it because of oversupply issues. Indeed, the fast increase of power plants led to an overcapacity, which has led to a slow-down in Indonesian energy ambitions since 2017 (Woods 2017).

4.4. Conclusion: A state locked in a carbon-intensive pathway

Indonesia has been building its power infrastructure with a state-led developmentalism model, with significant help of foreign actors, including Chinese ones. Coal has been the most important resource of that process, a readily available technology which had existing financing and construction structures both within the country and in partner countries. Furthermore, coal was compatible with

the developmental goals of the state, of its administrations and SOEs, as well as of the economic and political elites. It provided energy security, cheap electricity necessary for tackling energy poverty issues, and supported economic interest of many actors of the industry and politics. In this process, the coal industry and the state have increased their already important ties. The changes that occurred in the electricity system are not neutral in terms of environmental impacts though. On local and national scale, coal extraction is responsible for much destruction of social and natural habitats, while burning of coal releases much pollutants into the air. On a global scale, this fast increase also has a great impact. Carbon dioxide emissions related to total energy production quadrupled in Indonesia since 1990 (Ordonez et al. 2021), and Indonesia is as of 2019 the fourth largest GHG emitter worldwide (Ritchie, Roser, and Rosado 2020). In this context, climate mitigation in the energy sector has started to be taken into account at the state level, leading, amongst others, to net-zero emission targets.

5. Net zero: a new developmental objective for Indonesia

This chapter will attempt at answering the second study question: *How is Indonesia envisioning its net-zero pathway for the electricity sector?*

In this national context extremely favourable to coal, a net-zero emission (NZE) discourse has been on the rise since the late 2010s and is heralded by key figures of the energy governance. But at the same time, it is apparent that the situation on the ground is far from being favourable for electricity sector decarbonisation at the moment. Solar and wind are virtually inexistent niches in current mix and only one new renewable project with a significant capacity is reported by Int-2 (2-ase 2023; Masdar n.d.). A series of systemic obstacles against decarbonisation exist, and can partly explain this discrepancy between the announced goals and the reality on the terrain.

Policy have been made by the state to promote energy transition. These reforms are however for the moment unable to result in structural transformations of the energy system and of the interest structure, jeopardising their chances of success. Meanwhile, net-zero targets and plans have been set by multiple state organisations, seemingly getting more and more ambitious and giving a dominant position to solar panels in future development, signal of a transformation of the state's consideration of key technologies for energy development.

Many of the interior barriers seem difficult to overcome without external help, according to interviewees. For that reason, most of their hope for the completion of net-zero comes from cooperation with foreign entities. As much as foreign partnerships and investments have been able to foster coal-based developmentalism in the 2000s and 2010s, the state is looking for foreign actors to facilitate its solar-based developmentalism for the 2020s-2060 period. Foreign actors indeed have much resources to provide: investments, policy support and capacity building.

5.1. A developmental strategy with many barriers to face

5.1.1. The generalisation of a discourse for net-zero emissions

The idea of a climate action specific to the energy sector is not new in Indonesia. According to interviewee n°4, it dates back to 2007, when Indonesia was host of the UNFCCC COP13 and then-president Susilo Bambang Yudhoyono (SBY) wanted to spread the image of Indonesia having "climate leadership" and him being a "visionary leader" (4-ind 2023a). Measures at that time included setting a target of 23% renewable share in the total energy mix by 2025. But the prospect of a low-carbon energy development did not happen at that time as Indonesia made the choice of basing its energy development on coal in the following 15 years.

A narrative in favour of energy sector climate action has intensified in the recent years, with the new objective of net-zero GHG emissions(2-ase 2023; 4-ind 2023a). Reason for these recent changes are explained by interviewees in terms of international situation changing for energy sources, and a somewhat receptive elite at the head of the state. For interviewee n°2, the reason behind the government pushing for energy transition is because "the world is going that way" and top officials want Indonesia to be seen as a "green country" (2-ase 2023), motivations that would be then very similar to SBY's unfollowed pledges. For interviewee n°4, the change comes from the head of the state. The coordinating minister for maritime and investment affairs Luhut Pandjaitan "single-handedly mainstreamed the political narrative within the bureaucracy" of net-zero. According to her, Luhut Binsar Pandjaitan wants to diversify its company incomes as the safety of the coal business appears to be diminishing (4-ind 2023b). In that regard, the new setting of net-zero developmental targets corresponds to one of the elements of Swilling et al.'s development state framework. It is a

management of some of the country's key capitalists' new interest by state corporatism, manipulating the state's demand in energy to secure new markets for its extractive elite (Swilling et al. 2016).

This narrative is now followed by different organs of the government. For several interviewees, this narrative has spread through hierarchical structures, with the ministries placed under the supervision of the coordinating ministry for maritime and investment affairs being at the core of this change (2-ase 2023; 4-ind 2023b). Different ministries and SOE are described as having diverging levels of responsiveness to this new incentive though, depending on their direct interests, goals or their hierarchical situation. Ministries under the umbrella of the Coordinating Ministry for Maritime and Investment Affairs includes the Ministry of Energy and Mineral Resources (MEMR). According to interviewee n°4, the MEMR has many units, such as the electricity unit, which are now in favour of energy transition. The reason would be because new coal-fired power plant (CFPP) financing is now too rare and expensive (4-ind 2023b), which adds up to already volatile and increasing price of coal on international markets. At the same time, renewable energies are getting cheaper globally, which makes them potentially compatible with that unit's main task, to ensure low prices and universal access for electricity (4-ind 2023b). The prospect of an energy transition into renewables, because of technical advancements and an international situation unfavourable to coal, is then starting to be compatible with some core interests of the ministry.

Other institutions also start considering addition of new renewables as part of their interests, although it does not mean are they in favour of a fossil phase-out, or even of stopping fossil expansion. For Interviewee n°4, the ministry of finance is in favour of reducing the dependency to fossil fuels. In the 2010s, energy subsidy reforms have indeed been the opportunity for the government to reduce financial pressure and redirect funds towards infrastructure construction and for PLN to develop on cheap coal (Ordonez et al. 2021). However, the coal price cap is become very expensive as fossil fuel prices are going up, but is very difficult to get rid of, for political and electoral reasons. According to the interviewee, 'the interim solution is to forge ahead with energy transition in any way possible' (4-ind 2023b). Replacing coal with renewables can indeed be a way of reducing the use of fossil fuels and hence the costs of their subsidies. A phaseout of coal would although be detrimental for the state revenues, because of the diminution in taxes and royalties. A decrease in coal consumption or exploitation without new revenues would be against the interests of the ministry of finance.

5.1.2. Persisting administrative barriers within the state

The shift towards net-zero emissions objectives seems to be including photovoltaic (PV) panels as a new technology at the core of Indonesia's development strategy. However, there still are many barriers for the inclusion of that technology, and many more for the complete replacement of fossil fuels by low-carbon technologies. Indeed, many states and industrial interests still have their interests mainly vested in coal and are still opposed to those two processes. It results in regulations, or bureaucratic barriers that are orienting markets in favour of coal and in disfavour of low-carbon energies and are protected by these actors.

Many of these barriers are centred around PLN. The company's interests and its monopolistic position are considered as a major barrier to installation of low-carbon energy by many interviewees (1-ind 2023; 2-ase 2023; 3-ind 2023; 6-ind 2023). Even if the SOE has fallen in line with the NZE narrative, shelving a significant number of planned CFPP and including significant take-up of "new" and renewable energies in its plans, little effort for the deployment of renewables have been done (3-ind 2023). For that reason, a lot of hope on that side comes from Independent Power Producers (IPP), believed to have more interests in developing these energies (3-ind 2023). But PLN is described as

putting barriers to foster its interests and deter its competitors on several level. On the level of connection with the grid, IPPs have to sign a contract with PLN. Many rules apply, including some which are not publicly accessible and are specifically intended for renewables (6-ind 2023). Because of its dominant position, PLN is described as being able to set the price, which can be used in favour of or against certain actors (1-ind 2023; 2-ase 2023). For interviewee n°3, these barriers exist to only allow companies close to the government to pass (3-ind 2023). On the production level, specific import limitation rules apply to PV. A certain amount of the PVs' elements installed in Indonesia have to be manufactured in the country. This protectionist rule aimed at strengthening a nascent national production is widely considered as a barrier by interviewees (1-ind 2023; 2-ase 2023; 3-ind 2023; 6-ind 2023), which confuses IPPs (1-ind 2023) and increases renewable costs in Indonesia(2-ase 2023). For interviewee n°6, PLN is intentionally maintaining these bureaucratic complexities as a way to increase its revenues (6-ind 2023).

These administrative barriers against renewable energies lead to many hidden costs for these energies. Meanwhile, coal is benefiting from favourable conditions keeping its price down and that can be considered as fossil fuel subsidies (1-ind 2023; 2-ase 2023; 3-ind 2023; 4-ind 2023b). Both affect the competitiveness of renewable energies in the country, although on a global level, renewable energies are now mostly below grid parity. This is specifically important considering price is a decisive element in energy choice decision in Indonesia, as seen in 4.1.2.. For that reason, price is one of the main barriers to the development of renewable energy cited by many interviewees (1-ind 2023; 2-ase 2023; 3-ind 2023). Investments in the sector are also affected by these barriers, as they create risk and uncertainty, and make economic feasibility very low. Investors, private, public, local or international ones are all hesitant, and financing of decarbonisation is still the "*black sheep* of financing" for Interviewee n°3, despite governmental efforts in that direction (3-ind 2023). Meanwhile, domestic financing of fossil fuels is still high. Domestic banks are reportedly "slowly moving fossil fuels sector out of their portfolio", and three of the biggest banks promised end funding of fossil fuels (3-ind 2023). But loopholes make these pledges ineffective, and coal mining was still attracting more investments in 2022 (Jong 2022c).

5.2. Limited reforms and plans

5.2.1. A set of reforms that fails to address structural barriers

As a result of those contradicted interests, some policy has been adopted since the late 2010s to facilitate renewable energy take-up and help achieve NZE. But these policies have been for the moment quite limited and unable to affect structural barriers, while proposed structural reforms struggle to be implemented. The connection between the political elite and the coal industry remains untouched, as well as the whole electricity governance structure and the interests of its actors.

One of the most important policies on the electricity sector of the last years has been the Presidential Regulation n°112/2022. This regulation has, amongst others, officialised a diminished no new coal power plant policy, to be implemented once the 35GW project will be finished (2-ase 2023; Andri Prasetiyo et al. 2023; Jong 2021). Although this policy seems ambitious, it is actually very limited by the fact it does not include any of the current coal power plants projects where the state has specific interest. The amount of power plant still to be built according to the 35GW plan is very large, above 13GW, but also because it does not include captive coal power plants (Andri Prasetiyo et al. 2023). It also introduces a legal framework to CFPP early retirement, a much needed policy for breaking away from carbon lock-in. A reform of tariffs for renewables is also part of the law, aiming at making feed-in

tariffs more interesting for IPPs. Yet, many interrogations remained on how these changes would be enacted and how much they would make renewable energy take up easier (ABNR law 2022).

