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**HISTORICAL INSTITUTIONALIST ANALYSIS OF LOW-CARBON ENERGY TRANSITION  
IN THE PHILIPPINES AND INDONESIA**

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S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES**

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## Supervisor Declaration Statement

I have reviewed the content and presentation style of this thesis and declare it is free of plagiarism and of sufficient grammatical clarity to be examined. To the best of my knowledge, the research and writing are those of the candidate except as acknowledged in the Author Attribution Statement. I confirm that the investigations were conducted in accord with the ethics policies and integrity standards of Nanyang Technological University and that the research data are presented honestly and without prejudice.

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30 August 2024

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## Table of Contents

Abstract.....	9
Figures.....	11
Tables .....	11
Chapter 1 Transitioning from Fossil Fuels to Renewable Energy Sources .....	12
1.1. Introduction .....	12
1.2. Research Questions.....	18
1.3. Hypotheses.....	18
1.4. Variables.....	18
1.5. Research Design and Methodology.....	25
1.5.1. Case Study .....	25
1.5.2. Conceptual Framework .....	34
1.5.3. Data Collection Methods.....	35
1.6. Relevance and Contribution.....	38
1.7. Study Limitation.....	40
1.8. Structure and Organisation of Dissertation.....	41
Chapter 2 Literature Review of Energy Transition.....	42
2.1. Introduction .....	42
2.2. Setting the Context.....	43
2.3. Sociotechnical Transition.....	50
2.4. Gap in Sociotechnical Transition Literature .....	53
2.5. Historical Institutionalism.....	60
2.6. The MLP and Historical Institutionalism in Energy Transition Studies .....	70
2.7. Existing Studies on the Philippines and Indonesia .....	76
2.8. Summary .....	80
Chapter 3 Tracing the Philippine Pathway to Low-Carbon Energy Transition .....	84
3.1. Introduction .....	84
3.2. The Founding of the Philippines Energy Sector (late 19 <sup>th</sup> century to mid-1940s).....	84
3.3. Energy Sector in Post-1946 Independence Era (1946 to 1972).....	89
3.4. Nationalisation of the Energy Sector in Marcos' Martial Law Era (1972 to 1986) .....	98
3.5. Re-Privatisation Initiatives Post-Marcos Era (1986 to 2001).....	107
3.6. Renewable Energy Development Era (2001 to 2024) .....	116
3.7. Low-Carbon Energy Transition Development Progress .....	133
3.8. Summary .....	145

Chapter 4 Tracing Indonesia’s Pathway to Low-Carbon Energy Transition .....	149
4.1. Introduction .....	149
4.2. The Founding of Indonesia’s Energy Sector (late 19 <sup>th</sup> century to mid-1940s) .....	150
4.3. Nationalisation of Energy Sector in Post-Independence Era (1945 to 1968) .....	155
4.4. Energy Diversification during Soeharto’s Authoritarian Era (1968 to 1998) .....	161
4.5. Energy Sector in the Early Reform Era (1998 to 2014) .....	169
4.6. Renewable Energy Development Era (2014 to 2024) .....	185
4.7. Elusive Low-Carbon Energy Transition Progress .....	204
4.8. Summary .....	209
Chapter 5 Pathways of Energy Sector Developments: A Comparative Assessment.....	213
5.1. Introduction .....	213
5.2. Energy Sector Formative Years.....	213
5.3. Post-Independence Energy Sector.....	214
5.4. Energy Sector during Authoritarian Regime .....	216
5.5. Energy Sector in the Post-Authoritarian Period .....	218
5.6. Renewable Energy Development Era.....	220
5.7. Low-Carbon Energy Transition Outlook.....	222
5.8. Summary .....	225
Chapter 6 Summary and Conclusion.....	228
Appendix A Research Participants .....	248
Appendix B Renewable Energy Development Statistics in the Philippines and Indonesia.....	253
Bibliography.....	260

## Abstract

This dissertation seeks to examine why developing countries still take up low-carbon energy transition agenda despite financial and technological hurdles, and why some of them implement the agenda faster than others. This study argues that despite financial and technological hurdles, a developing country still decides to implement low-carbon energy transition agenda because the State positively evaluates the benefits of renewable energy development for the country's economic and energy security interests. The pace of progress is subsequently influenced by State involvement in the energy sector, its interests and priorities, and its relation with the private sector, which are formed through historical sequences and processes over time.

This study employs mixed research methods comprising longitudinal and cross-sectional approaches; and data collection methods comprising archival, secondary data and interviews. To enable an in-depth investigation of the different contexts and interactions that have yielded to different policy outcomes at different points of time in developing countries, this thesis employs a qualitative comparative approach using the Philippines and Indonesia as case studies.

Applying historical institutionalism within the sociotechnical transition's Multi-Level Perspective (MLP) framework, this study identifies four periods of analysis and examines how the interactions between two variables (State involvement in the energy sector and State relation with the private sector in the specific industry in the energy sector) have influenced the transformation of energy policies leading to renewable energy development within the four periods in both countries. It applies historical institutionalism's critical juncture, path dependency, and incremental change concepts to examine the evolution of the study variables through time, which then gives a comprehensive understanding of the reasons for developing countries to take up low-carbon energy transition agenda and explains why some of them show better progress than others.

The study finds that while both the Philippines and Indonesia have assessed renewable development as a viable solution to their domestic needs, the Philippines regarded renewable energy expansion more favourably given its longstanding energy security interest in developing indigenous renewable energy sources. The comparative analysis also shows that the Philippines was more determined to pursue the agenda and was more willing to create a conducive environment by supporting the private sector to achieve its renewable energy objectives compared to Indonesia.

These observations also help to formulate a more realistic assessment of the prospects of low-carbon energy transition processes in both countries. There is more promise in the Philippines, while one could anticipate a more difficult trajectory for low-carbon energy transition in Indonesia moving forward.

## Figures

Figure 1.1: Historical Greenhouse Gas Emissions based on Sector (1990 to 2021) .....	13
Figure 1.2: Solar and Wind Energy Productions in the Philippines and Indonesia (2009 to 2017) .....	17
Figure 1.3: Independent-Dependent Variable Relation .....	23
Figure 1.4: Power Generation Mix in the Philippines (2005 to 2022) .....	32
Figure 1.5: Indonesia’s Primary Energy Supply by Sources (2005 to 2022).....	33
Figure 1.6: Triangulation Research Methodology Model .....	36
Figure 2.1: The Changing Uses of Various Energy Sources (1800 to 2000) .....	46
Figure 2.2: The Application of Historical Institutionalism in the MLP’s Sociotechnical Regime	82
Figure 3. 1: The Philippine Primary Energy Supply Mix, 1973 to 1989 (in %) .....	105
Figure 3. 2: The Philippine Primary Energy Supply Mix, 1990 to 2008 (in %) .....	116
Figure 3. 3: Gross Power Generation Share by Ownership in the Philippines (2003 to 2019)...	119
Figure 3. 4: Competitive Renewable Energy Zones (CREZ) in the Philippines .....	129
Figure 3. 5: Dependable Capacity per Grid, by Plant Type in MW (2007 to 2023) .....	133
Figure 4. 1: Total Installed Capacities in Years 1923 and 1928 (in MW).....	154
Figure 4. 2: Indonesia’s Primary Energy Supply by Sources (%), 1980 to 1999 .....	169
Figure 4. 3: Indonesia’s Primary Energy Supply by Sources (%), 2000 to 2012.....	185
Figure 4. 4: Indonesia’s Primary Energy Supply by Sources (%), 2013 to 2023 .....	203
Figure 6. 1: The Four Periods of Comparative Historical Analysis.....	230
Figure B.1: Solar and Wind Generated Capacities in the Philippines (2008 to 2020) .....	255
Figure B.2: Solar and Wind Generated Capacities in Indonesia (2008 to 2020) .....	255

## Tables

Table 4. 1: Petroleum Trade in 1921.....	152
Table 4. 2: Timeline of Indonesia’s Climate Change Policy (2004 to 2014).....	175
Table 6. 1: Summary of the Historical Evolution of the Philippines’ Energy Sector .....	238
Table 6. 2: Summary of the Historical Evolution of Indonesia’s Energy Sector .....	239
Table A.1: Research Participant List.....	248
Table B.1: Renewable Energy Potentials and Their Utilisation in the Philippines .....	253
Table B.2: Renewable Energy Potentials and Their Utilisation in Indonesia .....	253
Table B.3: The Philippines’ Renewable Energy Installed Capacities (2011 to 2021) .....	254
Table B.4: Indonesia’s Renewable Energy Installed Capacities (2011 to 2021) .....	254
Table B.5: Renewable Energy Generation in the Philippines (2011 to 2021).....	256
Table B.6: Renewable Energy Generation in Indonesia (2011 to 2021).....	256
Table B.7: Energy Consumption in the Philippines (2011 to 2021).....	257
Table B.8: Energy Consumption in Indonesia (2011 to 2021).....	257
Table B.9: Emissions in the Philippines (2011 to 2021) .....	258
Table B.10: Emissions in Indonesia (2011 to 2021).....	259

# Chapter 1

## Transitioning from Fossil Fuels to Renewable Energy Sources

### 1.1. Introduction

Climate change is an important issue of our time. In recent years, climate change discourse has entered and generated stronger climate-conscious actions across wider spectrums of the society, including in the government and the business sectors. Negative realities such as worsening climate-induced disasters, declining agricultural yields, increasing inter-communal tension, disappearing species, worsening health, among others, have increasingly been attributed to climate change. Between 2017 and 2021, extreme weather had been consistently perceived as the topmost concerning global risk,<sup>1</sup> and remained the case in 2024.<sup>2</sup>

The securitisation of climate change had its beginnings from the findings within the epistemic community. Securitisation transforms a regular issue into a supreme priority, thereby authorising the initiation of extraordinary measures to address it in the name of security.<sup>3</sup> Established in 1988, the scientific Intergovernmental Panel on Climate Change (IPCC) made a case about global warming and its potential disastrous consequences. This narrative eventually convinced governments and brought countries together, leading to a high point in climate securitisation with the signing of the landmark United Nations Framework Convention on Climate Change (UNFCCC) in the Rio Earth Summit in 1992. Behind the global agreement, there are various climate change narratives that vouch for different approaches and conclusions. A prominent

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<sup>1</sup> WEF (World Economic Forum). (2021). *The Global Risks Report 2021, 16<sup>th</sup> Edition*. Coligny/Geneva: WEF. Retrieved from [https://www3.weforum.org/docs/WEF\\_The\\_Global\\_Risks\\_Report\\_2021.pdf](https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf)

<sup>2</sup> WEF (World Economic Forum). (2024). *The Global Risks Report 2024, 19<sup>th</sup> Edition*. Coligny/Geneva: WEF. Retrieved from [https://www3.weforum.org/docs/WEF\\_The\\_Global\\_Risks\\_Report\\_2024.pdf](https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2024.pdf)

<sup>3</sup> Buzan, B., Wæver, O., and de Wilde, J. (1998). *Security: A New Framework for Analysis*. Boulder; London: Lynne Rienner Publishers.

narrative that resounds with the IPCC's is the one introduced by Al Gore, which places emphasis on the scientific robustness of climate claims <sup>4</sup>

Since the 1992 UNFCCC, efforts to reduce greenhouse gas (GHG) emissions have been in the works in many countries. Among the various climate change mitigation initiatives, low-carbon energy transition is identified as a key strategy. The emphasis is given on the energy sector considering that it is the single largest source of GHG emissions in the world, making up of about 76 percent share in 2021, as seen in Figure 1.1 below. Mitigation interventions in the energy sector therefore play a pivotal role.

**Figure 1.1: Historical Greenhouse Gas Emissions based on Sector (1990 to 2021)**



Source: Climate Watch. (n.d.). *Historical GHG Emissions*. Retrieved from [https://www.climatewatchdata.org/ghg-emissions?breakBy=sector&end\\_year=2021&start\\_year=1990](https://www.climatewatchdata.org/ghg-emissions?breakBy=sector&end_year=2021&start_year=1990)

<sup>4</sup> Bushell, S., Buisson, G. S., Workman, M., and Colley, T. (2017). Strategic Narrative in Climate Change: Towards a Unifying Narrative to Address the Action Gap on Climate Change. *Energy Research & Social Science*, 28, 39 – 49.

Low-carbon energy transition entails developing and expanding renewable energy sources (wind, solar, hydro, tidal, geothermal, biomass, among others) to replace fossil fuels (oil, coal, and natural gas). While climate mitigation intervention in the energy sector is intended to be implemented in all countries, there were differing expectations regarding the share of obligation between developed and developing countries from the start. As stated in Article 3 Paragraph 1 and Article 4 Paragraph 1 of the 1992 UNFCCC, the global approach to solving climate change is governed by the common but differentiated responsibilities principle.<sup>5</sup> This means that developed countries are to take a lead in climate action by decarbonising their own energy systems, and are expected to extend financial and technological assistance to developing countries to enable them to do the same. The emphasis on assistance signifies that developing countries do not have sufficient capacity to transform their energy systems on their own.

Among the various types of renewable energy technologies available, solar and wind power has emerged as the mainstay of the global low-carbon energy transition revolution. In the late 1990s, solar and wind power technologies were still considered a lot costlier than fossil fuels. In view of climate agenda, the push for their expanded use had affected developed and developing countries differently, with the former showing more progress. This is because developed countries such as Denmark, Germany, and Spain, had begun to develop these renewable energy technologies since the 1970s. As such, they already possessed the technological basis for low-carbon transition when the 1992 UNFCCC was signed.

On the contrary, most developing countries had a starkly contrasting experience. Lacking their own research and development (R&D) and industrial capacity, most developing countries were dependent on producing countries to avail themselves of these technologies. In many instances,

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<sup>5</sup> UN (United Nations). (1992). *United Nations Framework Convention on Climate Change*. Retrieved from [https://unfccc.int/files/essential\\_background/background\\_publications\\_htmlpdf/application/pdf/conve ng.pdf](https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conve ng.pdf)

assistance from developed countries acted as the main modality to encourage low-carbon transition in developing countries.

The 15<sup>th</sup> United Nations Climate Change Conference of Parties (COP15) in 2009 in Copenhagen further highlighted this aspect by emphasising that developed countries should assist climate actions in developing countries by providing them with adequate, predictable and sustainable financial resources, technology development and transfer, and capacity building.<sup>6</sup> This was manifested in developed countries pledging USD100 billion per year by 2020 to enhance climate mitigation in developing countries.<sup>7</sup>

The emphasis on technological innovation as the basis for low-carbon energy transition is consistent with the basic tenet within the sociotechnical transition approach which this study uses as the basis of its enquiry. Beyond technological innovation, the wider literature suggests other influencing factors such as, among others, governance and policies, resource endowments, environmental repercussions of renewable energy projects, renewable energy demand and investment climate, public acceptance, existing power generation system, economic contributions, energy security consideration, prices and culture.<sup>8</sup>

The importance of innovation capability is especially relevant to the introduction of newer types of renewable energy technology such as the modern wind power technology (in contrast to windmills), the modern solar photovoltaic (PV) technology, and tidal energy technology, into an

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<sup>6</sup> UNFCCC (United Nations Framework Convention on Climate Change). (2009). *Report of the Conference of the Parties on Its Fifteenth Session, held in Copenhagen from 7 to 19 December 2009*. Retrieved from <https://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf#page=4>

<sup>7</sup> UNFCCC. *Report of the Conference of the Parties on Its Fifteenth Session*.