More ambitious reforms have been proposed, to address some of the key barriers against decarbonisation. The role of PLN could be affected, as well as other administrative barriers that make low-carbon energies less competitive. But they face resistance as they are clashing with some developmental goals and/or with the interests of powerful actors, and their adoption process is slow and full of uncertainty. One of them is a proposed comprehensive "New and Renewable Energy Bill" (or RUU EBT), which has been under discussion for several years now, and which vote has been several times delayed (Ahmad Fikri Noor 2023b). This bill would facilitate the installation of renewables and "new" energies, by acting on the many barriers against them. It is however very controversial for several issues, as its definition of "new" energy is very broad and would include many coal-based technologies (Sulaiman and Widianto 2022). It would also accelerate the liberalisation of the electricity sector, by allowing IPPs to directly sell their electricity to consumers (Ahmad Fikri Noor 2023a). The RUU EBT is considering liberalisation of the electricity selling as part as a controversy around PLN's monopoly, considered as a massive barrier against decarbonisation. But at the same time, this SOE is considered as a cornerstone of Indonesian developmentalism, and weakening state monopoly is not universally acclaimed in the governance system (Ahmad Fikri Noor 2023a).

Many interviewees call for ambitious policy in this direction of structural economic reforms, with elements that can be found in proposed or shelved policies. Some examples are: extensive subsidy system reforms, away from coal and into renewables through tax breaks or other installation help (1-ind 2023), the establishment of a carbon emission trading system (1-ind 2023; 3-ind 2023), or even more radical: a full opening of the electricity production to the market and private companies (1-ind 2023). Int-3 mentions many creative internal instruments to provide financing for renewable energy and/or make fossil energy more expensive, such as carbon tax, green bonds, commercial bonds, green sukuk (3-ind 2023). But the state is locked in coal energy structurally. For interviewee n°6, decarbonisation of the electricity sector would require to deeply reorganise every administration at once and promote collaboration between different governmental organisms, an extremely high threshold for success (6-ind 2023). Furthermore, these measures would go against the state's conception of developmentalism and coal-vested interests, which are many reasons that explains the fact they are not believed to be easily happening (1-ind 2023; 2-ase 2023; 3-ind 2023; 4-ind 2023a; 6-ind 2023).

5.2.2. Plans: a crucial tool to make NZE targets reality

Targets, goals and plans have also been set, with an increase in ambitions since 2021, as the net-zero narrative was spreading throughout ministries. As part of the Paris Agreement, Indonesia committed to reduce its total GHG emissions increase by 29% below its unabated baseline by 2030 (Bridle et al. 2019), a pledge counterintuitively meaning an increase of the emissions. To substantiate this pledge, the government has set targets such as a 23% share of renewables in the total energy mix by 2025, a target far from being attained in 2022 (Reuters 2022). In 2022, new Nationally Determined Contributions have been published, without much change. They are to this date seen as critically insufficient by Climate Action Tracker (CAT 2022). Since 2021, more ambitious targets have been set within the country, as Net-Zero Emissions (NZE) targets. There is however not one central target, and different ones have been set by agencies, with different dates and modalities. For PLN and the MEMR, the target is of 2060, while the from the Ministry of Environment and Forestry is of 2070 (Andri Prasetiyo et al. 2023).

Plans an important part of the governance of Indonesia's largely state-owned electricity system, supposed to set the route for the future of electricity developmental strategy. These plans in the early 2020s have evolved greatly, under the pressure of net-zero rhetoric and now include a growing amount of renewables in their future mix, although important differences exist between them.

One of the most important results of NZE targets is PLN's 2021-2030 RUPTL plan, which has been presented as the "greenest" plan from the SOE so far. Indeed, out of the 80GW electrical capacity that ought to be added in that 9-years period, with just over 50% are supposed to be renewables, with way less coal capacity planned to be added, compared to previous plans (Erwida Maulia 2021; Tam, Faroy, and Batih 2021). While that type of plan is compatible with an ill-defined energy transition, it still pictures a rapid expansion of coal, with another 14GW capacity being added during the decade (Tam et al. 2021). This plan also pictures CFPP to be equipped with Carbon Capture, Utilisation and Storage (CCUS) to reduce the GHG emissions, although this technique is expensive, energy intensive and its efficiency unproven (Andri Prasetiyo et al. 2023). It has been reported that pressure has been put on PLN for its next plan to have a stronger and faster path towards net-zero (3-ind 2023; Andri Prasetiyo et al. 2023).

Sign of a very rapidly evolving situation and/or of a contradiction between organisations, this recent plan is in contradiction with the MEMR's roadmap for the energy sector, published in partnership with the IEA in September 2022 (Agung Pribadi 2022). As shown in Figure 2, MEMR NZE 2060 plan envisions a dramatic increase of installed capacity until 2060, mostly powered by solar panel installation (Gigih Udi Atmo 2023).

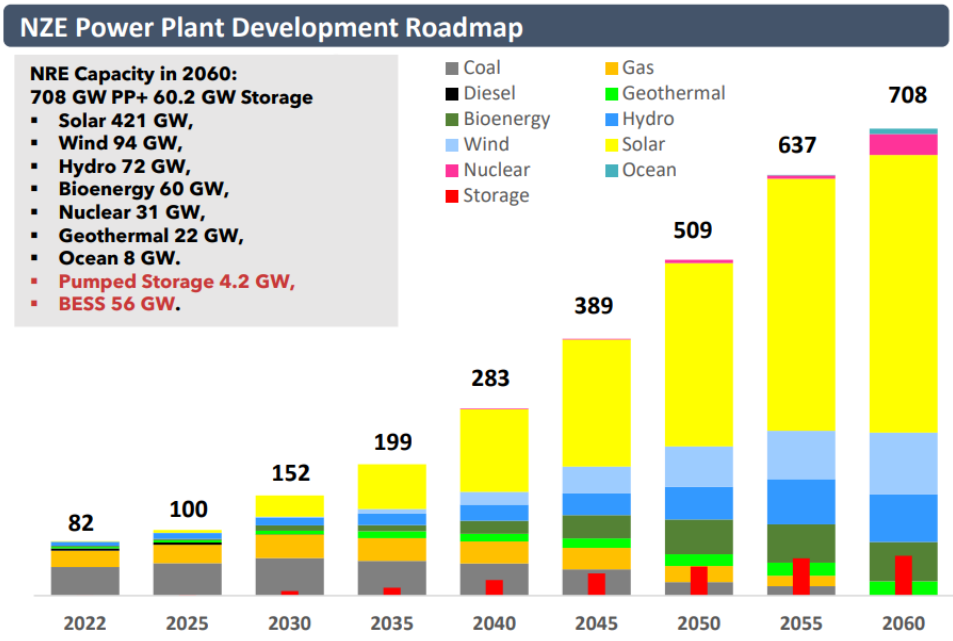


Figure 3: NZE Power Plant Development Roadmap by the MEMR, Source: Gigih Udi Atmo (2023)

While more ambitious than the previous policies and plans, this plan has many issues and is hence noted "insufficient" by the Carbon Action Tracker (CAT 2022). Coal phase-out would happen after 2055, and the coal capacity would even grow in the 2020s, before remaining largely stable in the 2040s. This, as well as gas increase are not compatible with the Paris agreement goal of 1.5°C (CAT 2022). It can also be noted that in order to sustain a multiplication by 8.5 of the installed capacity, it is envisioned to install 60GW of bioenergy capacity. Outside of electricity generation, it is also planned on becoming a cornerstone of the energy sector (IEA and MEMR 2022). This is an issue as biofuels are

a major source of deforestation in Indonesia and are seen as a risk for biodiversity loss (1-ind 2023; 3-ind 2023). Even when ambitious developmental goals are reframed to be compatible with net-zero, there are contradictions between these goals and environmental ones.

Even though the net-zero plans are not complete or universal, the situation appears significantly different from the one described by the SEI in 2018, seemingly highly hostile to electricity decarbonisation. It can no longer be said that "visions for socio-economic development or a future in which coal mining does not feature centrally", or that opponents to coal do not have any "political influence" (Atteridge et al. 2018). However, the influence of these opponents cannot be overestimated, as the inability to achieve structural reforms against the barriers to decarbonisation could be seriously putting at risk the implementation of these plans.

5.3. Helpful cooperations with international actors

Domestic barriers against decarbonisation of the electricity sector are complex, as existing regulations, structural interests of political and industrial actors and national financial and technological activities are all aligned with the coal industry. Interviewed NGOs acknowledge this issue and have little hope for actual effort and reform to be achieved from within the country itself. For that reason, much hope comes from establishing cooperation with international actors in the field of energy sector decarbonisation. These actors indeed have access to many resources Indonesia lacks for tackling these issues: financing, but also capacity building and policy support (6-ind 2023).

5.3.1. Bilateral or plurilateral processes that bring financial resources

Financing is a precious and relatively scarce resource for the energy transition, which bilateral processes can help provide. The government considers that one of its main roles in energy transition is to attract this resource into the country, much like attracting foreign investments was key for the coal-based development of the 2010s. A lot of effort is put in that direction (6-ind 2023), and the government is communicating heavily on it. For instance, Indonesia mentioned at the COP26 the possibility to phase-out of coal as early as 2040, provided sufficient international funding were secured (Reuters 2021). International finance, until recently seen as an unlocking possibility for carbon-intensive development and climate change, could have in that perspective the ability to help get rid of the CFPP it once helped build and replace them with low-carbon alternatives.

One result of Indonesian efforts and of some changing patterns in international finance, a Just Energy Transition Partnership (or JETP) has been signed between western countries and Indonesia. JETPs are financing cooperation mechanism to help coal-dependant economies phase it down, in favour of renewables (Government of the Republic of Indonesia and International Partners Group 2022). Announced at the COP26, the first beneficiary country was South Africa, then followed by India, Vietnam, Senegal and Indonesia. The investors and donors are G7 countries, alongside with Denmark, Norway and international financial institutions and private banks, organised in an 'International Partnership Group'. However, all of the banks involved in the project but one were at the same time in the top forty biggest fossil fuel investors globally between 2016 and 2022. One of them, Citi, is even second on that list; and one, Bank of America, fourth (Bloomberg et al. 2022; Merleaux et al. 2023). Participation in this partnership should not be mistakenly interpreted as a sign of climate engagement from these private actors, but can be thought of as a business opportunity brought by, and facilitated by states (Martin 2023).

One major element of JETP is the financing of energy transition that includes renewable energies, but also CFPP early retirement and grid and storage update. Large funds would be made available for PLN to close a significant amount of its coal power plants years or decades before their planned shut-down. This money would allow PLN to break away from the young power plants lock-in, and replace them with low-carbon electricity, with limited costs. Grid and storage update are also essential, considering photovoltaics (PV) and windmills are intermittent energies, which need way more flexible grids than dispatchable energies. For Indonesia alone, the goal is to secure 20B$ of blended finance, 50% of financing being public, the rest private, in the form of loans and grants (Kramer 2022). These figures have to be put in comparisons to the 100B$/year promised by developed country at the COP15 and COP26 for developing countries, for every matter related to mitigation and adaptation (Timperley 2021). Indeed, here, the promised values seem way closer from being secured, and apply to one specific subsector, to one country (6-ind 2023). The potential for concrete change are thus way bigger on that specific case. Sign of its perceived importance, this plurilateral partnership has been mentioned by all interviewees, and during 6 interviews out of 8, explicit mentions of enthusiasm have been made by interviewees (1-ind 2023; 2-ase 2023; 3-ind 2023; 4-ind 2023a, 2023b; 6-ind 2023).

JETP is not the only example of international finance mechanisms to help CFPP early retirement. While with way less means (Andri Prasetiyo et al. 2023), Asian Development Bank (ADB) proposes an Energy Transition Mechanism (ETM) which also includes early retirement. For the moment, at least one CFPP seems to be concerned, the Pelabuhan Ratu coal-fired station (PTBA Team Jakarta 2022). The World Bank's Climate Investment Fund (CIF) also has its own early retirement mechanism, the Accelerating Coal Transition (ACT). Once again, the funds and scope are lower for Indonesia. Along with three other countries, including two recipients of the JETP (South Africa, India and the Philippines), Indonesia would receive financing for early retirement of "up to 2GW of CFPP generation capacity", and an increase of "up to 400 megawatts (MW) of installed renewable energy" capacity (Climate Investment Funds 2022). Just like JETP, these plans are not fully set yet, and these figures are maximums.

5.3.2. A source of other, equally precious resources

Financing alone is however only one of the many elements needed to meet NZE plans, and that Indonesia, specifically the MEMR, is trying to secure (6-ind 2023). Bilateral agreements can also provide other resources to Indonesian to tackle barriers against decarbonisation. For interviewee 6, JETP is an example, amongst other, of the importance of bilateral (or here plurilateral) processes in concrete implementation of climate action. For him, these processes have many instruments to promote these concrete implementations, contrarily to multilateral. The ability to deliver big figures in terms of financing is one of these instruments, but not the only one. Capacity building, via direct technical cooperation between states is also very important, as well as policy support. That is why

Policy support can be of significant help to tackle one of the biggest issue mentioned by interviewees: bureaucratic processes. Decreasing the importance of this barrier could help tackle other one, such as the low feasibility of renewable projects. Ultimately, it could make renewable financing and installation more abundant. Policy support and policy reforms is a resource the Indonesian government is for the moment getting from partnership with the World Bank CIF's ACT (Climate Investment Funds 2022), the UK, Japan and Germany, according to Interviewee n°6. Considering there is little budget allocated to policy reform by the Indonesian government, he considers these partnerships as central, especially with Germany (6-ind 2023). Germany play a specific role through its developmental Agency *Deutsche Gesellschaft für Internationale Zusammenarbeit* (or GIZ), which provides financial help in the form of loans and donations, as well as policy and technical support (3-ind 2023).

Technology transfer and capacity building can be also a way to help tackling barriers to decarbonisation. It could lower the costs of renewable energy in the country, without having to rely fully on imported technology, an action that would be against its developmental and protectionist policy (2-ase 2023), and therefore could be a . Historically, lack of technology by Indonesia and other developing countries has been explain as one of the reasons many of them failed to base their development on low-carbon energies, getting locked in carbon-intensive pathways. Indeed in 2013, Gunningham argued that the lack of progress of renewables, including geothermal, was due to a low access to technology. A situation itself explained by the lack of international partnerships (Gunningham 2013). To ensure success of electricity sector decarbonisation, focus cannot solely be put on financial support, but should also take into account material and social conditions. The social aspect of energy transition and of capacity building specifically is also something taken into account in the texts establishing initiatives such as the ACT or the JETP. In order to avoid dire social repercussions on coal industry workers, these processes have the aim to support these workers transition to renewable energy jobs, although how exactly this would happen still appears unclear (Government of Indonesia 2022; Government of the Republic of Indonesia and International Partners Group 2022; Hartatik 2023a).

5.3.3. Unfinished processes that suffer from blind spots

But these processes also suffer from limitations. Some interviewees consider JETP and other bilateral agreements can function only if it helps tackle all issues pertaining to the energy sector (4-ind 2023b). This is however a difficult task to achieve. Some of the cooperation aims at tackling administrative issues, or to help build capacity in renewable energy manufacturing. But considering the administrative barriers against renewables and in favour of coal are very much related to entrenched coal interests, it seems very difficult for bilateral agreements to tackle these domestic issues.

A major limit is the fact JETPs are still work in progress, and many interrogation remain as on how it will unveil for Indonesia and other beneficiary countries (Jong 2022a). How exactly the funds will be obtained, by whom and for what remains unclear, and this is considered an issue within Indonesia, that still leads to major conflicts in the process (Aditya Hadi 2023; Hartatik 2023a). Luhut Panjaitan himself heavily criticised the lack of clarity over the projected low amount of grants in the package, and of the loans' high interests rates (Aditya Hadi 2023). In May 2023, he even made statements interpretated as a threat to leave the negotiations, showing the ongoing weakness of this cooperation process (D-insights 2023).

The fear has also been raised that the addition of new fossil fuel capacity will not be excluded by the deals, and several loopholes could affect their decarbonisation potential. One risk indeed would be to have gas electricity being rebranded as a transition energy to replace coal, an option that does not seem to be excluded (Andri Prasetiyo et al. 2023; Kramer 2022). For Ma and Ma, OECD countries are favouring gas in the transition away from coal, because of a powerful gas industry and vested interests in these countries (Ma and Ma 2023). In the case of Indonesia this would be a step back, especially in times of global gas market disruption, considering the country partly developed coal electricity to decrease its dependency on imported fossil fuels. Another risk is an inconsistency in future coal policy. Although the JETP's joint-statement specifies a moratorium on new CFPP will be set, Indonesia was at the same time still planning to build 13GW of coal power plants (Jong 2022b). The roadmap for CFPP shutdown is also criticised for being incompatible with a 1.5°C-aligned pathway, and to have a loophole on captive power plants, much like Indonesia's regulations (Achmed Shahram Edianto 2023).

This slow adoption comes from difficulties in the process, described by several interviewees (4-ind 2023a; 6-ind 2023). Difficulty to find agreement between all parties has been slowing down the negotiation. The conception of a 'just' energy transition, a concept hardly definable and being interpretable in many different ways, is said to have raised issues. Other difficulties mentioned have been administrative and power struggles within countries, in a process supposed to be horizontal and led by the receiving country, but where power inequalities arise (4-ind 2023a). There has specifically been disagreement between Japan and the USA on the issue of so called *clean coal* technologies, an issue won by the USA. As a result, *clean-coal* technologies have not been included. This non-inclusion has led to the parallel development of another project, which shows the possible negative effects bilateral processes can have. Japan, which has invested on many of these technologies, launched the Asian Zero Emission Community (AZEC) to promote them in South-East Asian countries, including Indonesia (4-ind 2023a). AZEC is seen as a danger for energy transition, because of its potential as a distraction of financial and technical resources away from renewables towards inefficient solutions and a possible expansion of fossil fuel industry lifespan (4-ind 2023b). It is even more an issue as in Indonesia, *clean coal* technologies are seriously taken into account by PLN.

5.4. Conclusion: Indonesian electrical system at a crucial moment?

Between the 1990s and the 2010s, a structure of power in favour of coal has arisen in Indonesia, as the coal extraction industry developed at a very fast pace. Throughout this process, the coal industry acquired political and economic power in the country, now occupying a key position in the state structure and the socio-technical regime. As of 2023, the socio-economic structure that gave rise to coal-based electrical development is still largely present. Yet, the international background is significantly less favourable to coal, while renewable energy development are starting to be a valuable alternatives on many aspects. A discourse of net-zero has been developed by the state, pushed by economic and political elite itself deeply related to the coal industry. This discourse has led some limited legal output and the start of significant changes in the energy development plans. But considering its high dependency of Indonesian coal and the amount of structural barriers, the Indonesian government is unlikely to give up on coal without significant help of foreign actors. The resource needed are financing, in the form of loan and grants, as well as technology transfer and capacity building, including in the domain of policy making, to help the country surpass its many barriers to decarbonisation. Because of an active role of the Indonesian government in finding international financing, and of a mobilisation of international organisations and united develop countries, bilateral and plurilateral agreements are underway. These agreements are not fully set yet and have certain limitations, but they have the potential to give provide these needed resources, and to be compatible with Indonesian developmental goals.

Because of a conjunction of internal and international factors, there seems to be a window of opportunity opening up for Indonesia to lower its reliance on coal electricity and for a certain decarbonisation of its electricity system. But this window of opportunity is fragile, and as of June 2023, does not seem Paris agreement-compatible yet. The amounts of financing needed for a thorough decarbonisation are enormous, and far from being fully met yet. To tackle the barriers, structural changes are needed, and will have to involve a deep cooperation between national and international actors, that go beyond renewable energy installation and financing. The fact that the economic and political structure that led to coal expansion is still present also puts the chances of success of that operation at risk. Its key actors being unlikely to support a transition that could present a risk for their own interests and contradict their goals.

6. China's decision and its effects in Indonesia

This chapter will attempt to answer the third study question: *How does China's decision enable actors to engage in electricity decarbonisation abroad ?*

Xi Jinping's declaration of September 21st 2021 has mostly received media attention for its statement on China not building any new coal power plants abroad. The full declaration also contained a first part though, on supporting renewable energy in developing countries. To fully understand the scope of this declaration, both have to be taken into account, especially in Indonesian context where foreign investment is considered as key.

This chapter will review the implications of Xi's declaration and its legal translations in the specific context of Indonesia. In its first part, the coal ban proper will be analysed. It will be discussed whether this type of unilateral ban has the potential to decrease financing and engineering procurement and construction (EPC) opportunities for future development of Indonesian coal power plants. Then, focus be put on the legal translation process and how this process specific to China's environmental governance led to loopholes that could limit the implications of the decision.