<sup>8</sup> See for example: Fatima, N., Li, Y., Ahmad, M., Jabeen, G., and Li, X. (2021). Factors Influencing Renewable Energy Generation Development: A Way to Environmental Sustainability. *Environmental Science and Pollution Research*, (28)(37), 51714 – 51732; Zhao, Z-Y., and Chen, Y-L. (2018). Critical Factors Affecting the Development of Renewable Energy Power Generation: Evidence from China. *Journal of Cleaner Production*, 184, 466 – 480; Aguirre, M., and Ibikunle, G. (2014). Determinants of Renewable Energy Growth: A Global Sample Analysis. *Energy Policy*, 69, 374 – 384; Xu, X., Wei, Z., Ji, Q., Wang, C., and Gao, G. (2019). Global Renewable Energy Development: Influencing Factors, Trend Predictions and Countermeasures. *Resources Policy*, 63, 101470; and Shortall, R. and Kharrazi, A. (2017). Cultural Factors of Sustainable Energy Development: A Case Study of Geothermal Energy in Iceland and Japan. *Renewable and Sustainable Energy Reviews*, 79, 101–109.

existing energy system that has been using certain other types of technology like fossil-fuel based ones. For more mature renewable energy technologies such as hydropower, technological innovation capability is arguably less of an important determinant, especially if such technologies have been part of the existing energy system. For example, developing countries like Nepal and Bhutan were able to achieve 100 percent renewable energy in their power generation mix<sup>9</sup> primarily by extending their longstanding heavy use of hydropower technology to replace their much smaller share of diesel-based generators.<sup>10</sup> Unlike Nepal and Bhutan that are endowed with huge hydropower potential, other developing countries may have different characteristics that necessitate them to tap into the newer types of renewable energy technology for low-carbon energy transition. While acknowledging the importance of cases like Nepal and Bhutan, this study is mainly concerned with the adoption of newer types of renewable energy technology as part of the response to the global low-carbon energy transition agenda.

At this juncture, it is evident therefore that low carbon energy transition agenda presents a challenge for developing countries from the outset. Unlike developed countries that can reap the benefits of homegrown renewable energy R&D and industry, low-carbon energy transition in most developing countries first and foremost came across as an onerous undertaking. This is especially the case when fossil fuels still served their energy needs sufficiently.

Despite such challenges, developing countries still chose to embark on low-carbon energy transition. Some of them even implemented the agenda faster than others. For example, to facilitate renewable energy development, the Philippines passed the Renewable Energy Act in

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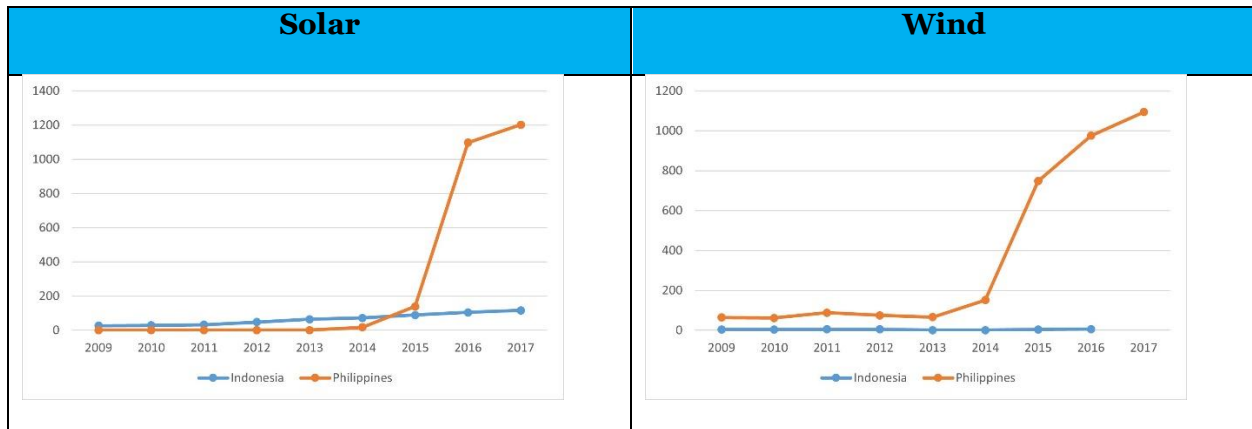
<sup>9</sup> See for example: IRENA (International Renewable Energy Agency). (2024b). *Energy Profile: Nepal*. Abu Dhabi: IRENA. Retrieved from [https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical\\_Profiles/Asia/Nepal\\_Asia\\_RE\\_SP.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Asia/Nepal_Asia_RE_SP.pdf); IRENA (International Renewable Energy Agency). (2024a). *Energy Profile: Bhutan*. Abu Dhabi: IRENA. Retrieved from [https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical\\_Profiles/Asia/Bhutan\\_Asia\\_RE\\_SP.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Asia/Bhutan_Asia_RE_SP.pdf)

<sup>10</sup> Gulagi, A., Pathak, S., Bogdanov, D., and Breyer, C. (2021). Renewable Energy Transition for the Himalayan Countries Nepal and Bhutan: Pathways towards Reliable, Affordable and Sustainable Energy for All. *IEEE Access*, 9, 84520 – 84544.

2008. By contrast, a similar Law is still in the works in Indonesia at the time of this dissertation writing.

The Philippines and Indonesia present an interesting case to examine not only because of the different timings in the formulation of their renewable energy laws, but also in the stark contrast in their solar and wind power development between 2009 and 2017. As shown in Figure 1.2, the Philippine wind and solar productions rose exponentially in 2015 despite a similar start with Indonesia, and despite both countries sharing many similarities in terms of, among others, population growth, economic and energy demand growths, geographical location, renewable energy potential, and vulnerability to climate-induced events. These similarities imply that both countries have similar compelling reasons to expand renewable energy sources and implement the low-carbon energy transition agenda.

**Figure 1.2: Solar and Wind Energy Productions in the Philippines and Indonesia (2009 to 2017)**



Source: IRENA (International Renewable Energy Agency). (2018a). *Renewable Energy Statistics 2018*. Abu Dhabi: IRENA. Retrieved from [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jul/IRENA\\_Renewable\\_Energy\\_Statistics\\_2018.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jul/IRENA_Renewable_Energy_Statistics_2018.pdf)

As such, the statistical observation shown in Figure 1.2 presents a puzzle as it suggests that the Philippines had put in place measures that catalysed renewable energy development earlier than Indonesia.

## 1.2. Research Questions

Against such backdrop, using the Philippines and Indonesia as case studies, this dissertation aims to examine the following questions: *Why do developing countries still take up the low-carbon energy transition agenda despite financial and technological hurdles, and why do some developing countries implement the agenda faster than others?*

## 1.3. Hypotheses

The following hypotheses were formulated to answer the research questions.

**H1:** State's evaluation of the benefits of renewable energy development for its economic and energy security interests, in view of factors such as resource endowments, influences State's decision to pursue low-carbon energy transition agenda.

**H2:** State involvement in the energy sector influences the extent of its intervention, which can either hinder or facilitate low-carbon energy transition depending on its interests and priorities.

**H3:** State relation with the private sector in the specific industry in the energy sector can either hinder or facilitate low-carbon energy transition, depending on whether the State and the private sector share the same interests in renewable energy development.

## 1.4. Variables

This study accords the State a key role in low-carbon energy transition. This is because the State, which encompasses political leaders, government agencies, state-owned enterprises, government-linked institutions, and policymakers, is in the position to set the national agenda in response to the global call for low-carbon energy transition.

Such response is influenced by both endogenous and exogenous factors.<sup>11</sup> While the State responding to endogenous factors is intuitive, exogenous factors can at times affect the State as evident in the responses to the 1973 oil crisis. The crisis, which saw the global oil price surge by almost 400 percent, from about USD3 per barrel in 1973 to nearly USD12 per barrel in 1974,<sup>12</sup> prompted countries to modify their energy policies. Likewise, the global environmental and climate change processes including the 1992 UNFCCC and the 2015 Paris Agreement affected energy policies in many countries. Stadelmann and Castro observed that international factor influenced the development of renewable energy policies in 112 developing countries from 1998 to 2009.<sup>13</sup>

Given such context, this study thus assumes that the combination of endogenous and exogenous factors had different effects on the Philippines and Indonesia, and these different effects can then explain why both countries decided to take up the low-carbon energy transition agenda, when they did so, and why the Philippines made better progress in developing renewable energy sources compared to Indonesia. This study carries out the investigation by applying historical institutionalism, and the study design is adapted from a comparative study by Parry (2019) that applies similar conceptual framework to examine the implementation of the European Union's renewable energy targets in France's and the United Kingdom's electricity sectors.<sup>14</sup> Having examined the development of the electricity sector in both countries from institutionalism perspective, the study essentially looked at how the State involvement in the sector and the State relation with the private sector in the specific industry in the energy sector throughout history had

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<sup>11</sup> See for example: Frieden J., and Martin L. (2002). International Political Economy: Global and Domestic Interactions. In I. Katznelson and H. Milner. (eds.) *Political Science: The State of the Discipline*. New York: W.W. Norton, pp. 118 – 146; Lake, D. A. (2009). Open Economy Politics: A Critical Review. *The Review of International Organizations*, 4, 219 – 244.

<sup>12</sup> Arihan, C. (2021). Oil Crisis (Oil Price Revolution) of 1973 and the United States' Response to the Crisis: The International Energy Agency. *Journal of Management Policy and Practice*, (22)(1), 24 – 33.

<sup>13</sup> Stadelmann, M., and Castro, P. (2014). Climate Policy Innovation in the South-Domestic and International Determinants of Renewable Energy Policies in Developing and Emerging Countries. *Global Environmental Change*, 29, 413 – 423.

<sup>14</sup> Parry, N. (2019). *The Europeanization of the Renewable Energy Directive in France and the United Kingdom*. PhD dissertation, The University of Melbourne.

affected the State's interpretation and implementation of the European Union's Renewable Energy Directive at the national level. Accordingly, this study identifies State involvement in the energy sector and State relation with the private sector in the specific industry in the energy sector as the **independent variables**.

### **1. State involvement in the energy sector**

State involvement in the energy sector is defined as the extent to which the State has ownership over the production outputs in the sector. State involvement can manifest in various forms: in state-owned enterprises having direct investments and dealings with the day-to-day operations of energy production, in State having monopoly and control over the exploration and production of certain or all energy sources, in State lending support to energy production through, for example, a geographical survey to identify energy potential, as well as in State having regulatory and oversight functions in the sector.

These different forms of involvement signify different levels of ownership. For example, State that has monopoly and control in the energy sector has deeper and stronger engagement in the sector compared to the State that only exercises regulatory and oversight functions. The contrast is observed clearly between a country that is governed by dictatorship and a country that is more market-based.

The extent of State involvement in the energy sector is not a static phenomenon. Historical development can affect State involvement, and historical contexts can influence a country's preference for the extent of State involvement in the sector. For example, the Philippines used to see thriving private companies in its energy sector, but it changed when President Marcos instituted the Martial Law in 1972 and nationalise electricity companies. In such instance, State became strongly involved in the energy sector. This did not last for long, however, because the subsequent Corazon Aquino administration was eager to reverse Marcos-era policies and re-privatise the sector. The corrupt images associated with Marcos' presidency and the Aquino

administration's failure to address electricity crisis fostered a widespread perception and acceptance of the private sector being a better agency in the electricity industry. Following this development, the present-day State involvement in the sector has become reduced to mainly regulatory functions.

Considering the centrality of the State in responding to the global low-carbon energy transition agenda, knowing to what extent the State is involved in the sector will inform how it will respond to the agenda. The assumption is that the more involved the State is, the more likely the energy sector is shaped and influenced by State's strategic interests and priorities. And the more influence the State has in the energy sector, the more difficult or the easier the adoption of low-carbon energy transition will be depending on how well it fits the State's strategic interests and priorities.

Such strategic interests and priorities can encompass a wide range of issues, but this study identifies economic and energy security objectives as the ones having most relevance to the functions of the energy sector. State evaluation of low-carbon energy transition agenda in view of these interests, which are arguably shaped by historical context involving exogenous and endogenous factors such as the role of resource endowments and how they changed over time, can influence State's decision to implement low-carbon energy transition.

## **2. State relation with the private sector in the specific industry in the energy sector**

An examination of State relation with the private sector in the specific industry in the energy sector is important because private companies are often involved in energy provision. The extent of their involvement, however, can be influenced by its relation with the State. The relationship can be complementary, synergistic, or somewhat antagonistic. The private sector may enjoy considerable autonomy, relatively free from State interventions, in making business decisions including in its investment choice of energy sources. In other instances, as often seen in regulated

markets, the private sector's decisions and involvement may be guided or dictated by the State's agenda. In other instances, the State may intervene deep into the sector by excluding certain companies, such as foreign-owned ones, from taking part in the sector. Yet in other instances, the State may pro-actively provide support and incentives to encourage private companies to move to a certain direction to meet the State's objectives.

The importance of the private companies' involvement in the energy sector is also related to their massive capital, specialised expertise, and overall contributions to the economy. These attributes give them certain power to exert their influence in the sector, primarily guided by their profit-making interests. An examination of State relation with the private sector in the specific industry in the energy sector, therefore, is essentially an assessment of power dynamics between the two.

In view of such relation, the choice of energy sources is likely to follow market mechanisms if the State relation with the private sector allows for considerable autonomy for private companies to make their own business decisions, or if the private companies can counterbalance State power. Conversely, the choice of energy sources is likely to follow State agenda if the State relation with the private sector is dominated more by the State. Following the same logic, the adoption and implementation of the low-carbon energy transition agenda is likely to be easier if the State's interests and priorities to pursue the agenda converge with the private sector's interests.