In the second part, the proposed support for low-carbon energy in developing countries will be analysed. A complement to the Energy Transition Mechanism (ETM) and the Just Energy Transition Partnership (JETP) is highly hoped for in Indonesia, to finance its ambitious plans on electricity development without any new coal-fired power plant (CFPP). In that aspect, China could play an important role, although this country's economic and political interests for fossil-based "low-carbon" electricity could mean more fossil fuel development in Indonesia. Even if support has been announced by Xi, many interviewees do not believe in an ambitious state-led support coming from China. Its main economic actors are judged unexperimented in that domain, and there seems to be little political will to implement such a project.

6.1. The coal ban: a limited pledge with no perceived impacts in Indonesia

6.1.1. A decision that limits financing and construction opportunities?

The Chinese coal ban is not the only one of its kind, and comes in a global movement that makes coal power plant financing and construction more and more difficult for actors wanting to develop these assets. Whether this type of unilateral ban can have an influence on CFPP financing and construction in Indonesia is uncertain. It could have a significant effect by closing one of the biggest loophole to that movement: Chinese money and construction. Some scholars and most interviewees do not agree with that vision though. Indeed, for them the ban does not fit in Indonesia's context. The electricity mix is already reliant on coal and believed not to have any new coal power plant extension in the future.

China's decision of September 2021 has been portrayed as a major policy on coal, but it can also been interpreted as a reflection of ongoing changes in coal policy and financing. On a global scale, the international coal pipeline is receding, and financing is starting to dwindle. Main financial actors and coal-financing states outside of China are phasing out their investments and assets in that domain, while keeping them in other fossil fuels. As of April 2022, 65 countries made a no new coal power plant pledge, although this category covers very different realities (Global Energy Monitor et al. 2022). China pledge is itself quite specific. On the one hand, Chinese decision is significant, because it applies to all Chinese financial actors and companies, whether public or private, when most countries' decision only apply to public institutions. On the other hand, it only applies to international power plants, not domestic ones, although China is home to almost half of worldwide CFPP capacity (Nedopil 2023).

One first major flaw of this decision is its inability to address existing carbon lock-in. The ban is directed at new coal power plants, but lets the ones already built and administered by Chinese companies running. While this can be a good way to avoid new countries from following carbon-intensive pathways, it is of little help for countries like Indonesia which are already locked in coal dependency.

This international situation can still be analysed as a good opportunity for China to deliver this kind of policy, as the country starts realising international CFPP financing and construction becomes a risky sector (Nedopil 2023). This decision helps increasing and solidifying a global trend on the long run, without being too painful for its mostly state-owned energy companies. Indeed, the amount of installed CFPP by Chinese companies or with Chinese funds have dwindled in the last years of the 2010s, after an accelerated uptake earlier in the decade. As new contracts are rare and existing projects have a strong tendency to be shelved or cancelled (Suarez 2021), Chinese actors would not have their direct interests strongly contradicted by this regulation. Yet it could still have effect recipient countries. In the context of Indonesia, Chinese investments have been considered as an opportunity to compensate the lack of western ones after COP21 (Tritto 2021). This type of decision could have the potential to make construction of coal power plants even more difficult in the recipient countries. For Indonesia specifically, gathering of sufficient financial and technical resources for the building of new CFPP is likely to become significantly more difficult and expensive, now that every country traditionally involved in CFPP financing and construction have pledged not to do so anymore. In this country, the electricity sector is very sensitive to price (see 4.1.2.). This global trend could have a great effect in pushing decisionmakers' out of new added coal, and seems to already show some result. For interviewee 4, the electricity unit of the MEMR is already becoming in favour of energy transition because international coal financing is now becoming too rare and expensive (4-ind 2023b).

Yet, this analysis is not unanimously accepted. For several observers, Chinese decision would not be affecting the construction trend much, it would largely be a symbolic change, a simple result of it (Nedopil 2023). The recent drop in international coal financing would be related to external elements, whether conjunctural or systemic, but in either way unrelated to it. There has been a decline in Chinese international investment since the COVID outbreak, with no signs of recovery as of 2023, meaning it is difficult to assess the efficiency of the ban based on the evolution of financial pattern (Ma and Ma 2023). For interviewee n°7a, Chinese coal oversees investment is decreasing, but the responsibility cannot be put on the translations of Xi's pledge. Instead, responsibility is more to put on an already shrinking demand side "it's hard to link it to any policy. I think it's more the industry which is fading, (…) the whole environment market is changing."(7-intA and 7-intB 2023). Many of the planned power plants at the time of the announcement were already unlikely to be open, and very little amount of new contracts were reported lately (Han Springer 2022). For the Global Energy Monitor, the analysis is similar: if 19% of the coal projected backed by China in 2021 got cancelled, the change is not due to China's ban but to recipients countries' change in policy (Global Energy Monitor et al. 2023).

In Indonesia specifically, this decision happened after a massive increase in coal production, not before it. As seen in 4.3., this increase itself led to a general over-capacity in the country, and a halt in capacity addition in the last years. For that reason, the potential amount of effected power plants is significantly lower, as well as the potentially avoided emissions. Indeed, every interviewee considers the ban to be without effects, or barely any (1-ind 2023; 2-ase 2023). Sign of a lack of interest, the country's decision is never mentioned by Indonesian interviewees, unless the question is specifically asked. Interviewees 1 and 2 even go further and consider the decision has no impact

because Indonesia was not planning on building any new coal power plants already before China's decision.

Yet, Indonesia was still planning on adding coal in September 2021, a significant amount of which with Chinese support. The PLN RUTPL 2021-2030 plan, published a few months before Xi's declaration envisioned an extra 13.5GW coal capacity increase, and a total 20GW fossil capacity increase in the decade (Tam et al. 2021). The fact that Indonesia was, or is, still planning to install more coal capacity is also confirmed by "Boom and Bust Coal 2022" report directed by the Global Energy Monitor, which estimated Indonesia to still have more than 10GW in the pre-construction pipeline (Global Energy Monitor et al. 2022). In June 2021, 7.1GW were still in pre-construction stage with planned Chinese funding or construction, even if no new project have been announced since 2017 (Suarez 2021). Furthermore, if Indonesia is facing oversupply issues, the halt in addition to the grid is only temporary. On the long term, the country is still planning to multiply by nine its installed capacity until 2060 (IEA and MEMR 2022), and if the country fails at securing sufficient amounts of low-carbon capacity, it might decide to resort to fossil fuels again to implement its plans.

6.1.2. A decision riddled with loopholes

The March 2022 *opinion* by the National Development and Reform Commission (NDRC), and the decisions on the ground that followed up on that have significantly diminished the scope of this ban's application, and shown an ambiguity in China's position on coal power plants.

Chinese environmental policy making follows a top-down structure, inspired from older economic governance of the country and described as 'command and control' by Li et al. (Li et al. 2019). Policy guidelines are issued at the top of the pyramid by the government, mainly by ministries, or in this case by the National Development and Reform Commission. Usually, environmental measures are applied at a more local level, specifically by provinces, their commitment being controlled by the Central Environmental Inspection (Li et al. 2019; Lo 2020). But in this case, the measure cannot be applied by the provinces, considering it is designed for foreign activities. The *opinion* does not explicitly solve that issue. This lack of designated enforcement authorities paradoxically does not seem to mean NDRC's *opinion* is void. For interviewee 7a, "no banks dare to give money to coal now, because they don't want to go against president Xi's pledge" (7-intA and 7-intB 2023). This can be seen in the fact pledges have been made by many of the major financial actors, these pledges being sometimes more ambitious even than the NDRC's *opinion* (Li et al. 2022). For example, Bank of China pledged not to finance any new coal mine or power plant starting on the fourth quarter of 2021, while coal mines are not affected by the NDRC's guidelines (Han Springer and Ma 2021).

This specific governance system has its flaws though, and several issues appear on the translation process, that can have more or less influence on the implementation of that ban on the ground. The boundaries of the ban are by nature unclear, leaving room for interpretations and for exceptions to happen, making it difficult to assess the impacts. Some experts expected this document to be followed by some national regulation bringing stricter and clearer measures (Suarez 2022), yet this does not seem to be the case, allowing for loophole to appear, that are unspecified in the law and difficult to be fully defined.

Some of the biggest loophole to Xi's decision do not appear in NDRC's document, but later in the application process. First, the definition of "new" power plants seems to have been interpreted as a power plant already under construction by the NDRC, as seen in the sentence "Completely stop building new power plants abroad; firmly and carefully carry forward coal power plants under

construction"[4](NDRC 2022). For Li, Li and Bo, the affected group of power plants is more limited, as there seems to be a consensus amongst actors that power plants that haven't reached financial closure before Xi's speech would be the ones most likely to be affected (Li et al. 2022). Yet, there are multiple cases of power plant undergoing construction, although they didn't yet break ground before Xi's declaration, or even before the NDRC's *opinion.* One of them, which will be situated in Pakistan and not Indonesia, is the Gwadar CFPP. Although many contracts such as power purchase contracts were signed before the declaration, it did not even reach financial closure as of April 2023, and was still believed to be built, with both Chinese financing and Engineering, Procurement and Construction (EPC) (Ebrahim 2023). The *de facto* definition of "new" power plants seems to not be uniformly defined, with potentially serious implications on the amount of avoided emissions.

Secondly, captive coal power plants do not seem to be included in the ban an new ones can still be built. For interviewee 7a, they cannot be stopped by current regulations because they have a different permitting system, do not need to be connected to the grid and because the companies have access to their 'own financing channels' (7-intA and 7-intB 2023). Indeed, the ban does not apply to any of the main interests of China: its internal market and the industrial parks of its companies. China's decision is only affecting other countries' ability to use new CFPP to develop their economy, not its own. Yet, half of the world's currently operating coal power plant capacity is located in China, and 85% of CFPP starting construction in 2023 where in that country (Global Energy Monitor et al. 2022, 2023). On a global scale, the biggest blind spot of that measure is certainly the scope of who it applies to.

Captive power plants are a specifically important issue in Indonesia. According to interviewees 7a and b, this Chinese captive CFPP pipeline is currently of 13GW in Indonesia alone (7-intA and 7-intB 2023). This capacity is significant, at it is equivalent to the whole amount of CFPP that can still be added on-grid according to the Indonesian regulations (see 4.2.2.). This is specifically an issue in Indonesia, where captive coal power plants are also uncovered by national no new coal policy introduced by presidential regulation, being a key part of Indonesian developments. Indeed, many Chinese industrial parks are present in Indonesia, extracting and transforming key resources of the globalised economy, such as nickel. Nickel is present in many EV batteries, and which exploitation skyrocketed with electrification of vehicles. Mining and smelting complexes such as in Kawasi and Morowali are expending their CFPP capacity by several gigawatts at the moment, with some plants having their contracts signed after Xi's declaration or even NDRC's decision (Global Energy Monitor 2022). In Morowali, these constructions occur after the owner pledged not to build any new CFPP (Tsingshan Group 2021).

6.2. An energy transition support yet to be materialised

Countries that are benefiting of Chinese capital and construction services are mostly developing countries that have been rapidly expanding their electric capacity in the last decades and plan on doing so in the future. Those countries are unlikely to give up on that expansion, meaning the emissions 'avoided' by the ban will only be so if the alternative energy source for extension is low-carbon. In that regard, the first half of Xi's pledge mentioned "'China will strongly support developing countries in the development of green, low-carbon energies". That would imply China's decision would not result in a limitation of Indonesian energy development possibilities, but also help meet its energy development goals with low-carbon energy. Since the declaration, very little amount of information

[4] Translated from Chinese: "全面停止新建境外煤电项目，稳慎推进在建境外煤电项目。"

has been provided to clarify the modalities of this support though, and some even doubt that any implementation of that declaration would happen.

6.2.1. An unclear pledge that seems to provide hope from the Indonesian state

The form of a potential support itself is unknown. If materialised, it could be a facilitation of domestic companies involvement in overseas low-carbon energy; or include a bilateral agreement with the recipient country. The type of resource brought by this support can also be very different: as seen in chapter 6, resources needed by Indonesia for decarbonisation range from financing to policy support and industrial capacity building support. NDRC's *opinion* of March 2022 does not clarify Xi's declaration much. In its point 14, it is mentioned to "encourage relevant industries" ("鼓励相关企业") in applying several technologies known as *clean coal*, and to "Research how to promote the green, low carbon development of industries such as steel in international cooperation." ("研究推动钢铁等行业国际合作绿色低碳发展。"). As seen in 6.1.2., this document is ambiguous by nature. It does not give any further information on how to "encourage" industries, nor which industry might be "relevant". It does not specify the nature of this "international cooperation" either: whether it is between industrial groups or states is unknown. One other important point is that the mentioned international cooperation does not concern on-grid electricity sector here, and is not specifically targeted at developing countries. It can then not be said that any proper legal translation to Xi's declaration on that topic has been provided by the NDRC. Similarly, no concrete development has been noticed by interviewees in Indonesia or on a global scale, except for limited dialogue between the ASEAN and China on renewable energy topics, that were already pre-dating the declaration (2-ase 2023).

Despite the lack of concrete output for support and the apparent lack of interest for the ban (at least in Indonesian environmental NGOs), it seems that the Indonesian state is still expecting a lot from a collaboration with China in the realm of electricity decarbonisation. Indeed, Indonesian electricity sector is in need of many resources to achieve decarbonisation, including much more funding than the $20B of JETP. For BloombergNEF, it would require $3.5 trillion for a whole energy sector with net zero GHG by 2050 (Henze 2022). PLN, which follows a goal of NZE for 2060, considers an investment of around $700B is needed. Either way, the Indonesian government still needs to secure dozens if not hundreds of times the amounts of investments provided by the JETP, and for that needs to pursue its policy aiming at establishing bilateral agreements (6-ind 2023). China can specifically be a good opportunity. Indeed for Han Springer, who deems support for renewables 'increasingly critical', China has the potential to support renewables in terms of financing and technology transfer (Han Springer 2022).

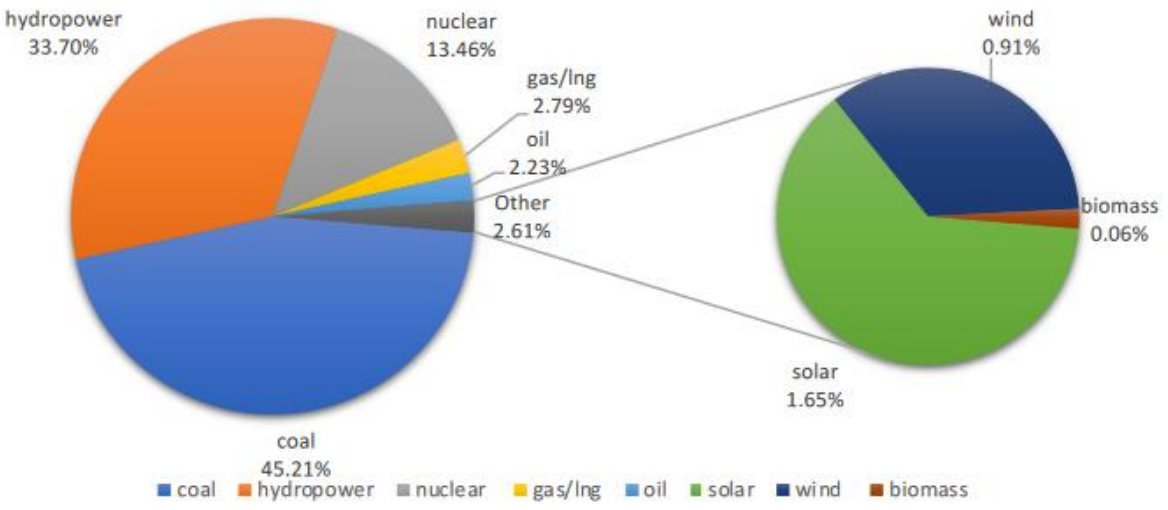
This willingness to find more investments can be seen in the increased amounts of interaction between key Indonesian and Chinese actors on the issue of "clean" energy. Luhut Pandjaitan, the Indonesian Coordinating Minister for Maritime Affairs and Investment, led a delegation to China on the 4th-5th of April 2023 and had meetings with some important figures of the Chinese state and of its economy. Luhut met with the head of Chinese diplomacy Wang Yi, the foreign affair minister Qin Gang, the head of the NDRC and the CEO of PowerChina. Aside from traditional topics of Indonesia-China economic cooperation, such as Jakarta-Bandung High-speed Railway, the communiqués of the last three meeting all advocate for an intensification of cooperation in the domain of energy. The wording is however different in each meeting: "renewables", "green energy", "hydropower and new energies" (Ministry of foreign affairs, People's Republic of China 2023b, 2023a; National Development and Reform Commission 2023; Rao 2023). Solar, which is believed to produce the bulk of Indonesian power in the future, according to the different state plans, is however not mentioned.

Aside from Luhut's visits, the month of May 2023 saw personnel from the Indonesian Ministry of Energy and Mineral Resources (MEMR) meeting with the NDRC, and PLN holding talks and signing contracts referring to renewable energies with some of the biggest electricity SOE from China. The company held talks with the direction of the State Grid Corporation of China on knowledge transfer pertaining to 'new energies', energy transfer and storage (Wang 2023). With China Huadian, "collaboration in the domain of clean energy" were discussed, more specifically in hydro, windpower, solar, hydrogen and biomass (eeo.com.cn 2023). PLN also signed a memorandum of understanding with China Communication Construction, to promote "energy transition" (China Communication Construction 2023). Finally, two memorandums of understanding have been signed between PLN and the China Energy Engineering Corporation (CEEC), one to install 5GW of hydro and solar in Morowali Industrial Park (Hartatik 2023b), another one concerning cooperation on renewables, grid update, storage, but also hydrogen, ammonia, gas-fired power stations and CFPP upgrade (Seetao 2023).

The focus on 'green' energy in the relationship between both states institutions is very new, considering it was virtually fully based on coal up to now. Most of it however is at the stage of discussions. Even if a new 5GW in renewables instead of coal is significant, it is nowhere the rate of installation envisioned by Indonesian plans yet. Another risk is the lack of precision in the vocabulary used. The words "green", "new" or "clean" energies, as well as "energy transition" are not defined clearly, and such unclear wording has already been used by the Chinese government to promote fossil fuel energy, as was done by the NDRC.

6.2.2. A support likely to be limited

Despite Indonesian interest on that matter, Chinese state and companies do not seem to be actively engaging in support for low-carbon energy in developing countries at the moment (5-intA and 5-intB 2023; 7-intA and 7-intB 2023). Yet, it seems that the country could have a strong economic interest in supporting installation of renewables, its industry being responsible for 72% of global solar panel construction, half of windmills (Ma and Ma 2023), and could gain access to new markets. But the economic and political structure does not seem favourable. Chinese financial actors and electricity SOEs are described as having little experience in renewables, while the state seems to lack political will.



Source: (Gallagher 2018)

Figure 4: Power projects financed by CDB and CHEXIM worldwide by sector (2000-2018)
Source: Kong and Gallagher 2020

Policy support seems even more unlikely, as the country lacks appropriate development agencies, akin to GIZ in Germany or AFD in France (7-intA and 7-intB 2023).

Chinese financial actors are described as lacking experience in financing renewable energy abroad. Specifically, CHEXIM and CDB, the two policy banks of China have virtually only financed fossils and hydroelectricity abroad, not new renewables (mainly solar and wind), despite having a "mandate to promote the globalization of the renewable energy industry" (Kong and Gallagher 2020, 2021). Considering renewable energy face technical barriers that fossil fuel projects do not know, this lack of experience in the sector jeopardises the chances of new renewables to become a cornerstone of Chinese involvement abroad. First, the scale of the investments are very different. State-owned companies are primarily involved in coal and bigger scale projects, when new renewables such as solar and wind tend to be more decentralised, at a lower scale (5-intA and 5-intB 2023; 7-intA and 7-intB 2023). These big institutions are hesitant in working at such low scales. Secondly, the criteria for considering an investment safe are different. The fuel being free but the infrastructure expensive, renewable energy projects require higher investments during the early stage than fossil fuels do. But at that stage, electricity tariffs are not signed, and the modalities for return on investment are not known yet (7-intA and 7-intB 2023). Without updated policy from banks and insurers, lenders are unlikely to bring funds to projects, considering the risks associated with the lack of knowledge on the return on investment, and the difficulty to find insurance. To address these issues, interviewee 7a calls for more support from policy banks and multilateral banks, suggesting cheaper financing options and a policy for risk reduction on the early stages of projects. But change is likely to happen slowly, as policy banks and Sinosure, the state export and credit insurer, have to build capacity in that sector, a lengthy process (7-intA and 7-intB 2023).