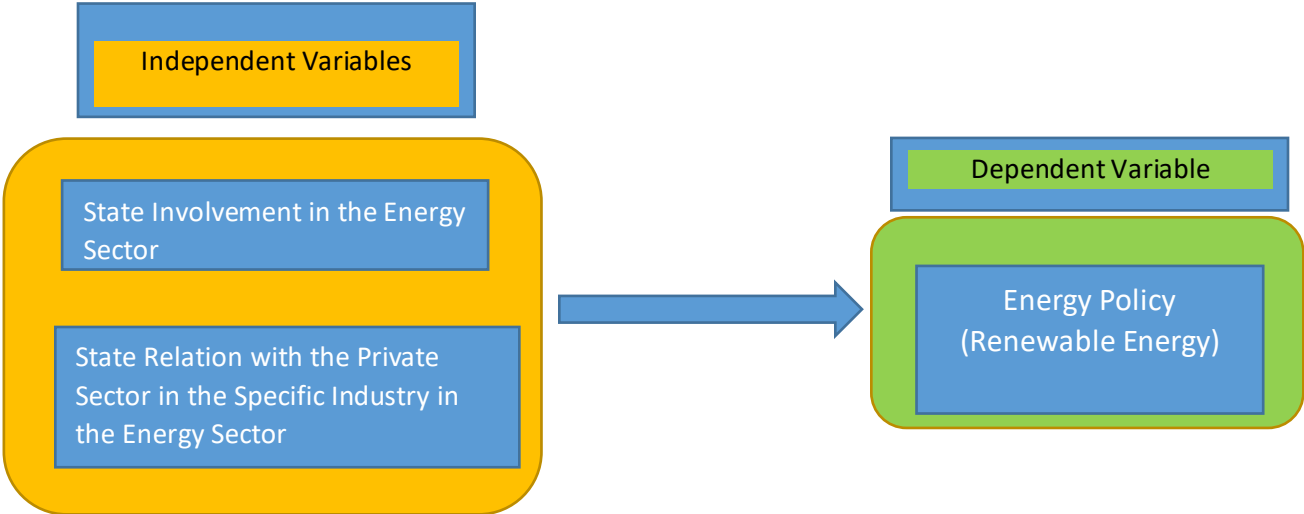
Like State involvement in the energy sector, State relation with the private sector in the sector is also not a static phenomenon and is shaped by historical processes. Understanding how such relation has evolved over time will inform how likely a State will adopt and implement low-carbon energy transition, and how likely its future progress will be.

The corresponding **dependent variable** being examined is the transformation of *energy policies* leading to renewable energy development. Considering that low-carbon energy transition is essentially about the expansion of renewable energy sources to replace fossil fuels, this study thus examines the impact of State involvement in the energy sector and State relation with the

private sector on the evolution of energy policies and corresponding choice and use of energy sources, which then led to the mainstreaming of renewable energy development in the country, and subsequently, the phasing out of fossil fuels.

Figure 1.3 reflects the simple diagrammatic representation of the relation between independent variables and dependent variable used in this study.

**Figure 1.3: Independent-Dependent Variable Relation**



*Source: Author*

The application of historical institutionalism concepts in this study unpacks the dynamics of the contexts that shaped a country’s economic and energy security interests, their evolution over time, the impacts on the energy sector, and the eventual influence on a developing country’s decision to implement low-carbon energy transition agenda. This necessarily includes an examination of political leaders’ responses to international climate processes given that low-carbon energy transition is first and foremost an agenda introduced by a global process in which the State is directly involved, for example through the UNFCCC forum, instead of a homegrown one.

Historical institutionalism’s examination of historical processes contrasts with many existing analyses that take on shorter time frames to examine contemporary dynamics relating to low-

carbon energy transition. Guided primarily by carbon lock-in concept,<sup>15</sup> such analyses generally aim to answer why the transition to renewable energy sources is a very slow process despite a burning planet, and entail a focused discussion on fossil fuel interests vis-à-vis renewable energy development agenda. While this aspect is important, the decoupling of the ongoing low-carbon energy transition from the energy sector's past trajectory runs the risk of excluding important factors and processes that can explain more sufficiently why a certain developing country accepts low-carbon energy transition agenda more readily than others. This is because a decision to implement low-carbon energy transition is situated within an existing system or institution that, according to Hall and Taylor, sets the periphery of actions and their possible outcomes.<sup>16</sup> In other words, State's response to the global call for low-carbon energy transition is not happening in the vacuum, but within the limits of existing system's paradigm and practices. Such limits, however, may change following institutional changes, and may subsequently affect State's ability and interests in pursuing low-carbon energy transition agenda. A process tracing that assesses what has changed and what has endured provides a robust and comprehensive understanding of the State's decision to embark on low-carbon energy transition agenda and its progress.

In addition to applying historical institutionalism, this thesis is also informed by sociotechnical transition perspective that is widely used to examine energy transition. More specifically, this study refers to the Multi-Level Perspective (MLP) framework within the sociotechnical transition literature, which identifies three levels of analysis namely niche-innovations, sociotechnical regime, and sociotechnical landscape.<sup>17</sup> Niche-innovations refers to the level where new technologies are invented. In the context of low-carbon energy transition, niche-innovations refers to the invention of newer types of technology such as solar, wind, and tidal power.

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<sup>15</sup> Unruh, G. C. (2000). Understanding Carbon Lock-in. *Energy Policy*, 28, 817 – 830.

<sup>16</sup> Hall, P. A., and Taylor, R. (1996). Political Science and Three New Institutionalisms. *Political Studies*, (44)(5), 936 – 957.

<sup>17</sup> Rip, A. and Kemp, R. (1998). Technological Change. In S. Rayner and E. L. Malone. (eds.) *Human Choice and Climate Change, Vol. II, Resources and Technology*. Columbus, Ohio: Battelle Press, pp. 327 – 399

Sociotechnical regime refers to the current technology and its surrounding systems, and the broader society including users, industry, and policymakers. Sociotechnical landscape refers to the wider environment such as the economic and political systems and cultural practices, among others, within which sociotechnical regime and niche-innovations are situated. By focusing on State involvement in the energy sector and State relation with the private sector, and their effects on energy policy and choice of energy sources, this thesis therefore examines the mechanism of change within the sociotechnical regime level of the MLP framework.

## 1.5. Research Design and Methodology

Mixed research methods were selected for this study. The selected research design was formulated through a case study using longitudinal and cross-sectional approaches within comparative historical analysis framework; and archival, secondary data and interviews for data collection methods.

### 1.5.1. Case Study

To enable an in-depth investigation of the different contexts and interactions that influence developing countries' decisions to implement low-carbon energy transition, this dissertation employs a qualitative comparative approach using the Philippines and Indonesia as case studies. The design for the comparative study began with a statistical observation on the Philippines' relative progress in developing solar and wind energy sources from 2014 onwards despite a similar start with Indonesia in the preceding years. This comparative study is intended to examine why one developing country shows more enthusiasm and commitment to develop renewable energy sources despite the technical and financial challenges that most developing countries are facing. The comparative design also responds to the gaps identified in existing energy transition

literature about a lack of comparative work<sup>18</sup> and how such comparative analyses are important to understand the variation in the use of low-carbon energy technologies across countries,<sup>19</sup> and how such knowledge is needed to inform the governance of energy transition for climate change mitigation.<sup>20</sup> This dissertation's comparative work thus fills in the gap in the existing literature and contributes to knowledge building. The choice of the Philippines and Indonesia as case studies is intended neither to represent all developing countries nor to formulate a generalised theory. Rather, it aims to exemplify the dynamics in developing countries by illustrating in detail the factors that have led to the responses to low-carbon energy transition agenda in both countries.

The rigour of a comparative work is reflected in case selection that is mindful of similarities present in as many explanatory variables as possible while differences observed in a dependent variable.<sup>21</sup> Based on such criteria, the Philippines and Indonesia present fitting cases for the following reasons. First, both the Philippines and Indonesia are developing countries that share similar attributes like large population sizes, political systems, economic growth trajectories, energy demand growth, vulnerability to natural disasters, and geographical characteristics. These attributes hypothetically place them in a similar position when it comes to assessing the low-carbon energy transition agenda.

Second, the Philippines and Indonesia are the two most populous democracies in Southeast Asia. The regional population that was recorded at 676 million people in mid-2022 accounted for about

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<sup>18</sup> Geels, F.W., Kern, F., Fuchs, G., Hinderer, N., Kungl, G., Mylan, J., Neukirch, M., and Wassermann, S. (2016). The Enactment of Socio-Technical Transition Pathways: A Reformulated Typology and A Comparative Multi-Level Analysis of the German and UK Low-Carbon Electricity Transitions (1990–2014). *Research Policy*, (45)(4), 896 – 913.

<sup>19</sup> See: Lipp, J. (2007). Lessons for Effective Renewable Electricity Policy from Denmark, Germany and the United Kingdom. *Energy Policy*, 35, 5481 – 5495; Schneider, M., Froggatt, A., and Thomas, S. (2011). *Nuclear Power in a Post-Fukushima World: 25 Years after the Chernobyl Accident*. Washington, D.C.: Worldwatch Institute.

<sup>20</sup> GEA (Global Energy Assessment). (2012). *Global Energy Assessment: Toward a Sustainable Future*. Cambridge, UK; New York, USA: Cambridge University Press, and Laxenburg: International Institute for Applied Systems Analysis.

<sup>21</sup> Przeworski, A., and Teune, H. (1970). *The Logic of Comparative Social Inquiry*. New York: Wiley.

8.5 percent of total global population, and the number is expected to reach 742.0 million by mid-2035 and 786 million by mid-2050.<sup>22</sup> Within the close to 700 million Southeast Asian population, Indonesia had a total population of more than 270 million people whereas the Philippines had over 110 million population in 2021, with the combined numbers accounting for close to 60 percent of total population in Southeast Asia.<sup>23</sup> Despite a declining trend between 1961 and 2021, the annual population growth rates in the Philippines and Indonesia in 2021 stood at 1.3 percent and 1 percent respectively, and these were higher than the world's average of 0.9 percent.<sup>24</sup>

Third, the big population size and the relatively high population growth were accompanied by expanding Gross Domestic Products (GDPs). In 2022, Indonesia was the biggest economy in Southeast Asia that accounted for about 36.4 percent of the regional, whereas the Philippines' made up of about 11.2 percent.<sup>25</sup> The different economy size does not negate the justification for choosing the two countries given that what matters more directly to changes in energy demand is economic growth instead of the size of the economy. In this regard, the Philippines and Indonesia had considerably high average annual GDP growth rates that stood at 6.4 percent and 5.4 percent respectively between 2010 and 2019, which were higher than the world's average at 3.2 percent during the same period.<sup>26</sup> In 2022, the Philippines registered 7.6 percent growth rate, which was among the highest in the region, up from 5.7 percent in the previous year whereas Indonesia's GDP growth rate likewise increased from 3.7 percent in 2021 to 5.3 percent in 2022.<sup>27</sup> The rising population and the growing GDP lead to increasing energy demands, which are projected to rise

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<sup>22</sup> PRB (Population Reference Bureau). (n.d.). *Southeast Asia*. Retrieved from <https://www.prb.org/international/geography/southeast-asia/>

<sup>23</sup> World Bank. (n.d.a.). *World Bank Open Data*. Retrieved September 29, 2022, from <https://data.worldbank.org/>

<sup>24</sup> World Bank. *World Bank Open Data*.

<sup>25</sup> ASEAN Secretariat. (2023). *ASEAN Key Figures 2023*. Jakarta: ASEAN Secretariat. Retrieved from <https://asean.org/serial/asean-key-figures-2023/>

<sup>26</sup> World Bank. *World Bank Open Data*.

<sup>27</sup> ASEAN Secretariat. *ASEAN Key Figures 2023*.

by 85 percent and 137 percent in the Philippines' and Indonesia's electricity production respectively in 2025 compared to the 2014 levels.<sup>28</sup>

Fourth, the need to meet growing energy appetite is accompanied by climate concerns. Southeast Asia is projected to experience the most devastating impacts of heat extremes,<sup>29</sup> and it has seen an increasing trend of heavy rainfalls. The anticipated higher precipitation rate is likely to result in more frequent flooding, which consequences will be disastrous considering that many people live in low-lying deltas.<sup>30</sup>

The same situation is facing the Philippines and Indonesia. The Philippines is often anecdotally referred as the hypermarket of disasters, and Indonesia the supermarket of disasters.<sup>31</sup> The 2021 World Risk Index, which measures the exposure to extreme natural events and social vulnerability, ranked the Philippines the eighth country most at risk in the world, while Indonesia was at the thirty eighth position.<sup>32</sup> Similarly, the 2021 Climate Risk Index, which measures the human and economic impacts of weather-related loss events such as storms, floods, heat waves, among others, ranked the Philippines the seventeenth most vulnerable country in the world while Indonesia was ranked fourteenth.<sup>33</sup> The imperative to balance growing energy demand and climate concerns thus makes a case for low-carbon energy transition in both countries.

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<sup>28</sup> IRENA. (2018b). *Renewable Energy Market Analysis: Southeast Asia*. Abu Dhabi: IRENA.

<sup>29</sup> ADB (Asian Development Bank). (2017). *A Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific*. Metro Manila: ADB.

<sup>30</sup> Nicholls, R.J., Brown, S., Hanson, S. and Hinkel, J. (2010). *Economics of Coastal Zone Adaptation to Climate Change, World Bank Discussion Papers No. 10*. Washington, D.C.: World Bank. Retrieved from <https://eprints.soton.ac.uk/202135/>

<sup>31</sup> Tang, A. (2015, June 30). *After Decade of Disasters, U. N. Shifts its Asia Operations*. Reuters. Retrieved from <https://www.reuters.com/article/cnews-us-asia-disaster-un-idCAKCN0PA03220150630>

<sup>32</sup> Bündnis Entwicklung Hilft. (2021). *World Risk Report 2021*. Berlin: Bündnis Entwicklung Hilft and Bchum: Ruhr University Bochum – Institute for International Law of Peace and Armed Conflict (IFHV). Retrieved from [https://www.welthungerhilfe.org/news/publications/detail?tx\\_cart\\_product%5Bproduct%5D=1986&cHash=a488bbcd0e7b8b93a3a51ba0f74bbb73](https://www.welthungerhilfe.org/news/publications/detail?tx_cart_product%5Bproduct%5D=1986&cHash=a488bbcd0e7b8b93a3a51ba0f74bbb73)

<sup>33</sup> Eckstein, D., Künzel, V., and Schäfer, L. (2021). *Global Climate Risk Index 2021*. Bonn: Germanwatch e.V. Retrieved from [https://www.germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021\\_2.pdf](https://www.germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021_2.pdf)  
The list of the countries in descending order is as follows: Myanmar (2<sup>nd</sup>); the Philippines (4<sup>th</sup>); Thailand

Fifth, the Philippines and Indonesia are both archipelagos that share similar geographical locations. Geography is critical to renewable energy development because renewable energy potential depends on local geography. In terms of potential, the Philippines has 58.11 Gigawatts (GW) of solar, 93.987GW of wind, 0.365GW of geothermal, 655.034GW of hydropower, and 0.364GW of biomass across its three main islands of Luzon, Visayas, and Mindanao,<sup>34</sup> whereas Indonesia has 532.6GW of solar, 9.3GW of wind (onshore), 29.5GW of geothermal, 75.0GW of hydropower, and 32.7GW of bioenergy across the country.<sup>35</sup> Despite the difference in territorial sizes, which affects the aggregate renewable energy potential in each country, both countries demonstrably have sizeable renewable energy potential to develop.

While the resource endowments are promising, the archipelagic characteristic of the Philippines and Indonesia renders both countries facing similar issues relating to grid connectivity. This poses a serious concern for Indonesia given the uneven spread of population across the sprawling archipelago and related land availability issues that create a mismatch between the centres of energy demand and renewable energy supply. In more populous islands like Java, Bali and Sumatra, land constraints render the development of large-scale renewable energy projects more challenging compared to the less populous islands in Eastern part of Indonesia. While the development renewable energy projects at larger scales is more possible in the latter due to better land availability, the transmission of the electricity outputs to the more populous islands in western part of Indonesia presents both technical and financial challenges given grid connectivity

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(9<sup>th</sup>); Vietnam (13<sup>th</sup>); Cambodia (14<sup>th</sup>); Laos PDR (52<sup>nd</sup>); Indonesia (72<sup>nd</sup>); Malaysia (116<sup>th</sup>); Brunei Darussalam (176<sup>th</sup>); Singapore (179<sup>th</sup>).

<sup>34</sup> NREB (National Renewable Energy Board). (2022). *National Renewable Energy Program 2020-2040*. Taguig City: NREB. Retrieved from [https://www.doe.gov.ph/sites/default/files/pdf/renewable\\_energy/nrep\\_2020-2040\\_0.pdf?withshield=1](https://www.doe.gov.ph/sites/default/files/pdf/renewable_energy/nrep_2020-2040_0.pdf?withshield=1)

<sup>35</sup> IRENA. (2017). *Renewable Energy Prospects: Indonesia, a REmap Analysis*. Abu Dhabi: IRENA.

issue. This explains why renewable energy projects in Indonesia are usually in small scales or found in more remote areas intended for rural electrification.<sup>36</sup>

In contrast, in the Philippines, while the aggregate national population density is three times of Indonesia,<sup>37</sup> the breakdown of the population density at the regional level revealed lower density at lower than 500 persons per square kilometre of land (except for the National Capital Region and Calabarzon region that registered higher numbers) in 2020<sup>38</sup> compared to Indonesia's Java Island where the population density in its six regions provinces stood at around 1000 persons per square kilometre of land (except for the Jakarta Capital Region that registered higher number) in 2021.<sup>39</sup> The total national population density that stood at 142 in the same year again highlights the disparity in population sizes across Indonesia's islands. Thus, while land constraint is already posing an issue in Indonesia, it is yet to the same extent in the Philippines although the country is projected to also face a similar challenge in the future.<sup>40</sup> Similarly, while both countries are facing grid connectivity problems, the much larger territorial size of Indonesia makes inter-island transmission issues arguably more challenging in Indonesia compared to the Philippines.

In addition, this study also observed a major difference in terms of fossil fuel endowment, including coal reserves, between the two countries. As of 2021, the Philippines' coal reserves stood

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<sup>36</sup> Ferdyson, F. and Windarta, J. (2023). Overview Pemanfaatan dan Perkembangan Sumber Daya Energi Surya Sebagai Energi Terbarukan di Indonesia. *Jurnal Energi Baru & Terbarukan*, (4)(1), 2 – 6

<sup>37</sup> World Bank. (n.d.b). *Population Density (people per sq. km of land area) - Philippines, Indonesia*. Retrieved August 30, 2024, from <https://data.worldbank.org/indicator/EN.POP.DNST?locations=PH-ID>

<sup>38</sup> See: Philippines Statistics Authority. (2021, July 23). *Highlights of the Population Density of the Philippines 2020 Census of Population and Housing (2020 CPH)*. Retrieved from <https://psa.gov.ph/statistics/population-and-housing/node/164857>

<sup>39</sup> Dinas Komunikasi dan Informatika. (2022, December 9). *Persoalan Kepadatan Penduduk Jadi Perhatian BPS Jatim*. Retrieved from <https://kominfo.jatimprov.go.id/berita/persoalan-kepadatan-penduduk-jadi-perhatian-bps-jatim#:~:text=Kepadatan%20penduduk%20di%20Pulau%20Jawa,sebesar%201.180%20jiwa%20per%20km2>.

<sup>40</sup> See: World Bank. (2022). *Offshore Wind Roadmap for the Philippines*. Washington, DC: World Bank. Retrieved from <https://documents1.worldbank.org/curated/en/099225004192234223/pdf/P1750040b777da0c30935a0e2aa346f4e26.pdf> ; Responsible Energy Initiative Philippines. (2024). *Renewable Energy to Responsible Energy: A Call to Action*. Retrieved from <https://library.fes.de/pdf-files/bueros/philippenen/20989.pdf>

at 349.61 million metric tonnes,<sup>41</sup> whereas Indonesia's was recorded at 110,069.91 million tonnes.<sup>42</sup> While acknowledging that such difference matters, this dissertation argues that fossil fuel endowment itself does not sufficiently explain why the Philippines was able to expand its renewable energy uses relatively rapidly. In addition, the presence of big coal reserves in a country does not automatically stifle renewable energy development and low-carbon energy transition. A preliminary study by Sembiring that examined the state of renewable energy shares in major coal-producing countries Russia, Indonesia, Poland, Australia, Germany, China, the United States, and India, corroborates this argument.<sup>43</sup> The study observed that while Russia, like Indonesia, did not show significant progress in renewable energy expansion, other countries like Poland, Australia, Germany, China and the United States have increased their renewable energy share and decreased their coal share. India, on the other hand, has increased both its coal share and the share of newer types of renewable energy source simultaneously. This observation thus suggests that big coal reserves, and its supposed important role in a country, do not necessarily act as a stumbling block to low-carbon energy transition. Rather, countries are doing low-carbon energy transition at their own pace for reasons specific to their contexts. Thus, while the Philippines and Indonesia admittedly differ in their fossil fuel endowment, this needs to be accounted for in the analysis within their specific contexts rather than being pre-determined as a defining causal factor explaining the different progress in renewable energy expansion in both countries.

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<sup>41</sup> Divina Gracia L. Del Prado. (2023, November 23). *Reserves of Coal, Oil, Natural Gas, and Condensate Amounted to PhP 594.22 Billion in 2022*. Philippine Statistics Authority. Retrieved from <https://psa.gov.ph/content/reserves-coal-oil-natural-gas-and-condensate-amounted-php-59422-billion-2022#:~:text=The%20valuation%20of%20the%20energy,10%20percent%20social%20discount%20rate.&text=Coal%20reserves%20in%202022%20was,365.71%20million%20MT%20in%202021>.

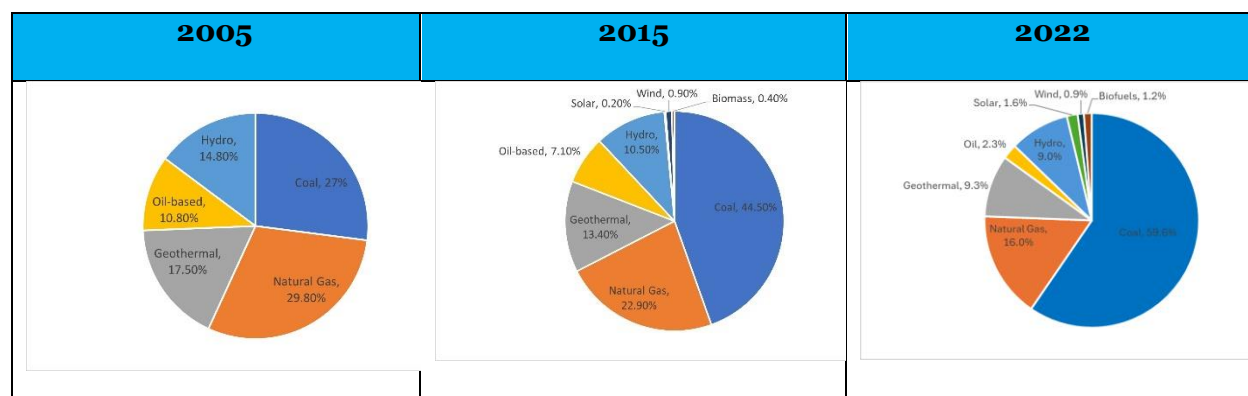
<sup>42</sup> Center for Mineral Coal and Geothermal Resources. (2022). *Indonesian Minerals, Coal, and Geothermal Resources and Reserves 2021*. Bandung: Center for Mineral Coal and Geothermal Resources. Retrieved from <https://geologi.esdm.go.id/storage/publikasi/BZndhEYcRYSGJHh3XKSnEVsrE3HwbzDohxcs3veV.pdf>

<sup>43</sup> Sembiring, M. (2020). *Domestic Coal: A Hindrance to Renewable Energy Development?* NTS Insight No. IN20-01, Singapore: RSIS Centre for Non-Traditional Security Studies (NTS Centre), Nanyang Technological University.

Against the backdrop of similar characteristics, while also acknowledging some country-specific differences, the Philippines and Indonesia are in a comparable position to consider increased use of renewable energy sources.

Renewable energy development is a precursor to low-carbon energy transition considering that it is intended to replace fossil fuels. The extent to which low-carbon energy transition is happening can thus be observed from the changing shares of fossil fuel and renewable energy sources in the national energy mix. The overall changes which show the incorporation of solar and wind power in the Philippine national energy mix from 2005 to 2022 are illustrated in Figure 1.4 below.

**Figure 1.4: Power Generation Mix in the Philippines (2005 to 2022)**



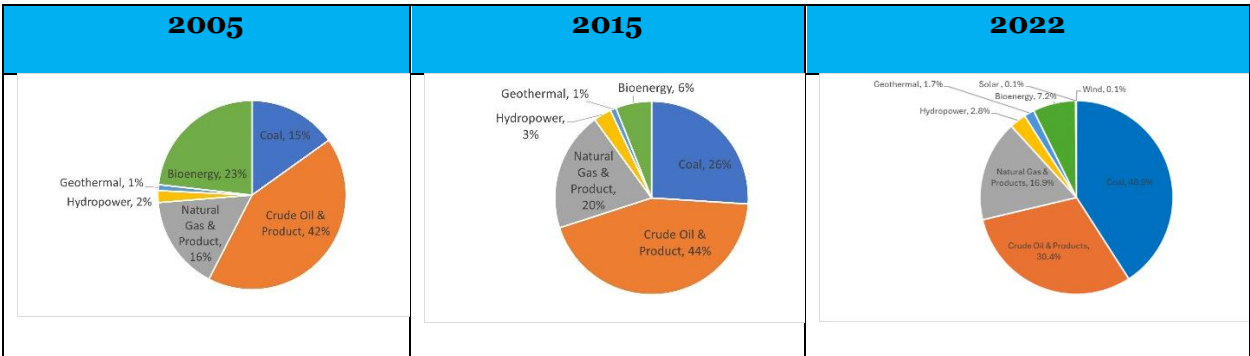
Source: DOE (Department of Energy of the Philippines). (n.d.a). *Power Generation Mix*. Retrieved September 29, 2022, from <https://www.doe.gov.ph/energy-statistics?q=energy-resources/powermix&withshield=1ve> (for 2005 to 2015 data); DOE. (n.d.c). *2022 Key Energy Statistics*. Retrieved August 22, 2024, from [https://doe.gov.ph/sites/default/files/pdf/energy\\_statistics/20230725\\_2021-2022%20key%20energy%20stat\\_pocket%20size.pdf](https://doe.gov.ph/sites/default/files/pdf/energy_statistics/20230725_2021-2022%20key%20energy%20stat_pocket%20size.pdf) (for 2022 data)

Two observations stand out from Figure 1.4. First is the increasing share of coal from 27 percent in 2005 to 44.5 percent in 2015 to 59.6 percent in 2022, and the increasing share of solar from nothing in 2005 to 0.2 percent in 2015 to 1.6 percent in 2022, and the increasing share of wind from nothing in 2005 to 0.9 percent in 2015. Second is the decreasing share of geothermal from 17.5 percent in 2005 to 13.4 percent in 2015, and the decreasing share of hydropower from 14.8 percent in 2005 to 10.5 percent in 2015. Taken together, fossil fuels (coal, natural gas and oil)

made up of 67.6 percent of the country’s power sources in 2005 and increased to 74.5 percent in 2015, primarily because of increasing coal use. At this juncture, it is evident that the introduction of solar and wind power in the national power mix did not immediately translate to low-carbon energy transition. However, their increased uses serve as a critical pre-condition for a low-carbon transition to take place.

In comparison, the changes in Indonesia’s primary energy supply from 2005 to 2022 can be observed in Figure 1.5.

**Figure 1.5: Indonesia’s Primary Energy Supply by Sources (2005 to 2022)**



Sources: MEMR (Ministry of Energy and Mineral Resources Republic of Indonesia). (2007). *Handbook of Energy and Economic Statistics of Indonesia 2007*. Retrieved from <https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-economic-statistics-of-indonesia-2007-846h2h1.pdf> (for 2005 data); MEMR. (2018). *Handbook of Energy and Economic Statistics of Indonesia (Final Edition) 2018*. Retrieved from <https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-and-economic-statistics-of-indonesia-2018-final-edition.pdf> (for 2015 and 2018 data); MEMR. (2024). *Handbook of Energy & Economic Statistics of Indonesia 2023*. Retrieved from <https://esdm.go.id/assets/media/content/content-handbook-of-energy-and-economic-statistics-of-indonesia-2023.pdf> (for 2022 data)

Figure 1.5 shows that coal share increased from 15 percent in 2005 to 26 percent in 2015 to 40.9 percent in 2022 whereas bioenergy share dropped from 23 percent in 2005 to 7.2 percent in 2022. In aggregate, the use of fossil fuels increased from 73 percent in 2005 to about 90 percent in 2022, mainly because of more than doubling in coal use and a reduction in bioenergy use. Solar and wind power only began to take very small shares (only about 0.1 percent) in 2022, which again demonstrates Indonesia’s slower progress compared to the Philippines.

## 1.5.2. Conceptual Framework

This study employs historical institutionalism. Historical institutionalism positions institutions as the main unit of analysis by establishing that they act “as the principal factor structuring collective behaviour and generating distinctive outcomes.”<sup>44</sup> Historical institutionalism is characterised by attention to time,<sup>45</sup> which thus enables a longitudinal assessment of the different contexts that this study intends to do.