The lack of experience in renewable energy and energy decarbonization also applies to energy companies, especially SOEs, for which coal have played a very important role in both their inner and overseas developmental strategies. SOEs have built dominance in the coal market, but have let private actors take initiative in the sector of renewables (7-intA and 7-intB 2023). Private companies also suffer from a lack of influence in Chinese state, making it more difficult for them to secure financing for projects abroad, which largely comes from state-owned organisations in China (Kong and Gallagher 2021). Furthermore, such actors are not present in Indonesia, even the ones that have significant international projects, such as Jinko Solar, a major private PV construction company (Global Development Policy Center n.d.). As seen in 4.3., Chinese companies present in Indonesia are for a vast majority SOEs. These companies do have a presence in hydropower in Indonesia and other countries, but their experience in renewable energy beyond hydropower, such as wind and solar, is limited (Global Development Policy Center n.d.). While some SOEs have undertaken smaller-scale solar and wind projects overseas, their involvement is relatively minor compared to their hydro and coal assets (7-intA and 7-intB 2023). For Indonesia to over this issue, it should be able to create partnership with Chinese private companies such as Jinko, or for SOEs to build competence in the field of new renewables. Once again, both are lengthy processes that need governmental support.

Much like Indonesia, China has built its accelerated economic development on vastly available and secured energy sources such as coal, although hydropower also played a role. China's developmental state and its SOEs have structural interests in coal, which can explain its SOEs lack of experience in overseas renewable installation, but also a general environment in which the issue of electricity decarbonisation is not considered as central, far behind the developmental goals of energy

development and energy security. China as a whole is even described as “passive” by interviewee n°5b, being unable to take into account the risk surrounding coal early retirement for its companies. Chinese investors and companies are largely unaware of the risks associated with energy transition for their fossil fuel asset, which could become stranded assets (7-intA and 7-intB 2023). Questioning the use of gas as a pseudo-transitional energy is seemed as ‘risky’ for NGOs in China and this is not an openly discussed topic (7-intA and 7-intB 2023). All of these structural barriers make the perspective of a bilateral partnership unlikely for Interviewee 7a: “I heard this expectation from some Indonesian groups, but I didn't hear so many progress on this agenda yet”. For her, if something happens, it would be with way smaller figures than with JETP, using already existing development cooperation frameworks (7-intA and 7-intB 2023).

Yet, a few positive elements can be noticed. First, structures are not completely rigid and changes in SOEs are reported by the interviewees 7a and 7b. Interviewee 7a reports a new, strong willingness of the Chinese state to ‘promote renewable energy development’. This translates in new, “very strong KPI”(Key Performance Indicator) for SOEs to ‘explore the opportunity of RE investment overseas’, as well as some effort by Sinosure to help de-risk early stages of RE projects, and a general better covering of the commercial risk for renewables (7-intA and 7-intB 2023). These changes, although slow and limited, are facilitation for construction and financing by Chinese institutions. Other external changes might push for a larger involvement of Chinese companies in the installation of overseas renewables. Aside from a structural bias in favour of coal by Chinese institutions, Kong and Gallagher identify the lack of renewable demand by recipient countries as a major factor explaining the lack of new renewable financing by Chinese policy banks (Kong and Gallagher 2021). The new solar target in Indonesia calling for more PV installation, it is likely to change this situation, which could lead to China playing a role in financing and installing renewables in this country. But structures and narrative in both countries are favouring coal often at the expense of renewables, making it likely to limit the extent of collaboration between both countries. Lack of interest in China for CFPP early decommission and the influence of narratives around fossil-based transition technologies might even play a detrimental role in Indonesian decarbonisation efforts.

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6.2.3. A support that could be putting decarbonisation at risk

This possible cooperation could indeed lead to the development of so-called ‘transitional’ fossil-fuel, considering both states’ interests in these technologies. Embracing the energy transition rhetoric does not necessarily imply requestioning the position of coal and other fossil fuels.

China has interests in including fossil fuels in its energy transition support, and several signs show that it may very well happen. As already seen in 6.1.2. , far from clearing up the ambiguity of Xi’s declaration, NDRC’s *opinion* gave a very specific interpretation of “green, low-carbon energies” that would encompass fossil-fuel based technology. Renewable energies or nuclear are not mentioned. But point 14 of the *opinion* sets as a goal to “Promote the low-carbon and green development of completed overseas coal-powered electricity”[5], with specific examples put forth: “efficient and clean use of coal, adopt efficient desulfurisation, denitrification, dust collection, CO_2 capture, use and storage, etc.”[6] (NDRC 2022). This is also in line with China’s inner politics, where ambitious measures like coal early-retirement are not considered, but where domestic transition finance taxonomy includes so-called ‘clean coal’ technologies (7-intA and 7-intB 2023).

[5] Translated from Chinese “推动建成境外煤电项目绿色低碳发展”

[6] Translated from Chinese “采用高效脱硫、脱硝、除尘以及二氧化碳捕集利用与封存等先进技术”

This definition of “green energy” is dangerous, as it mixes up the issue of pollutants and of CO_2, while pretending that coal Carbon Capture, Utilisation and Storage (CCUS) is a technology that can make coal energy low-carbon. It completely disregards the current state of this technology, as only one CFPP CCUS has been successfully operating as of 2023. This experiment has been severely criticised for being expensive, energy-consuming but also extremely unreliable, as it suffered from many technical issues and only met around 40% of its capture rate target (Anchondo 2022; Rives 2022). NDRC’s decision goes even further than just including *green coal* technologies. By omitting other energies, this text considers it as *the main* green energy solution. While the communiqués from the meetings and contracts seen in 5.2.1. do not go as far, their use of ambiguous wording does not seem to close the door for that type of solution, and sometimes directly include coal technologies.

This inclusion can be even more dangerous because coal technologies can provide a narrative for a continued use of coal during energy transition. In Indonesia, coal serves the interests of PLN, of a significant part of the political and economic elite and of the developmental ideology, without challenging existing interests. Several proof of the potential damage of ‘clean-coal’ exist. One being Japan’s AZEC, which corresponds to the interest of Japan’s companies such as Mitsubishi, with which PLN is collaborating on development of coal-hydrogen co-firing (Tenggara Strategics 2023). Other example exist, such as the multiple Memorandum of Understanding signed between the Indonesian SOE and the American company Air Products on coal gasification, worth several billions of US dollars (Ghee Peh 2022). This type of collaboration also corresponds to the “compromise solutions” PLN wants to develop in its energy transition plans: “ammonia, coal gasification, biomass-coal firing, etc.” (6-ind 2023), as well as CCUS and coal-hydrogen co-firing (Tenggara Strategics 2023). These technologies do not help reduce carbon emissions, or only marginally, and can result in enhanced local environmental damages(Myllyvirta and Kelly 2023). But they help preserve coal-vested interests in exploiting loopholes present in the several coal-bans, and provide an output for the Indonesian coal-extraction industry.

Another risk would be to push for a transition towards gas, by promoting coal phaseout in isolation from other fossil fuels, and having Chinese companies simply installing gas instead of coal in its new additions. This can be a risk, considering there is no strong barrier against gas in any of the early retirement mechanisms or in the Chinese ban. The fact this energy is considered as safe and clean by many Chinese actors also increase the risk associated (7-intA and 7-intB 2023), even if China is not a strong contributor to international gas-powered electricity pipeline as of 2023, contrarily to OECD countries (Ma and Ma 2023). At the time the interviews were achieved, in April 2023, no replacement of CFPP by gas had been noticed by experts after the ban in Indonesia, when Li, Li and Bo make mention of this scenario in Viet Nam (7-intA and 7-intB 2023; Li et al. 2022). But in May 2023, the CEEC signed a deal with an Indonesian IPP to build a new LNG terminal and the first third of its associated 2,4GW gas power plant (CPEIC 2023). This future installed capacity is significant, showing the potential of Chinese-backed gas power plants to contradict decarbonisation plans. This addition would represent 44% of new installed gas power plant capacity for 2021-2030, according to PLN’s plan (Tam et al. 2021). It would also increase LNG capacity, although the IEA considered that global existing LNG capacity is already not compatible with its Net Zero Scenario (Merleaux et al. 2023). Furthermore, this new power plant will be installed 200 meters away from Pelabuhan Ratu coal power plant, bound to early retirement in 2035 thanks to ADB’s ETM (PTBA Team Jakarta 2022). Whether both events are related or not, it seems that the loopholes on gas at the same time in the early retirement mechanisms and the Chinese ban are together allowing to a certain extent of coal-to-gas transition in the country.

It could even be followed by more of its kind, referring to the terms of a memorandum of understanding signed between PLN and the CEEC in the same month, that included cooperation on gas

turbines (Seetao 2023). This new discussion on gas electricity between both SOE does not seem as developed as the ones on renewables at the moment. But this is a sign that the door is not closed for fossil fuels in the new electrical cooperation between both countries. This fossil-to-fossil transition could be seriously putting at risk Indonesia's decarbonisation prospects and the lack of ban on fossil gas from any foreign actor is a loophole that can have a very detrimental potential, even in Indonesia.

6.3. Conclusion: A decision that gives little resource for decarbonisation

China's ban perceived lack of effect on CFPP construction in Indonesia can be explained by its unilateral nature, which does not give much resources for actors, from China and recipient countries alike, to act for decarbonisation. It also makes it unable to adapt and take into account the situation in the country or to propose alternatives. This is in contrast with the hopes raised by JETP or the ETM. These initiatives indeed bring strong negative incentives against future coal development in the recipient country, by planning a coal peak and pushing for more intensive policies against coal. But they are given in return for a positive incentives for coal early-retirement and for renewable, providing with resource such as financing and policy support meant to be adapted to the recipient country's needs.

China's decision for the moment fails at bringing any of these positive incentives, as no concrete actions following up to the proposed low-carbon energy support have been disclosed. China has potential to help on low-carbon energy installation and grid update, two sectors it has experience in and resources it could provide, if there is significant political support to channel this support properly. But this is hindered by China's own developmental history, where coal has played a crucial role, and where much of the state and its company has interests highly vested in coal, leading in several structural barriers against a full-fledged support for decarbonisation abroad. In policy support and industrial capacity building specifically, China has little interests and knowledge, making it unlikely to play a role in tackling these barriers in Indonesia.

It also has negative incentives against coal that are unlikely to have significant effects in short and medium term in the Indonesian context. These negative incentives are also not retroactive, which means the ban cannot be helping in breaking Indonesia's carbon lock-in. Finally, it does not include CFPP that are at the core of China's interest: permitted plants, captive plants and the ones located on its own territory. For all those reasons, it fully puts the responsibility for decarbonisation on the countries China has until now facilitated carbon-intensive development in. Yet, as seen in chapters 5 and 6, Indonesia is deeply locked in a carbon-intensive electricity system, lacking key resources needed for breaking out of it, putting that decarbonisation at risk.

7. Discussion

This thesis is a case study, as an attempt to understand China's decision by putting it in the context of one of the potentially affected countries. This case study also gave the opportunity to take into account several modalities of climate actions against coal, their perception by stakeholders as well as their possible outcomes. In this sections, the findings, the theoretical framework and the methodology will be discussed. First, Chinese decision will be put in a larger picture, by discussing the potential impact on some other developmental states that have received support in coal uptake by China, specifically Pakistan. Secondly, the use of the developmental state literature and its implication for this thesis will be discussed, as well how this thesis positions itself with that literature. Finally, it will be discussed how the methodology has influenced the findings.