Historical institutionalism concepts of critical juncture, path dependence, and incremental change are particularly useful to trace the changes and consistencies along energy sector’s trajectory. Collier and Collier defined critical juncture as “a period of significant change, which typically occurs in distinct ways in different countries (or in other units of analysis) and which is hypothesised to produce distinct legacies.”<sup>46</sup> Critical junctures do not necessarily refer to singular ‘shocking’ events although such events can act as a trigger for critical junctures.<sup>47</sup> More broadly, critical junctures refer to a period of significant changes that have lasting impacts in a country.<sup>48</sup> A legacy, or a path dependent, is the “outcomes [of]... a crucial transition [that] establishes distinct trajectories.”<sup>49</sup>

Importantly, the application of historical institutionalism complements the engagement of the sociotechnical transition approach that is widely used to explain contemporary energy transition. Sociotechnical transition literature traditionally posits that energy transition begins with

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<sup>44</sup> Hall and Taylor. *Political Science and Three New Institutionalisms*, p. 937.

<sup>45</sup> Orren, K., and Skowronek S. (2018). Beyond the Iconography of Order: Notes for a “New” Institutionalism. In L. C. Dodd and C. Jillson. (eds.) *The Dynamics of American Politics: Approaches & Interpretations*. New York/Oxon: Routledge, pp. 311 – 330.

<sup>46</sup> Collier, R. B., and Collier, D. (2002). *Shaping the Political Arena: Critical Junctures, the Labor Movement, and Regime Dynamics in Latin America*. Notre Dame: University of Notre Dame Press, p. 29.

<sup>47</sup> Lipset, S. M., and Rokkan, S. (1967). Cleavage Structures, Party Systems, and Voter Alignments: An Introduction. In S. M. Lipset and S. Rokkan. (eds.) *Party Systems and Voter Alignments: Cross-National Perspectives*. New York: Free Press, pp. 1 – 64.

<sup>48</sup> Rokkan, S. (1970). *Citizens, Elections, and Parties*. New York: David McKay.

<sup>49</sup> Collier and Collier. *Shaping the Political Arena*, p. 28.

technological innovation. This dissertation argues that the emphasis on technological innovation as the key enabler is more applicable in countries with strong technological R&D capacity and capability, which most developing countries are lacking. In this regard, historical institutionalism complements sociotechnical transition and offers a more suitable approach to explain energy transition in developing countries by enabling an assessment of changes that happen within the energy sector's trajectory.

Comparative historical analysis is a methodology widely used in historical institutionalism studies. Having selected the Philippines and Indonesia as cases studies, this study categorises four periods along similar political developments in the country within which a systematic analysis using historical institutionalism concepts is applied to examine the causal relations between identified independent and dependent variables, and to what extent they have changed over time. The four identified periods are the post-independence era, the authoritarian era, the post-authoritarian era, and the renewable energy development era. To enable a thorough analysis, considering historical institutionalism's emphasis on historical processes, this study begins by examining the early landscape of the energy sector in both countries as a baseline. Having examined the four periods, the study then evaluates the progress of low-carbon energy transition in both countries.

### 1.5.3. Data Collection Methods

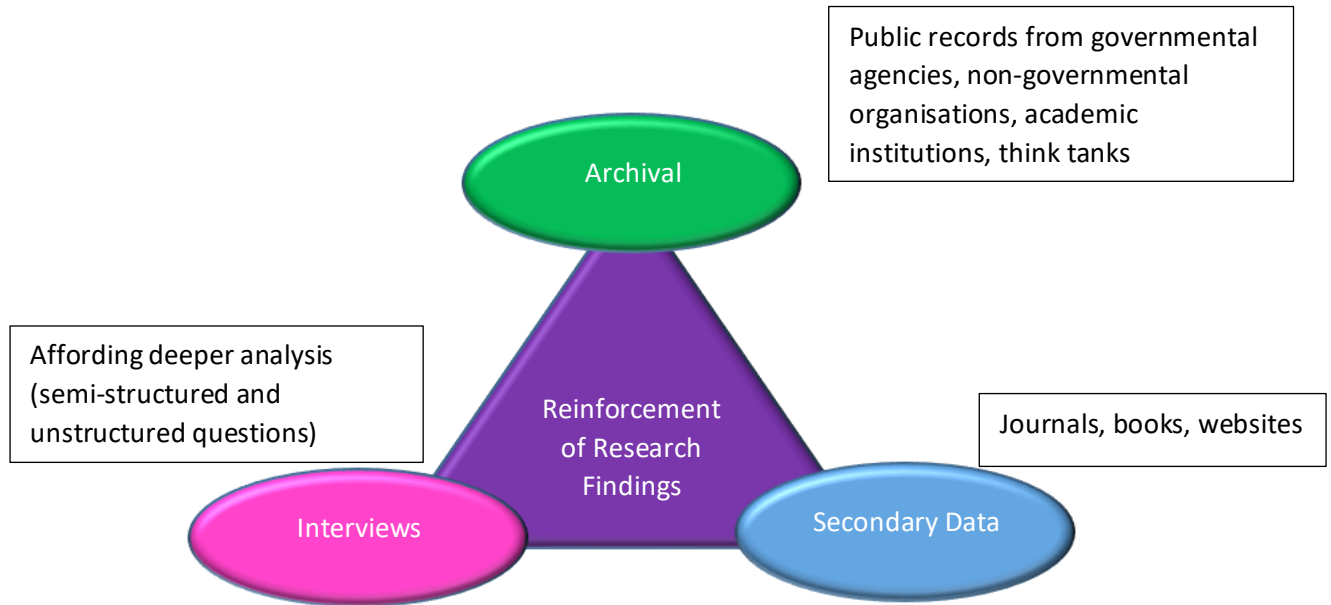
Given the importance of empirical data, this research employs triangulation method comprising of secondary data, interviews, and archival work (See Figure 1.6). Data triangulation, or the combining of three data collection methods, minimises bias and exercises objectivity.<sup>50</sup> Observer

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<sup>50</sup> Jick, T. D. (1979). Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Administrative Science Quarterly*, 24, 602 – 611.

bias was minimised as the author was not associated with any of the organisations that were part of the study, and she was the only one conducting interviews.

**Figure 1.6: Triangulation Research Methodology Model**



*Source: Author*

**Archival.** Data collection from archival work was sourced from documents publicly accessible in libraries and on the websites of governmental agencies, non-governmental organisations, academic institutions, and think tanks. Some government documents were transmitted via email after a request was made, and some other documents were given to the author during fieldwork. Non-governmental reports, including publications by the United Nations, the World Bank, the Asian Development Bank, the Greenpeace, and the World Wide Fund for Nature were used. Statistics were sourced from the websites of credible non-governmental organisations such as the World Resources Institute and the World Bank as well as the websites and published documents of government agencies such as the Indonesian Central Bureau of Statistics (Badan Pusat Statistik/BPS), the Indonesian Ministry of Energy and Mineral Resources, and the Philippine Department of Energy.

**Secondary Data.** A thorough literature search of books, journals, specialist publications, quality magazines and newspapers, and verified web-based materials were undertaken. Numerous relevant sources on the Philippines and on Indonesia are available at various libraries at the Nanyang Technological University in Singapore (these include the Business Library, the Humanities & Social Sciences Library, the S. Rajaratnam School of International Studies Library, the National Institute of Education Library, and the Lee Wee Nam Library) and the ISEAS–Yusof Ishak Institute Library in Singapore. During her visit to Jakarta in Indonesia, the author also went to the library of the Ministry of Energy and Mineral Resources to avail herself of some offline materials relating to the history of energy and electricity in the country. The author is bilingual in Indonesian and English. This has helped in the interrogation of materials about Indonesia given that many documents are written in Indonesian. In the Philippines, English-written materials are more commonplace, thus the author was able to peruse them thoroughly to obtain data.

**Interview.** The fieldwork period of this study fell within the time when the Covid-19 pandemic shut international borders around the world. The first round of interviews in 2021 was thus conducted online, primarily on the Zoom platform. Physical fieldworks to the Philippines and Indonesia were subsequently conducted in early 2023 after international travels became possible again. The interviews were carried out in structured and non-structured manners to allow open-ended conversations that facilitated respondents to feel at ease while explaining their views and developing them in greater details. Sampling technique employed was a combination of snowball and quota. The sampling frame contained the population of government officials and parliamentarians familiar with the energy sector, civil society organisations concerned about climate change and energy use, journalists covering the development of the energy sector, the private sector working in the energy industry, and academia or researchers specialising on energy. Individuals were first contacted via emails that consisted of self-introduction, study information, and a request for interview. Upon receiving positive responses, follow-up emails were sent to

arrange the date and time for the interviews. Ethical practices as stipulated in the Nanyang Technological University (NTU) Institutional Review Board (IRB) guidelines were followed through in this study. The NTU IRB has given approval for the author to conduct interviews as recorded in the NTU-IRB Reference: IRB-2020-11-018.

Consent from the research participant was sought prior to the interview. For online interviews, verbal consents were obtained in the event signed consent forms were not returned electronically by interview participants. Additionally, interview participants were briefed about the confidentiality of the interview and their right to refuse to answer certain questions and withdraw from the study should their participation in the study present them harm in any way. Research participants whose names are mentioned in this dissertation have given either their written or verbal consents to be on the record with information and data being attributed to them publicly.

The list of research participants can be found in Appendix A. Interview documents were stored in a safe place according to guidelines of the IRB. The author and the primary supervisor are the only persons having access to and using the documents.

## 1.6. Relevance and Contribution

The contributions of this study are as follows. First, it provides an independent qualitative assessment of low-carbon energy transition in the Philippines and Indonesia, focusing on the comparative evaluation of historical institutional development of the energy sector in both countries. It fills the gap in energy transition studies whose dominant socio-technical transition's Multi-Level Perspective (MLP) framework and its traditional emphasis on technological innovation as the primary driver of change is arguably more suitable to explain energy transition process in developed countries given their stronger technological R&D capacity and capability. Considering that developing countries like the Philippines and Indonesia do not have comparable

innovation capabilities as developed countries, there needs to be an alternative explanation to better illustrate energy transition processes in developing countries. In this regard, the application of historical institutionalism within socio-technical transition framework to examine low-carbon energy transition in the Philippines and Indonesia makes both theoretical and empirical contributions to sociotechnical transition literature.

In addition, this study's application of historical institutionalism to examine energy transition makes empirical contribution to the historical institutionalism literature which is commonly applied to examine characteristically large-scale political phenomena such as revolutions, welfare and political regimes, state formation and restructuring, among others. Furthermore, while historical institutionalism has been applied to evaluate energy transitions in developed countries, it has yet to be applied in the context of developing countries. This study's application of historical institutionalism to examine energy transition in the Philippines and Indonesia thus makes an empirical contribution to energy transition studies.

Second, this study complements existing empirical studies on renewable energy development in developing countries, including the Philippines and Indonesia, that tend to focus on examining the challenges in expanding renewable energy sources in individual countries. The author found this conventional observation contradictory to her initial statistical finding which showed that the Philippines was making relatively fast progress in expanding wind and solar capacities compared to Indonesia. This study thus argues that existing literature's heavy focus on the resistance to change from fossil fuels to renewable energy is inadequate to capture the complexity of energy transition processes taking place in both countries. Based on this consideration, this study employs historical institutionalism concepts to complement existing empirical studies on the Philippines and Indonesia by examining the historical processes in the energy sector and their effects on current low-carbon energy transition progress in both countries.

Third, the method and findings in this comparative study can potentially be applied to examine low-carbon energy transition in other developing countries in Southeast Asia and in other regions such as Latin America and Africa. Further detailed research will be required to assess its generalisability.

## 1.7. Study Limitation

Some limitations were observed throughout the course of the study. First is the limited availability of written materials on the historical accounts of the energy sector in both countries, especially in the colonial era and the early independence period. In some instances, only one or two written sources were found. Similarly, statistical data until late 1980s is limited. The limited sources can pose a challenge to finding more specific details on certain observations. Similarly, there was limited access to personal and high-level discussions among individuals or groups involved in past decision-making processes. Tracking these conversations closely is not possible given that many of the events happened way back in history, and the individuals concerned might have passed on without leaving any written accounts. Furthermore, despite being very well-versed of the contemporary development, many of the interview participants in both countries do not have the institutional memory to give a fuller account of historical events.

To address this limitation, the author consulted archival records extensively, including those that are insightful in sketching a broader and deeper understanding of the political, economic, societal, and power generation technology landscapes of the time, and relied on triangulation method to interpret and reconstruct the historical contexts as accurate as possible.

Second, this study does not delve into the technicalities of energy market, energy pricing, energy investment, and other related energy economic concepts.<sup>51</sup> The contribution of economic analyses could have further substantiated some observations made in this study, particularly the ones relating to coal and renewable energy costs.

## 1.8. Structure and Organisation of Dissertation

Following the introductory chapter, Chapter Two undertakes a critical review of the socio-technical transition literature that is pre-dominantly used in energy transition studies. It subsequently demonstrates a review of historical institutionalism and its main concepts and methodology, and makes a case for the application of historical institutionalism within the socio-technical transition framework to guide this study. Chapters Three and Four detail the empirical contexts of the Philippines and Indonesia respectively, beginning from the early period of the establishment of the energy sector in both countries, and analyse the interactions between the independent variables and the dependent variable within each of the four identified periods, and their influence in shaping contemporary low-carbon energy transition. Chapter Five provides a comparative evaluation between the two countries. Chapter Six offers conclusions and suggestions for future research based on the analytical findings in Chapters Three, Four and Five.

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<sup>51</sup> Yusgiantoro, P., and Yusgiantoro, L. (2018). *Ekonomi Energi: Teori dan Aplikasi*. Jakarta: Yayasan Purnomo Yusgiantoro.

## Chapter 2

### Literature Review of Energy Transition

#### 2.1. Introduction

The purpose of this chapter is to provide a critical review of the literatures that analyse the key approaches and concepts used to explain energy transition. It begins by setting the context for contemporary low-carbon energy transition by looking into the history of energy transition, climate change debates, and energy security discussions.

An examination into the history of energy transition is important given that the present-day low-carbon energy transition is neither the first nor the only transition that has ever happened in human history. The historical understanding of energy transition sheds light into the drivers and barriers in past energy transitions. Such knowledge is insightful to enable a comparison against the factors that drive the contemporary low-carbon energy transition agenda.

In addition, given the climate change context that underpins low-carbon energy transition, some level of familiarity of the different climate change narratives, and how they may, or may not, help in pushing for a successful low-carbon energy transition, is also important. A discussion on energy security is likewise necessary given the impact that the low-carbon energy transition agenda has on the energy sector. Knowing how energy security interacts with climate change issues is thus important to understand how low-carbon energy transition may, or may not, fit into energy security perspective.

The main sets of literature that this study use are the sociotechnical transition and historical institutionalism. Sociotechnical transition is the dominant approach that is widely applied to explain energy transition. Formulated most famously by Rip and Kemp, sociotechnical transition positions technological innovation as the key disruptive force that initiates energy transition. To contextualise, this chapter presents the experience of several countries that had developed wind

and solar technologies. While the importance of technological innovation is well established, a key debate in the literature is to what extent politics is playing a role. The debate shifted the focus of inquiry from technological innovation to domestic institutions, more particularly the State. This chapter presents some existing work that unpacks the role of the State in supporting the development of renewable energy technologies.

In view of the realities in developing countries where technological innovation capability is generally lacking, the focus on domestic institutions, especially the State, offers an alternative explanation that better fits the context in developing countries. This chapter thus explores more deeply how existing scholarly work have applied sociotechnical transition to examine changes that originated from the State instead of from technological innovation.

Subsequently, having identified the gap in the existing studies on energy transitions, the last part of this chapter evaluates historical institutionalism and elaborates the relevance of its concepts in filling the gap.

## 2.2. Setting the Context

Energy transition does not have a single definition.<sup>52</sup> In the literature, there is a variety of interpretations and emphases that shape the definitions of energy transition. The term may refer to a change in the use of specific fuels and their relevant technologies,<sup>53</sup> a switch from dependence on certain energy sources to dependence on other sources,<sup>54</sup> a systemic transformation affecting wider stakeholders and institutions involved in the energy sector,<sup>55</sup> that may include a

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<sup>52</sup> Sovacool, B.K. (2016). How Long Will It Take? Conceptualizing The Temporal Dynamics of Energy Transitions. *Energy Research & Social Science*, 13, 202–215.

<sup>53</sup> Hirsh, R.F. and Jones, C.F. (2014). History's Contributions to Energy Research and Policy. *Energy Research & Social Science*, 1, 106–111.

<sup>54</sup> Fouquet, R. and Pearson, P.J.G. (2012). Past and Prospective Energy Transitions: Insights from History. *Energy Policy*, 50, 1 – 7.

<sup>55</sup> Araújo, K. (2014). The Emerging Field of Energy Transitions: Progress, Challenges, and Opportunities. *Energy Research & Social Science*, 1, 112–121.

transformation of behaviours and practices relating to energy use.<sup>56</sup> Others qualify energy transition based on the scale of share that new energy sources can claim in an existing energy system within certain timeframe.<sup>57</sup>

In view of the global climate agenda, energy transition broadly means a shift from fossil fuel to renewable energy systems.<sup>58</sup> To be more specific, this dissertation defines low-carbon energy transition as the development and use of renewable energy sources to replace the dominance of fossil fuels in an energy system. This definition entails two components, namely the expansion of renewable energy technologies, and the phasing out of fossil fuels, which ideally take place simultaneously. It is acknowledged, however, that renewable energy development may precede fossil fuel phase out and thus serves as a precursor to low-carbon energy transition.

Energy transition is not a new phenomenon. In the past ten thousand years, energy transition has occurred in three different eras, namely the human labour period, the water- and wind-driven machine period, and the engine and turbine period.<sup>59</sup> In pre-industrial societies, energy primarily came from organic sources like wood, crop residues, and animal power.<sup>60</sup> The transition from an organic energy economy to one based on fossil fuels marked a significant turning point in human history. Driven by economic incentives and influenced by high wages and cheap energy, England was the first country to adopt coal-based technologies and transition to coal.<sup>61</sup> The transition that began in the early 1700s took nearly two centuries to complete. It was driven by the Industrial

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<sup>56</sup> Miller, C.A., Iles, A. and Jones, C.F. (2013). The Social Dimensions of Energy Transitions, *Science as Culture*, (22)(2), 135 – 148.

<sup>57</sup> See: Smil, V. (2010a). *Energy Myths and Realities: Bringing Science to the Energy Policy Debate*. Washington, DC: American Enterprise Institute.

<sup>58</sup> Lizette De La Peña, L. Guo, R. Cao, X., Ni, X., and Zhang, W. (2022). Accelerating the Energy Transition to Achieve Carbon Neutrality. *Resources, Conservation and Recycling*, 177, 105957.

<sup>59</sup> Smil, V. (2017). *Energy and Civilization: A History*. Cambridge, Massachusetts; London, England: The MIT Press.

<sup>60</sup> Fouquet, R. (2009). A Brief History of Energy. In J. Evans and L.C. Hunt. (eds.) *International Handbook on the Economics of Energy*. Cheltenham, UK; Massachusetts, USA: Edward Elgar Publishing, pp. 1 – 19.

<sup>61</sup> Allen, R. C. (2012). Backward into the Future: The Shift to Coal and Implications for the Next Energy Transition. *Energy Policy*, 50, 17 – 23.

Revolution that replaced wood with coal as the primary energy source, and was catalysed by the invention of steam engine that played a pivotal role in revolutionising energy use.<sup>62</sup> By the eighteenth century, coal had become a major energy source.<sup>63</sup>

The two-century timeframe indicates that energy transition process took a long time. Smil recorded that it took about 60 years for coal to have 50 percent share in the global market since it was introduced to replace wood in the mid-1800s, 60 years for oil to reach around 50 per cent share from the time it was introduced to replace coal in the early 1900s, and 55 years for natural gas to reach 25 percent share.<sup>64</sup>

Figure 2.1. shows the remarkable changes in the uses of coal, crude oil, natural gas, biofuels and nuclear since the world entered the fossil fuel era in the mid-1800s. The transition from biofuels to coal in the late 1800s was very stark and significant, and so was the overtaking of oil and its eventual dominance from the 1960s until year 2010.

While economic incentives and technological innovation played a critical role in driving energy transition, energy security concerns were likewise an important consideration. Energy security pertains primarily to the availability of sufficient energy supply at affordable prices.<sup>65</sup> When it comes to the trade of energy sources, political and geopolitical risks come into the picture, thereby framing the availability of energy supply at affordable prices a national security concern.<sup>66</sup> This was seen during the 1970s global oil crisis,<sup>67</sup> which rendered oil imports problematic for many

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<sup>62</sup> Solomon, B. D. and Krishna, K. (2011). The Coming Sustainable Energy Transition: History, Strategies, and Outlook. *Energy Policy*, 39, 7422 – 7431.

<sup>63</sup> Fouquet. *A Brief History of Energy*.

<sup>64</sup> Smil, V. (2010b). *Energy Transitions: History, Requirements, Prospects*. Santa Barbara, CA: Praeger.

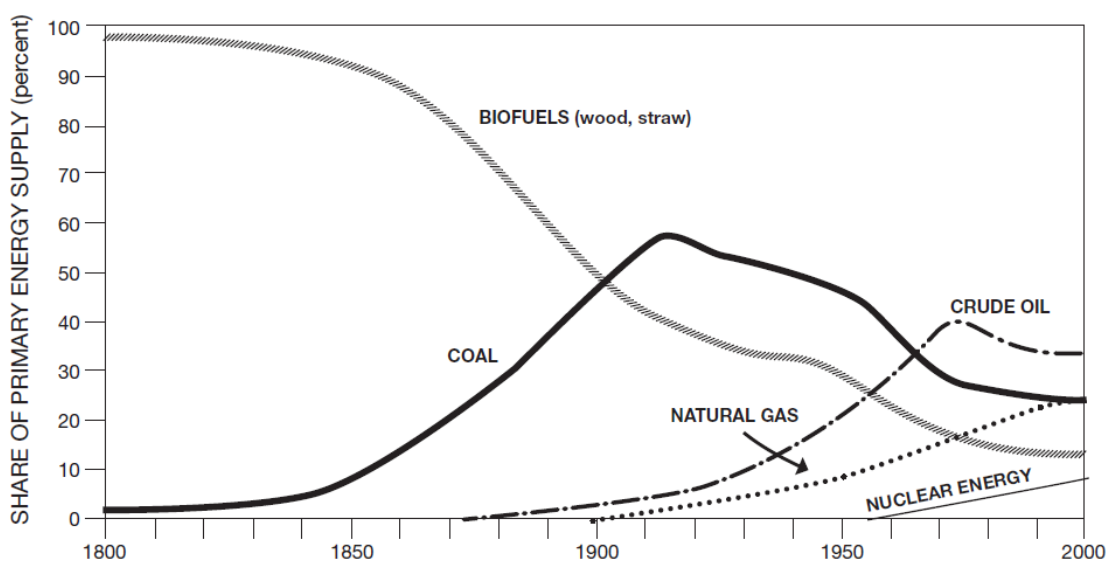
<sup>65</sup> See: Deese, D. A. (1979). Energy: Economics, Politics, and Security. *International Security*, (4)(3), 140 – 154; and Yergin, D. (1988). Energy Security in the 1990s. *Foreign Affairs*, (67)(1), 110 – 132.

<sup>66</sup> See: Denny, L. (1928). *We Fight for Oil*. New York; London: Alfred A. Knopf Inc, and Brunner, C. T. (1930). *The Problem of Oil*. London: E. Benn Ltd.

<sup>67</sup> Hughes, L., and Lipsey, P. Y. (2013). The Politics of Energy. *Annual Review of Political Science*, 16, 449 – 469.

countries<sup>68</sup> and compelled them to reconsider their energy policies. Driven by State initiatives, France shifted from oil-fired electric power to nuclear power, and Brazil transitioned from an oil-based transportation system to one based on sugarcane-ethanol.<sup>69</sup>

**Figure 2.1: The Changing Uses of Various Energy Sources (1800 to 2000)**



Source: Plotted in Smil (2017) from data found in Smil (2010b) and United Nations Organization. (1956). *World Energy Requirements in 1975 and 2000*. Proceedings of the International Conference on the Peaceful Uses of Atomic Energy (1), 3 – 33. New York: UNO.

The emphasis on energy availability and affordability has subsequently expanded. Scholars reworked and proposed various other dimensions of energy security, such as accessibility and acceptability,<sup>70</sup> energy and economic efficiency, and environmental stewardship,<sup>71</sup> and technology development, sustainability and regulation.<sup>72</sup> The various elements that constitute energy

<sup>68</sup> Lubell, H. (1961). Security of Supply and Energy Policy in Western Europe. *World Politics*, (13)(3), 400 – 422.

<sup>69</sup> Solomon and Krishna. *The Coming Sustainable Energy Transition*.

<sup>70</sup> APERC (Asia Pacific Energy Research Centre). (2007). *A Quest for Energy Security in the 21<sup>st</sup> Century: Resources and Constraints*. The Institute of Energy Economics, Japan.

<sup>71</sup> Sovacool, B., and Brown, M. (2010). Competing Dimensions of Energy Security: An International Review. *Annual Review of Environment and Resources*, 35, 77 – 108.

<sup>72</sup> Sovacool, B., and Mukherjee, I. (2011). Conceptualizing and Measuring Energy Security: A Synthesized Approach. *Energy*, 36, 5343 – 5355.

security<sup>73</sup> allow countries to construct their own energy security definitions, based on their interpretations and priorities.

Consequently, given the subjective nature of energy security definitions, the transition to low-carbon energy sources fits into countries' energy security priorities differently. This is because the contemporary push for low-carbon energy transition was first and foremost grounded in climate concerns. The historic 1992 UNFCCC categorises climate responses into two broad themes namely climate mitigation and climate adaptation. The former aims at reducing GHG emissions whereas the latter endeavours to strengthen the capacity to respond to climate impacts. Mitigation and adaptation interventions are generally sectoral. In high-emitting sectors like energy and transportation, the priorities are on climate mitigation. In climate-vulnerable sectors like agriculture and fishery, the emphasis is on climate adaptation. Low-carbon energy transition is a key strategy to reduce GHG emissions.

Considering their needs to develop their economies, developing countries did not initially bear the same responsibilities as the developed countries to reduce their GHG emissions. In fact, developing countries were positioned as the beneficiaries of assistance from developed countries to participate in the global climate mitigation initiatives. This was evidenced in the 1997 Kyoto Protocol which was convened to get industrialised countries and economies-in-transition commit to limit and reduce their GHG emissions,<sup>74</sup> and resulted in the formulation of several market-based mechanisms, namely the International Emissions Trading (IET), the Clean Development Mechanism (CDM), and Joint Implementation (JI). The CDM is particularly designed to enable the development of renewable energy installations in developing countries by allowing developed

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<sup>73</sup> Kruyt, B., van Vuuren, D.P., de Vries, H.J., and Groenenberg, H. (2009, June). Indicators for Energy Security. *Energy Policy*, 37(6), 2166 – 2181.

<sup>74</sup> United Nations Climate Change. (n.d.a.). *What is the Kyoto Protocol?* Retrieved from: [https://unfccc.int/kyoto\\_protocol](https://unfccc.int/kyoto_protocol)

countries to offset their emissions through emission reduction or emission removal projects in the developing countries.<sup>75</sup>

The initial emphasis on developed countries as the main bearers of climate mitigation agenda experienced a new turn at the COP21 in 2015 in Paris. It was a watershed in the global climate processes considering that, unlike before, developing countries stepped forward for the first time to pledge their intention and commitment to reduce their own emissions. Dubbed the Nationally Determined Contribution (NDC),<sup>76</sup> all developed and developing country Parties of the UNFCCC expressed their readiness to assume responsibility to cut down emissions. This signifies that developing countries were intent to transform their energy systems to low-carbon alternatives.

In addition to the UNFCCC, various international organisations, most notably the United Nations agencies such as the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP), among others, have likewise been promoting low-carbon energy transition aggressively. The promotion of renewable energy sources at the global level was further strengthened by the establishment of the International Renewable Energy Agency (IRENA), an intergovernmental body comprising of 180 countries, in 2009.<sup>77</sup> IRENA is specifically mandated to support governments in their low-carbon transition efforts.

While numerous initiatives have been formulated to encourage renewable energy development since the signing of the landmark 1992 UNFCCC, Figure 1.1 shows that the rise of GHG emissions in the energy sector continues unabated over the years. This signifies the presence of challenges in the implementation of the low-carbon energy transition agenda.

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<sup>75</sup> UNFCCC. (2010). *The Kyoto Protocol Mechanisms*. Bonn: UNFCCC. Retrieved from [https://cdm.unfccc.int/about/cdm\\_kpm.pdf](https://cdm.unfccc.int/about/cdm_kpm.pdf)

<sup>76</sup> UN. (2015). *Paris Agreement*. Retrieved from [https://unfccc.int/sites/default/files/english\\_paris\\_agreement.pdf](https://unfccc.int/sites/default/files/english_paris_agreement.pdf)

<sup>77</sup> IRENA. (n.d.). *About IRENA*. Retrieved from <https://www.irena.org/aboutirena>

Unlike past energy transition, the contemporary low-carbon energy transition is driven primarily by climate concerns instead of by inventions that reduce costs or deliver better performances in the energy sector. Compared to fossil fuels, the solar and wind technologies at the time of this dissertation writing are not yet capable of generating as much electricity capacity given several constraints such as land availability. Furthermore, their intermittent characters necessitate the use of other technologies such as pumped storage hydropower and battery storage systems which are still expensive at present. In other words, seen from performance perspective, the use of renewable energy sources to replace fossil fuels is not intuitive. The case for their increased use is primarily founded on stronger climate change narrative and decreasing costs in recent years. From energy generation perspective, this does not present a compelling case for a fossil fuel switch.