7.1. Reflections on findings: Implication of China's decision for its main electricity partners

Indonesia is one of the countries where China's decision can be considered as having the most significance, considering the long and important relationship between both countries in coal-fired power plants construction. It is however not the only one the decision applies to. Other countries have received significant support from China to develop their coal power plant assets, with many similarities but also differences in how this decision affects them.

One of these countries is Pakistan. Both in the case of Indonesia and of Pakistan, financing for coal was easy to gather until the late 2010s. China has played an important role in both country, facilitating a significant increase of local GHG emissions and a carbon lock-in (Malz et al. 2023). This is especially the case for Pakistan, which has a special relationship with China (Bhandary and Gallagher 2022). To counter Indian influence, China has supported development in Pakistan through the China Pakistan Economic Corridor, vastly easing Pakistan's access to cheap financing, despite the dire economic conditions of the recipient country.

Pakistan has decided to ramp up its coal electricity since the 2010s via national plans, to comply with its developmental goals with a rationale very similar to Indonesia. There too, Chinese coal-fired power plants (CFPP) have been chosen as a way to promote energy sovereignty and security, to replace expensive oil generators which used imported fuel, Pakistan having important resources of lignite (Bhandary and Gallagher 2022; Goodman 2023). Coal is a resource which exploitation, transport and use is rather reliable and predictable. This security is important to solve its recurrent and crippling blackouts and ensure universal access to electricity (Bhandary and Gallagher 2022). It also allows cheap electricity production and Independent Power Producers (IPPs) charge the government way less than with renewables, an important criteria for development in a cash-strapped country (Goodman 2023). As a result, coal installed capacity has known a significant surge in this country too, although Pakistan made the choice to promote a wider array of electricity sources, contrary to Indonesia. Coal electricity was there almost non-existent before the 2010s, but since 2012 8,3GW of coal have been installed with Chinese funds, several times as much as nuclear, hydropower or gas (Global Development Policy Center n.d.; Goodman 2023).

One big difference between Indonesia and Pakistan however is the political willingness to decarbonise. Pakistan has stated in its NDCs to reach 30% of renewables in its electricity mix of 2030, but this is inconsistent with its current policy, which now estimates a 12% share (Government of Pakistan 2021; Nicholas 2021). Net-zero is also not in sight of this country's policy. The country pledged

not to build any new coal power plants in 2020, before Chinese pledge, but since reverted its stance (utilities-me.com 2020). Since February 2023, Pakistan is even planning to quadruple its CFPP capacity, which would most likely make it the biggest source of electricity in the country (Peshimam 2023). In Pakistan too, coal is planned to be used as a replacement to imported gas, after war in Ukraine revealed the weakness of the international supply chain of this resource.

China's ban might affect Pakistan and Indonesia differently, then. Indonesia has been going through a process of marginalising coal in its policy, and solidifying net-zero pledges. The loss of China as a possible CFPP enabler is then unlikely to have much effect, aside from further deterring the country from opting for this resource again in the future. In the case of Pakistan however, it is likely to have a big impact for the country's coal development plans, and development plans as a whole. Without available Chinese fundings and construction, it is likely that the country will have more difficulty to secure cheap and reliable alternative and implement its project. This is even more true that China's decision has been considered as potentially having significant influence on Pakistan energy policy because of this country's historical heavy reliance on China (Bhandary and Gallagher 2022). A first criteria to determine the extent to which the Chinese decision affects a country is then its inner policy. If Indonesia seems to fall into the categories of countries where this decision has little effect as of June 2023, this does not seem to be the case of Pakistan.

This analysis on inner policy can also be applied to other big recipients of Chinese CFPP such as South Africa and Vietnam. Vietnam planned on furthering its accelerated generation uptake, but instead of basing it on coal, using solar as a basis for development. This is comparable to Indonesia's MEMR plan with the IEA. It stated in its very ambitious Power Development Plan of 2023 to peak coal in 2030 and fully replace it by 2050 with solar, gas, biomass and ammonia as alternatives (Barnes 2023). Considering the similarities between Indonesia and Vietnam, it seems unlikely that China's ban would have much impact on the country's electricity sector decarbonisation, even if loopholes in favour of coal exists, such as ammonia co-firing. South Africa has a specific profile in that list, considering it is the

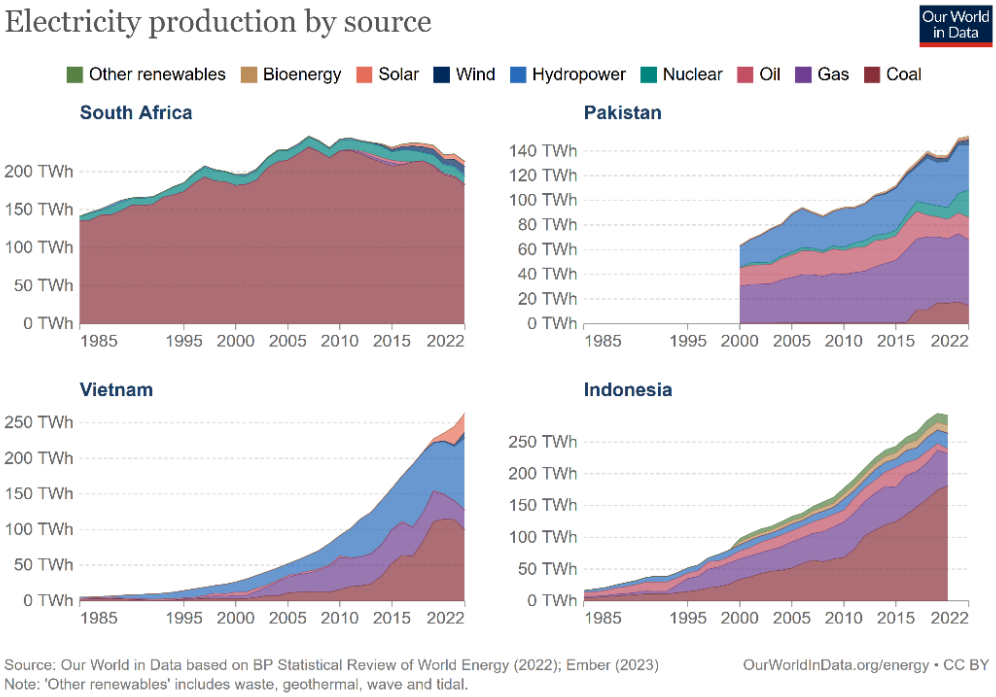

Figure 5: Electricity production by source for South Africa, Vietnam, Pakistan and Indonesia
Source: Our World in Data, 2023

only country which power generation has known no increase in the 2010s, and instead even receded in that period (Our World in Data 2023).

It is still possible however that Pakistan could bypass the ban to a certain extent. The country has been able to use some of the many loopholes of the measure and could be able to still do so in the future by using captive power plants and a very narrow definition of "new" power plants. Gwadar CFPP is an example of such limits. This on-grid plant is planned to start construction by a Chinese company in 2024, and has been able to secure Chinese funds with the benediction of the Chinese ambassador in January 2023, well after the ban. This construction is happening on the basis of a power purchase agreement and several other contracts being signed before 2021, even if financing was not secured yet and financial closure is still to be reached (Ebrahim 2023). This very narrow interpretation of a "new" power plant could be an isolated case due to the importance of Gwadar for Chinese interests, but it could also be a precedent for other power plants where financial closure has not been set yet.

Pakistan case also allows to understand environmental pledges and policies can be turned against, if there is strong interest against, in the light of its own coal ban. In the case of countries where many interests are vested in coal, such as China or Indonesia, these policies can be diminished or even completely discarded. On a larger topic on the future of coal in developmental states and the efficiency of developed countries coal policy, a case study could be conducted in Pakistan or in other developmental states planning on adding further capacity. The evolution of its new coal development plans could help understand how development states try to secure investments and construction for their energy development plans when countries and organisations with access to these resources multiply pledges against coal.

Pakistan's new coal expansion project can be insightful on the effects of the Chinese decision, both on the ability of the ban to deter future coal extension project, and on the ability of China to provide with effective renewable energy financing. It is too early to tell if this announcement is going to be followed by action, and the evolution this plan could be a good assessment of China's decision ability to lower future coal pipeline and curb its partner countries increase in greenhouse gases emissions. Pakistan is a specifically interesting country to study, considering it is the only one mentioned in this discussion that has not signed a Just Energy Transition Partnership with western country, and its trajectory can probably help understand the implication of both OECD countries and China on international electricity sector decarbonisation. The fact that Pakistan is planning on relying on coal to pursue its developmental goals is however already a sign that the country lacks good alternatives. It is the result of a failure of developed country, including China but also western countries, to make low-carbon energies an acknowledged and viable power source for developing countries.

7.2. Reflection on the theoretical framework

Explaining the ability of developing country to break out of carbon lock-in requires understanding the structures, discourses and dynamics that led to these lock ins. Developmental state literature was in that regard very helpful to understand electricity development in Indonesia, a case that perfectly fits in the developmentalism framework.

The case of Indonesian electricity sector perfectly fits the developmental state framework, as it has developmental structures, with a state administration dedicated to development, working around plans which set its developmental goals, and through interest collaborations with capitalist structures.

The mainstream developmentalism literature not taking into account environmental issues, this work diverged from it in many points. For that reason, this thesis has built on different fields of study, relating to Political Ecology or to Energy Transition. This has been do in a certain amount of works from the developmental state literature, such as the work of Swilling, Musango and Wakeford on the case of South Africa. Even if there are differences between countries, this work has been very useful, combining concepts of developmental state and sustainability transition, critically engaging with them. This literature was helpful in analysing processes at play in the Indonesian electricity sector.

This thesis diverges from most of the developmental state, political economy and political ecology literature used in the focus of the research. One of these divergences comes from the level of focus, as multi-level approaches are used by many studies in these fields. These approaches can also include local level, or distinguish between niche, regime and landscape. For instance, Fünfgeld's work of 2019 largely takes into account local-level mobilisations against coal, considering the many externalities of this resource at this level (Fünfgeld 2019). Ordonez et al. also describes the interactions between local, regional and national economy and politics to explain the success of that resource and the interests vested in its exploitation (Ordonez et al. 2021). Those factors are only marginally taken into account in this thesis, as the choice has been made to focus on the national and supra-national levels. This has implications on the results for the type of transformations that can lead to energy system decarbonisation. Significant parts of the political ecology and developmental state literatures consider solutions as structural reforms at a regional and national level. For example, Ordonez et al. conclude that "climate mitigation policies in the energy sector depend on two factors: (…) restricting the political influence of the coal industry by reforming the governance structure of PLN (…)" and managing stakeholders' interests through compensation system to avoid resistance (Ordonez et al. 2021). Swilling et al.'s conclusion discusses the ability of South Africa to make renewables transform from niche technologies to cornerstones of the socio-technical regime. This analysis also mainly takes into account national and local structures. It considering how South Africa has to a certain extent been capable of fusing developmental and environmental objective, making it a niche technology. At the same time, it studies how coal provides rents to a political and economic elite (Swilling et al. 2016).