Furthermore, there is a wide range of perceptions about climate change. The near-universal membership of the 1992 UNFCCC may signal a global agreement on the basic tenet of climate change, but countries, societies, and individuals internalise the issue from varied lenses. The spectrum goes from climate alarmists on one end to climate deniers on the other end, which represent a spectrum of beliefs, priorities, strategies, types of solutions offered, and the degrees of reinforcements expected.<sup>78</sup> The presence of diverse and often conflicting climate change narratives fragments public opinion and political will, and makes it difficult for countries to achieve a strong, united collective will necessary for low-carbon energy transition.

Consequently, although it is now already regarded as the most critical solution to mitigate climate change, the perception and approach to low-carbon energy transition differs across societies. Some see the need to do away with fossil fuels completely, while some others favour doing away with the emissions while retaining some use of fossil fuels. Likewise, some argue more strongly for environmental causes and call for the societies to make the needful sacrifices, while some

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<sup>78</sup> See for example: Bushell, et al. *Strategic Narrative in Climate Change*.

others prioritise human needs and argue that renewable energy is not yet capable of meeting human needs.

The different emphases and reasonings, which are often complicated by the attribution of responsibility between the North and the South, and related anguish over climate justice and climate financing, places low-carbon energy transition on a rocky foundation. Although the declining costs of solar and wind technologies in recent years has given renewable energy expansion a stronger economic justification, the case for global low-carbon energy transition was built on a contentious ground.

The contentious context within which low-carbon energy transition is taking place, and learning from energy transitions throughout history, positions the State as the most prominent actor in energy transition. Strong State intervention and support is imperative for successful energy transitions, including in encouraging the adoption and diffusion of technological innovation necessary to enable low-carbon energy transition.<sup>79</sup> Reflecting on historical observations, it will also be likely that the contemporary low-carbon energy transition will take a very long time despite rapid progress in the introduction of solar and wind power in recent years.<sup>80</sup>

### 2.3. Sociotechnical Transition

Sociotechnical transition is the most dominant paradigm that is used to explain the mechanisms behind energy transition processes.<sup>81</sup> Sociotechnical approach highlights the two-way interaction

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<sup>79</sup> Solomon and Krishna. *The Coming Sustainable Energy Transition: History, Strategies, and Outlook*.

<sup>80</sup> Smil. *Energy and Civilization*.

<sup>81</sup> See: Rip and Kemp. *Technological Change*; Meadowcroft, J. (2005). Environmental Political Economy, Technological Transitions and the State. *New Political Economy*, (10)(4), 479 – 498; Meadowcroft, J. (2011). Engaging with the Politics of Sustainability Transitions. *Environmental Innovation and Societal Transitions*, (1)(1), 70 – 75; Geels, F.W. and Schot, J. (2007). Typology of Sociotechnical Transition Pathways. *Research Policy*, (36)(3), 399 – 417; and Scrase, I. and Smith, A. (2009). The Non-Politics of Managing Low Carbon Socio-Technical Transitions. *Environmental Politics*, (18)(5), 707 – 726.

between technology and the social environment by establishing that technological advancement is shaped by social, economic and political forces; and vice versa, technology and technological systems influence human relations and society.<sup>82</sup> Sociotechnical transition refers to deep structural changes that involve long-term and complex transformations of not only technology, but also policy, infrastructure, scientific knowledge, as well as social and cultural practices.<sup>83</sup>

Sociotechnical transition approach is rooted in technological change literature. It assesses how new technologies emerge and how they replace or merge with existing technologies, by taking into consideration the environments within which such technologies function. Within the sociotechnical transition literature, the Multi-Level Perspective (MLP) is the framework used to assess technological transition. It comprises three levels of heuristic, analytical concepts namely: niche-innovations, sociotechnical regimes and sociotechnical landscape.<sup>84</sup>

*Niche-innovations* is the level where radical inventions are created. This is where new products are yet to enter the market but are given the space to be developed. In other words, niche-innovations level functions like an R&D laboratory.

*Sociotechnical regime* or *regime* refers to the current technology and its surrounding system, which comprises among others, its production processes, the skills and procedures needed to operate the technology, the characteristics of the product, the ways to troubleshoot technical problems, and the engineering practices in-use.<sup>85</sup> Sociotechnical regime is a concept that has its origins in Nelson and Winter's definition of technological regime, which refers to engineering community and its shared cognitive routines and patterns along certain technological

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<sup>82</sup> Rip and Kemp. *Technological Change*.

<sup>83</sup> Geels, F.W. (2011). The Multi-Level Perspective on Sustainability Transitions: Responses to Seven Criticisms. *Environmental Innovation and Societal Transitions*, (1)(1), 24 – 40.

<sup>84</sup> Rip and Kemp. *Technological Change*.

<sup>85</sup> Rip, A. (1995). Introduction of New Technology: Making Use of Recent Insights from Sociology and Economics of Technology. *Technology Analysis and Strategic Management*, 7, 417 – 431.

trajectories.<sup>86</sup> Further development in the scholarship argues that it is not only the engineering community that shapes technological trajectory, but also the broader society including scientists, policymakers, users, and special interest groups.<sup>87</sup> The expansion of the concept thus becomes the foundation for what is now referred to as sociotechnical regime.

*Sociotechnical landscape* is the external environment within which sociotechnical regime and niche-innovations operate, which may not be directly related to them, but has influence on them. This includes macro-economic and political development, deep cultural patterns, international norms, among others.

The application of the MLP framework aims to explain the possible mechanisms of change that lead to a trajectory shift at the sociotechnical regime level. The MLP has been used to analyse both historical transitions<sup>88</sup> and contemporary and future sustainability transitions.<sup>89</sup> The general process of technological change that the MLP proposes is as follows.<sup>90</sup> Technological innovation

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<sup>86</sup> Nelson, R.R., and Winter, S.G. (1982). *An Evolutionary Theory of Economic Change*. Cambridge, MA: Belknap Press.

<sup>87</sup> Bijker, W. E. (1995). *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*. Cambridge, MA: MIT Press.

<sup>88</sup> See: Geels, F. W. (2002). Technological Transitions as Evolutionary Reconfiguration Processes: A Multi-Level Perspective and A Case-Study. *Research Policy*, (31)(8-9), 1257 – 1274; Geels, F. W. (2005). The Dynamics of Transitions in Socio-Technical Systems: A Multi-Level Analysis of the Transition Pathway from Horse-Drawn Carriages to Automobiles (1860–1930). *Technology Analysis & Strategic Management*, (17)(4), 445 – 476; Geels and Schot. *Typology of Sociotechnical Transition Pathways*; and Berkers, E., and Geels, F. W. (2011). System Innovation through Stepwise Reconfiguration: The Case of Technological Transitions in Dutch Greenhouse Horticulture (1930–1980). *Technology Analysis & Strategic Management*, (23)(3), 227 – 247.

<sup>89</sup> See: Nykvist, B., and Whitmarsh, L. (2008). A Multi-Level Analysis of Sustainable Mobility Transitions: Niche Development in the UK and Sweden. *Technological Forecasting and Social Change*, (75)(9), 1373 – 1387; van Bree, B., Verbong, G. P. J., and Kramer, G. J. (2010). A Multi-Level Perspective on The Introduction of Hydrogen and Battery-Electric Vehicles. *Technological Forecasting and Social Change*, (77)(4), 529 – 540; Morrissey, J. E., Miroso, M., and Abbott, M. (2014). Identifying Transition Capacity for Agri-Food Regimes: Application of the Multi-level Perspective for Strategic Mapping. *Journal of Environmental Policy & Planning*, (16)(2), 281 – 301; Hynes, M. (2016). Developing (Tele)work? A Multi-Level Sociotechnical Perspective of Telework in Ireland. *Research in Transportation Economics*, 57, 21 – 31; Osunmuyiwa, O., Biermann, F. and Kalfagianni, A. (2018). Applying the Multi-Level Perspective on Socio-Technical Transitions to Rentier States: The Case of Renewable Energy Transitions in Nigeria. *Journal of Environmental Policy & Planning*, (20)(2), 143 – 156; and Moradi, A., and Vagnoni, E. (2018). A Multi-Level Perspective Analysis of Urban Mobility System Dynamics: What Are The Future Transition Pathways? *Technological Forecasting and Social Change*, 126, 231 – 243.

<sup>90</sup> Geels and Schot. *Typology of Sociotechnical Transition Pathways*.

has its beginnings at the niche or micro-level of local practices, that comes about from within existing regime and sociotechnical landscape. Innovations reinforce their positions through learning processes, expanding social networks, support from influential groups, improvements in price and performance, among others. While innovations are emerging, regime sustains pressure from sociotechnical landscape. Changes from niche and landscape, which are pressed upon regime, create cracks on regime and make way for niche-originated innovations to penetrate regime and get diffused into it. Regime and landscape eventually get disrupted and transformed into a new trajectory, and users, including individuals, organisations, and societies, will implement and adapt to the new technology. The implementation results in lesser resistance and greater certainty about the new technology, leading to standardisation. The process of implementing, using, and domesticating a new technology consolidates its use within the society and makes it hard to get replaced.

#### 2.4. Gap in Sociotechnical Transition Literature

While the MLP provides a useful framework to examine energy transition, its emphasis on innovation as the primary driver of change is arguably less relevant in developing countries. This is because developing countries, with the exception of China, India, and other major emerging markets, do not have the same capacity for R&D as developed countries. Building domestic capacity for technological R&D requires much investment and expertise, which is already a challenge in industrialised countries, and even more so in developing countries, where, despite advancements in places like China and India, green innovations often still lag behind Western cutting-edge technologies.<sup>91</sup> As such, niche-level innovations in developing countries may not have comparable capability to challenge and change existing sociotechnical regime. In a similar

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<sup>91</sup> Cook, P. L. and Surrey, J. (1989). Energy Technology in Developing Countries: The Scope for Government Policy. *Technovation*, 9, 431 – 451.

vein, Baker et al.<sup>92</sup> and Swilling and Annecke<sup>93</sup> observed that the sociotechnical transition literature has generally been Eurocentric and does not yet capture well the processes in developing countries.

This observation does not imply that the MLP cannot be applied to examine energy transition in developing countries. Quite the contrary, the MLP acts as a processual framework that allows for the engagement of a variety of theories and approaches in search for more refined explanations of technological change. This is done by investigating the possible change mechanisms that happen at each level or between levels of the MLP framework.

A prominent example is drawn from a study by Geels who applied evolutionary economics and technology studies to the MLP framework to examine how new technology survives or dies, and how new technology makes its way to existing regime.<sup>94</sup> He observed that change process entails not only choosing particular technologies among many choices and then retaining them, but also encompassing disruption and rebuilding. Geels noted that the use of the MLP in examining transitions heavily focuses on innovations at the niche level as the starting point, but argued that it may not always be the case because there are dynamics happening at landscape and regime levels, such as regulation change, infrastructural change, and industrial networks change, that can initiate transitions too.

As such, while innovation is a key component in transition, regime can open with or without pressure from innovation, such as when it encounters problems and tensions from landscape, or faces an emergence of specialised actors. Changes at landscapes and regimes will then open opportunities for innovations at niche level to break out. In other words, change can begin either because of stimulation from niche-level innovation, or because regime and landscape experience

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<sup>92</sup> Baker, P., Newell, L., and Phillips, J. (2014). The Political Economy of Energy Transitions: The Case of South Africa. *New Political Economy*, (19)(6), 791 – 818.

<sup>93</sup> Swilling, M., and Annecke, E. (2012). *Just Transitions: Explorations of Sustainability in an Unfair World*. Tokyo; New York; Paris: UCT Press.

<sup>94</sup> Geels. *Technological Transitions as Evolutionary Reconfiguration Processes*.

changes and create an opening for niche-level invention to break in. Geel's study thus offered an alternative view to the original innovation-driven transition thinking.

Another example of enriching the MLP is in the analysis of the role of human agency in driving transition. The transition process proposed by the MLP generally assumes that technological changes can happen without agency and without deliberate decisions from actors. This was seen in the emphasis on technical-managerial dimension,<sup>95</sup> which includes matters such as collaborations among innovators.<sup>96</sup> Smith et al. found this problematic and pointed to the need to include agency in the analysis of technological transition.<sup>97</sup> In response to such criticism, Geels brought in agency or actors into the MLP analysis by applying micro-sociological theories.<sup>98</sup> According to this view, technological change involves interpretive processes on the part of actors.<sup>99</sup> Human decisions are governed by socio-cognitive dimensions, and this in turn affects selection processes and favours certain technology. The complexity of socio-cognitive dimensions is manifested in the contested and conflictual character of transition, which involves struggles among different actors such as between new and incumbent businesses, between new and old technologies, between narratives, between ideas, and between political agendas, goals and policies.<sup>100</sup> Goldthau and Sovacool observed that new innovations are likely to get implemented when they complement the dominant features of the incumbent system,<sup>101</sup> and this suggests that there are actors who make decisions about the implementation of the new technologies. Decision-

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<sup>95</sup> Newell, P., and Phillips, J. (2016). Neoliberal Energy Transitions in the South: Kenyan Experiences. *Geoforum*, 74, 39 – 48.

<sup>96</sup> Meadowcroft. *Engaging with the Politics of Sustainability Transitions*.

<sup>97</sup> Smith, A., Stirling A., and Berkhout, F. (2005). The Governance of Sustainable Socio-technical Transitions. *Research Policy*, 34, 1491 – 1510.

<sup>98</sup> Geels, F. W. (2020). Micro-Foundations of the Multi-level Perspective on Socio-Technical Transitions: Developing a Multi-Dimensional Model of Agency through Crossovers between Social Constructivism, Evolutionary Economics and Neo-institutional Theory. *Technological Forecasting & Social Change*, 152, 119894.

<sup>99</sup> Bijker. *Of Bicycles, Bakelites, and Bulbs*.

<sup>100</sup> Geels. *Micro-Foundations of the Multi-level Perspective on Socio-Technical Transitions*.

<sup>101</sup> Goldthau, A., and Sovacool, B.K. (2012, February), The Uniqueness of the Energy Security, Justice, and Governance Problem. *Energy Policy*, 41, 232 – 240.

making points to agency, and assessing the dynamics among actors is therefore an important aspect of the MLP analyses.

The importance of agency is further buttressed by observations within the broader literature that pointed to the need for the State to lay the foundations and incentivise market players to implement renewable energy.<sup>102</sup> In a similar vein, contrary to contemporary neoliberal economy principles that believe in market mechanisms, Rodrik affirmed that government initiatives are not only desirable, but imperative in energy transition.<sup>103</sup>

It is further argued that even niche-level innovation needs supporting policy for it to have a chance to succeed. Green technology innovations rely on environmental policy to create demand; without such regulation, the demand for clean technologies will be significantly lower, thereby delaying low-carbon energy transition.<sup>104</sup> Environmental regulations can thus stimulate innovations and enhance competitiveness.<sup>105</sup> The role of regulations to induce innovation in environmental technologies, which are essential to meet climate goals, is well documented in existing literature.