The results of this study are quite dissimilar with these findings. It seems like a window of opportunity for decarbonisation is opening, although the conditions of structural changes and separation of the state and coal interests mentioned by much of the literature are not met. A focus on national and supranational levels, based on the focus of several NGO reports, allows to take into account inner structures but also foreign actors: nation-states, international organisations and international companies. The role of these foreign actors seems to be key, as long as they engage in bilateral or multilateral processes that provide significant resources such as financing, capacity building and policy support, and avoid the use of any type of fossil fuels. These results are not necessarily opposed to the ones mentioned earlier though, as internal policy reforms are a major challenge to the accomplishment of climate mitigation policy. The continued influence of the coal industry over the state can put at risk the willingness of the economic and political elite to diverge from coal on the long term, building interests in the solar industry instead. The key importance of these factors is not denied, but they are completed by other, external factors that tend to be overlooked in the quoted literature.

7.3. Reflection on the methodology

The topic of this thesis being recent, little data has been available from peer-reviewed work and databases on Chinese involvement in overseas power sector have not been updated yet. Even the ones that are updated, do not provide reliable information on the effects of the pledge through

quantitative data, as many other factors play a role in the evolution of these involvements, such as the effects of COVID-19. It was then necessary to get data from other sources.

Reports from NGOs or international organisations have been an extremely valuable source for data and analysis, as the time lapse for publication is significantly shorter for them, while most often having very serious methodology and providing with solid data. Similarly, many scholars published working papers or articles in specialised or general news outlets. Another valuable source for getting information on that rapidly evolving topic was newspaper articles and communiqués from companies and governmental organisations. That type of source has also been widely used in this thesis to get information on projects and compare the situation on the ground to plans and regulations, giving an understanding of the application of policies. This very flexible source also allowed for verifying claims from interviewees or get information on further evolutions, even once the interviewee phase was over.

Finally, experts and stakeholders interviews have been a key source for this research. Once again, interviews can give access to information that has not been published yet, or was not aimed at been published. It also helps get insights from people working in this sector, on the processes, narratives and personal opinions, as well as getting a better understanding of the relevant structures, actors, and legislations. Some data also had some level of confidentiality and could not be published in this thesis for that reason. The inability to include these findings in the thesis somewhat affect the result of the thesis and its conclusion, although as much as possible has been done to avoid this. Another advantage of interview was to have access to different point of views on the topic. This has partly been a success, as it has been possible to get interviews with people from different organisations, all of them being in direct contact with actors from governmental, financial and energy sectors from either China or Indonesia. Gathering these different testimonies have allowed to get an indirect overview of different important stakeholders' understanding of the situation between China and Indonesia.

Several factors have influenced the interview sample, and ultimately data gathered, the scope of analysis and the findings. Not speaking Indonesian and not being located in the country, few data from local and regional levels have been gathered. This played a role in the choice to focus on national and more importantly international levels in this thesis, as seen in part 7.1.. For example, the vast majority of the barriers for decarbonisation of Indonesian electricity mentioned by interviewees were internal. Yet the interrogated sample overwhelmingly placed their hope in international cooperation and fundings. Similarly, the sample of Indonesian interviewees has most likely been biased towards international, western-leaning organisations (through fundings or work cooperation), a bias mentioned by interviewee n°6. This relatively small diversity in interviewees most likely influenced findings. A different sampling, with interviewees directly working on projects with Chinese entities might have biased the data on the other direction, overestimating the effects of the Chinese decision. Furthermore, the sample has been affected by the fact no companies or state organs have replied to invitations for interviews despite numerous tries in that direction, through different channels. The only favourable answers came from people from NGOs or international organisation, these people often having themselves a position or researchers or previously having had this position in their organisation. This has led to a somewhat uneasy position where much of the analysis done here is itself an analysis of analyses.

8. Conclusion

This thesis aimed at getting an understanding of China's 2021 declaration on banning new coal power plant construction abroad and supporting low-carbon energy development, as coal gets targeted by climate mitigation policies in many countries throughout the world. China's decision has a potential to be significant, this country having played an important role to help developing countries installing coal power plants in the last two decades, but it also suffers from a limited focus and several loopholes. Focus has been put on Indonesia for the case study, considering this is the country with the highest coal power plant capacity installed with Chinese funds and/or construction services, and is still believed to know accelerated electrical development in the next decades (Global Development Policy Center n.d.).

For the study, a literature review as well as stakeholders interviews from environmental NGOs and an international organisation have been conducted. The literature review has been done on the fields of development state, political economy, as well as much literature on Indonesian energy governance, environmental governance, Chinese overseas electricity installation and on the Chinese coal ban. On addition to peer reviewed articles, reports from NGOs or international organisations have been extensively used.

These helped in answering the main study question of the thesis: "*To what extent is China's pledge affecting Indonesia's electrical development and carbon emissions?*"

The key finding of this thesis is that the Chinese declaration and its current legal translations are unlikely to affect Indonesian electrical development and carbon emissions. Indeed, the only part of the declaration that has known concrete translation, is the coal ban, and the support for low-carbon energy seems still very unclear as of June 2023.

The coal ban is by itself very limited. Being an unilateral ban, it cannot adapt to the specificities of the countries it applies to and does not give much means for different actors to tackle existing lock-ins and develop low-carbon alternatives to coal.

Indonesia is a country where electricity development is a key political goal to sustain global economic development, and where coal is a cornerstone of this strategy. Recently, technological advances in renewable energies has allowed for Indonesia to reframe its future energy development plans on a different basis, where renewables can both sustain ambitious developmental goals and decarbonisation. The country however faces several barriers to achieve these plans: most of its political and economic actors interests are vested in coal, which has led to a structure that inherently favours coal over other sources of electricity. Pricing mechanisms, grid architecture and administrative processes for capacity installation are some of the main barriers against the development of renewables. Another major barrier cited by experts and stakeholders is the amount of young coal power plants, whose emissions are incompatible with ambitious climate mitigation efforts if operated throughout their expected lifespan. Many resources are needed to overcome the structural barriers against decarbonisation and sought on an international level, which can be divided in three types: policy support, capacity building, fundings.

China's ban is solely a negative incentive against coal, and at the current stage does not provide its actors with tools to share with Indonesia any of these resources, or only in limited amount. For that reason it does not help solving the compatibility issues between Indonesia's developmental goals and sustainability, and fully puts the responsibility to bridge that gap on the recipient country. The ban's main strength is to make recipient countries' future coal development more difficult to happen, by closing Chinese sources of financing and construction, as well as associated insurance. But for Indonesia,

it appears after an important coal increase, at a moment where construction of future coal power plants was already planned to be reduced. Furthermore, loopholes affect the extent of this ban, by potentially allowing significant amounts of off-grid coal power plants to be constructed or having a lax definition of “new” coal power plants that cannot be built.

A support for renewable energy development in developing country has also been declared in Xi’s intervention, but as of June 2023 has not been implemented. Yet, the potential of bilateral or plurilateral decarbonisation support is unanimously recognised by Indonesian state actors, NGOs and scholars. This type of initiative have way more means to provide than unilateral decisions, as they can adapt to the situation of the country, and provide with locally needed resources to avoid or tackle carbon lock-in. Several example of this type of cooperation exist, such as the Just Energy Transition Partnership, led by OECD countries, or the Energy Transition Mechanism by the world bank. Even if these initiatives are not sufficient in themselves and suffer from several drawbacks, they to a certain extent allow the Indonesian state to engage with its own structural problems. The signs of the Chinese state engaging in an ambitious support of decarbonisation efforts seem very limited though, and it seems more likely that the country engages in limited reforms easing renewable energy support. Even if China was to engage in bilateral cooperation, the country itself has structural interests in coal, and it is extremely unlikely that China engages in key support areas: policy reform, capacity building and coal early retirement. China’s position and policy is then not helping Indonesia achieve its decarbonisation goals or surpass them, a situation which is putting at risk the ability of this country to fall in line with Paris agreement-compatible pathways.

8.1. Recommendations for stakeholders

To unlock energy transition, Indonesia needs to tackle administrative barriers to renewable energy development, while securing inner and foreign finance in renewable energy, grid update and coal early retirement. China is at the moment helping in none of these issues. The proposed low-carbon energy support, only part of the pledge that would have the potential of having an impact on these processes, is at the moment unspecified and not concluded. Although China has many interests in both coal and renewable, and a sizeable influence in the region, both directly in the energy sector and in other sectors, it does not seem to be taking a leadership position in the energy transition nor in defending its existing coal assets. In both directions, China seems in this specific case to be passive, far from its climate leadership ambitions and new powerful global player it might be described as.

Both China and Indonesia should follow the recommendations of Antonio Guterres for the publication of the IPCC AR6 WG3 report. For domestic policy, of a 2040 coal-free and net-zero electricity system for all non-OECD countries, and on the international level, of “ending all international public and private funding of coal” (Guterres 2023). For China, that would mean fixing the loopholes to its coal ban, specifically on captive power plants and so-called clean coal technologies. It would also extend this ban to all sectors of coal activity, starting with the upstream activities such as coal mining.

For Indonesia, it would mean revising its energy-related development plans, to completely avoid the use of expensive transition fossil fuels, and avoid relying on uncertain CCS/CCUS technologies to attain net-zero in the electricity sector in 2050. Indonesian actors such as PLN should integrate other factors alongside carbon to assess sustainability of new power plants, and should avoid a widespread usage of technologies and project detrimental to biodiversity such as biofuels in their plans.

China should implement its proposed support for low-carbon energy in developing countries, to complement its ban and allow recipient countries to take advantage of low-carbon energy to fight

poverty, even without the use of abundant fossil fuels. This support should exclude all forms of fossil-fuel or fossil-fuel installation upgrades. It should also focus on knowledge transfer, as exploitation of renewables requires much knowledge countries with fossil-based electricity often lack.

To ensure efficient support to low-carbon energies in developing countries, China should develop strong incentives in its SOE to build capacity in this domain, to exploit and share existing knowledge in intermittent renewables specifically, which have a high potential in many developing countries.

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