This observation is illustrated in the following examples. In India, the State's active involvement was visible in the establishment of renewable energy R&D centres like the Indian Renewable Energy Development Agency Limited (IREDA), the Centre for Wind Energy Technology (CWET), and the Jawaharlal Nehru National Solar Mission to support solar power expansion.<sup>106</sup> In 2014-2019, Prime Minister Narendra Modi's administration envisioned USD100 billion worth of foreign investments on renewable energy within a period of seven years, and had acquired USD1

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<sup>102</sup> See for example: Mazzucato, M. (2014). *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. London/New York: Anthem Press.

<sup>103</sup> Rodrik, D. (2014). Green Industrial Policy. *Oxford Review of Economic Policy*, (30)(3), 469 – 491.

<sup>104</sup> Rennings, K. (2000). Redefining Innovation—Eco-Innovation Research and the Contribution from Ecological Economics. *Ecological Economics*, (32)(2), 319 – 332; and Walz, R., and Köhler, J. (2014). Using Lead Market Factors to Assess the Potential for a Sustainability Transition. *Environmental Innovation and Societal Transitions* 10: 20 – 41.

<sup>105</sup> Porter, M. E., and van der Linde, C. (1995). Toward a New Conception of the Environment-Competitiveness Relationship. *Journal of Economic Perspectives*, (9)(4), 97 – 118.

<sup>106</sup> Sisodia, G. S., and Singh, P. (2016). *The Status of Renewable Energy Research on India*. *Energy Procedia*, 95, 416 – 423.

billion from the US Import-Export Bank.<sup>107</sup> In addition, to support the development of local capacity to produce its own wind turbines, India has implemented preferential customs and excise duties for wind turbine parts (in contrast to the whole set), and created a national certification program for wind turbines.<sup>108</sup>

In China, the State's direct involvement was observed in its funding for renewable energy technological innovation. China's renewable energy investment in 2007 was the second largest in the world after Germany, amounting to more than USD12 billion, and in its tenth five-year plan (2001 to 2005), the Chinese government allocated a significant portion of its national budget that amounted to about 129.00 million Yuan for key technology R&D, of which renewable energy projects were part of.<sup>109</sup>

The State's support for the renewable energy sector was also evidenced in Denmark. The Danish government disbursed about 30 million Euros of funding to a government committee established in 1982 that was tasked to develop renewable energy technologies.<sup>110</sup> The country has a long-standing tradition in wind power technology development that started in the mid-19<sup>th</sup> century. Denmark had the ability to produce its own wind turbine, and in 1978, a machine-testing programme was installed at Risø National Laboratory to ensure turbine quality and performance. The scientific and technical capabilities to produce a map of wind power potential across Denmark in the early 1980s further gave Denmark the confidence to pursue wind technology.

A similar situation was observed in Spain. Spain's law on energy conservation in 1980 allocated up to 30 percent investment support for renewable energy. In 2001, Spain spent about half of its

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<sup>107</sup> Parkes, R. (2016). India: Realising Its Potential. *Renewable Energy Focus*, (17)(1), 36 – 38.

<sup>108</sup> Lewis, J.I. (2007). Technology Acquisition and Innovation in the Developing World: Wind Turbine Development in China and India. *Studies in Comparative International Development*, (42)(3–4), 208–232.

<sup>109</sup> Huang, C., Su, J., Zhao, X., Sui, J., Ru, P., Zhang, H., and Wang, X. (2012). Government Funded Renewable Energy Innovation in China. *Energy Policy*, 51, 121–127.

<sup>110</sup> Meyer, N. I. (2007). Learning from Wind Energy Policy in the EU: Lessons from Denmark, Sweden and Spain. *European Environment*, 17, 347 – 362.

total R&D budget in the energy sector for renewable energy, and between 1996 and 2001, Spain was among the EU countries with major spending on solar photovoltaic R&D.<sup>111</sup> Government support was instrumental in nurturing the country's capacity for renewable energy technologies, thereby establishing Spain's reputation for its high technical expertise in wind turbine production, and enabling it to capture 16.4 percent of world's wind turbine market in 2002.<sup>112</sup> In 2004, Spanish company Gamesa Eólica recorded the second largest wind turbine sale in the world.<sup>113</sup>

The German government likewise supported the development of renewable energy technologies. Fund allocation for R&D has increased significantly from about 10 million Euros in 1974, to about 60 million Euros in 1978, and to 150 million Euros in 1982, with over 1 billion Euros being earmarked for federal energy research programme on all types of renewable energy from 1990 to 1998.<sup>114</sup> In response to the 1973 oil crisis, Germany embarked on Grosswindanlage project (wind technology R&D) that lasted from 1974 to 1987, after which research focused more on smaller wind turbine sizes and has resulted in successful outcomes.<sup>115</sup>

At this juncture, it is evident that the government played a critical role in facilitating the birth of new technologies through the provision of support for technological R&D. Sociotechnical transition's narrow focus on technological innovation<sup>116</sup> thus needs to consider State's role more

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<sup>111</sup> Ragwitz, M., and Apollonia, M. (2005). Evidence from RD&D Spending for Renewable Energy Sources in the EU. *Renewable Energy*, 30, 1635 – 1647.

<sup>112</sup> del Rio, P., and Unruh, G. (2007). Overcoming the Lock-Out of Renewable Energy Technologies in Spain: The cases of Wind and Solar Electricity. *Renewable and Sustainable Energy Reviews*, (11)(7), 1498 – 1513.

<sup>113</sup> Meyer. *Learning from Wind Energy Policy in the EU*.

<sup>114</sup> Lauber, V., and Mez, L. (2004). Three Decades of Renewable Electricity Policies in Germany. *Energy and Environment*, (15)(4), 599 – 623.

<sup>115</sup> Klaassen, G., Miketa, A., Larsen, K., and Sundqvist, T. (2005). The Impact of R&D on Innovation for Wind Energy in Denmark, Germany and the United Kingdom. *Ecological Economics*, (54)(2–3), 227 – 240.

<sup>116</sup> See: Goldthau and Sovacool. *The Uniqueness of the Energy Security, Justice, and Governance Problem*.

deeply. In this regard, politics has been identified as an important factor in energy transitions although it has not been applied widely in existing analyses.<sup>117</sup>

The search for more refined explanations of technological change using the MLP framework has expanded the scope of its analyses and generated multiple research sub-streams that cover, among others, the effects of politics and power on transition,<sup>118</sup> the role of cultural discourse and narratives on transition,<sup>119</sup> the impact of grassroots innovations on transition,<sup>120</sup> the response of incumbent enterprises towards transition,<sup>121</sup> the strategic role of policymaking in transition,<sup>122</sup> and the more methodologically-focused studies that examine and conceptualise various transition pathways.<sup>123</sup>

The investigations of these different aspects of transition are made possible by applying a variety of theories into the MLP framework. This is the reason why, despite its original emphasis on

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<sup>117</sup> See: Smith, A., and Stirling, A. (2007). Moving Outside or Inside? Objectification and Reflexivity in the Governance of Socio-Technical Systems. *Journal of Environmental Policy & Planning*, (9)(3-4), 351 – 373; Lehtonen, M., and Kern, F. (2009). Deliberative Socio-Technical Transitions. In I. Scrase and G. MacKerron. (eds.) *Energy for the Future: A New Agenda*. Basingstoke: Palgrave, pp. 103 – 121; Meadowcroft, J. (2009). What about the Politics? Sustainable Development, Transition Management, and Long Term Energy Transitions. *Policy Sciences*, (42)(4), 323 – 340; Meadowcroft. *Engaging with the Politics of Sustainability Transitions*.

<sup>118</sup> See: Geels, F. W. (2014). Regime Resistance against Low-Carbon Transitions: Introducing Politics and Power into the Multi-Level Perspective. *Theory, Culture & Society*, (31)(5), 21 – 40; Smink, M. M., Hekkert, M. P., and Negro, S. O. (2015). Keeping Sustainable Innovation on a Leash? Exploring Incumbents' Institutional Strategies. *Business Strategy and the Environment*, (24)(2), 86 – 100; Hess, D. J. (2016). The Politics of Niche-Regime Conflicts: Distributed Solar Energy in the United States. *Environmental Innovation and Societal Transitions*, 19, 42 – 50; and Markard, J., Suter, M., and Ingold, K. (2016). Socio-Technical Transitions and Policy Change Advocacy Coalitions in Swiss Energy Policy. *Environmental Innovation and Societal Transitions*, 18, 215 – 237.

<sup>119</sup> See: Hermwille, L. (2016). The Role of Narratives in Socio-Technical Transitions – Fukushima and the Energy Regimes of Japan, Germany, and the United Kingdom. *Energy Research & Social Science*, 11, 237 – 246; Rosenbloom, D., Berton, H., and Meadowcroft, J. (2016). Framing the Sun: A Discursive Approach to Understanding Multi-dimensional Interactions within Socio-Technical Transitions through the Case of Solar Electricity in Ontario, Canada. *Research Policy*, (45)(6), 1275 – 1290; Roberts., J. C. D. (2017). Discursive Destabilisation of Socio-Technical Regimes: Negative Storylines and the Decline of the American Railroads. *Energy Research & Social Science*, 31, 86 – 99; and Roberts, C., and Geels, F. W. (2018). Public Storylines in the British Transition from Rail to Road Transport (1896-2000): Discursive Struggles in the Multi-Level Perspective. *Science as Culture*, (27)(4), 513 – 542.

<sup>120</sup> Seyfang, G. and Smith, A. (2007). Grassroots Innovations for Sustainable Development: Towards a New Research and Policy Agenda. *Environmental Politics*, (16)(4), 583 – 603.

<sup>121</sup> Markard, et al. *Socio-technical Transitions and Policy Change*.

<sup>122</sup> Smith, et al. *The Governance of Sustainable Socio-technical Transitions*.

<sup>123</sup> See: Smith, et al. *The Governance of Sustainable Socio-technical Transitions*; Geels and Schot. *Typology of Sociotechnical Transition Pathways*.

niche-level innovations, which is arguably more applicable to developed countries, the MLP remains relevant to assess energy transition in developing countries. Different theories can be applied to explore alternative explanations to energy transition which may not necessarily begin from technological innovation. This dissertation builds on the applications of the MLP framework in the existing literature, particularly on the shifting of the focus of inquiry to the dynamics at the sociotechnical regime level and the role of the agency therein. This focus positions this study within the politics and power and the role of policymaking research sub-streams within the MLP literature.

This study then applies historical institutionalism to fill in the gap identified in the sociotechnical transition literature.

## 2.5. Historical Institutionalism

Historical institutionalism is chosen for this study due to its conceptual alignment with the processes observed in the MLP framework.<sup>124</sup> It complements sociotechnical transition approach by offering tools for explicit analysis of institutional dynamics, especially at the MLP's sociotechnical regime level. Historical institutionalism is a theoretical framework that emphasises the role of institutions, comprising formal and informal rules, norms, cultural beliefs and societal expectations,<sup>125</sup> in shaping political outcomes.<sup>126</sup> It focuses on the temporal processes and sequences that lead to institutional formation and change. Central to this approach are the

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<sup>124</sup> Andrews-Speed, P. (2016). Applying Institutional Theory to the Low-Carbon Energy Transition. *Energy Research & Social Science*, 13, 216 – 225.

<sup>125</sup> See: North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press; Williamson, O. E. (2000). The New Institutional Economics: Taking Stock and Looking Ahead. *Journal of Economic Literature*, 37, 595 – 613; Aoki, M. (1996). Towards a Comparative Institutional Analysis: Motivations and Some Tentative Theorising, *The Japanese Economic Review*, (47)(1), 1 – 19; and Greif, A. (1994). Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies, *Journal of Political Economy*, 102, 912 – 950.

<sup>126</sup> Thelen, K. (1999). Historical Institutionalism in Comparative Politics. *Annual Review of Political Science*, 2, 369 – 404.

concepts of critical junctures and path dependency, which highlight how initial choices or events can set institutions on specific developmental trajectories that are difficult to alter.

The conceptual alignment between sociotechnical regime and institution that makes the application of historical institutionalism relevant is as follows. Sociotechnical regime constitutes a composite of systems that are built in support of the development and use of certain technologies.<sup>127</sup> It embodies rules, practices and networks<sup>128</sup> in addition to techniques and artefacts. It also considers markets, policies, laws and regulations, and recognises the impacts of beliefs, values, expectations and cognitive routines of various actors that are involved in the energy sector.<sup>129</sup> The identification of rules, ideas or beliefs, values or norms, and cognitive routines as part of sociotechnical regime bears close semblance to what constitutes institution.<sup>130</sup>

In the context of low-carbon energy transition, the incumbent sociotechnical regime that has been dominated by fossil fuels, or is often referred to as carbon lock-in,<sup>131</sup> resembles historical institutionalism's concept of path dependency. Pressures from niche and landscape levels that can potentially lead to a change in regime-level trajectory are analogous to the critical juncture concept within historical institutionalism literature.<sup>132</sup> These conceptual similarities have led to the widespread application of historical institutionalism in examining energy transitions, particularly in relation to policies,<sup>133</sup> underscoring its utility and proven effectiveness in this field.

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<sup>127</sup> Smith, et al. *The Governance of Sustainable Socio-technical Transitions*.

<sup>128</sup> Rip and Kemp. *Technological Change*.

<sup>129</sup> Geels. *Technological Transitions as Evolutionary Reconfiguration Processes*.

<sup>130</sup> See: North. *Institutions, Institutional Change and Economic Performance*; Williamson. *The New Institutional Economics*.

<sup>131</sup> Unruh. *Understanding Carbon Lock-in*.

<sup>132</sup> Capocchia, G. and Kelemen, R.D. (2007). The Study of Critical Junctures: Theory, Narrative, and Counterfactuals in Historical Institutionalism. *World Politics*, 59, 341 – 369.

<sup>133</sup> See: Kern, F. (2011). Ideas, Institutions and Interests: Explaining Policy Divergence in Fostering 'System Innovations' towards Sustainability. *Environment and Planning C: Politics and Space*, (29)(6), 1116 – 1134; Lockwood, M., Kuzemko, C., Mitchell, C., and Hoggett, R. (2017). Historical Institutionalism and the Politics of Sustainable Energy Transitions: A Research Agenda. *Environment and Planning C: Politics and Space*, (35)(2), 312 – 333; and Roberts, C., and Geels, F. W. (2019). Conditions for Politically Accelerated Transitions: Historical Institutionalism, the Multi-Level Perspective, and Two Historical Case Studies in Transport and Agriculture. *Technological Forecasting and Social Change*, 140, 221 – 240.

Another justification for choosing historical institutionalism is its prominence as a leading approach in comparative politics.<sup>134</sup> This approach is sensitive to cross-national differences as it is applied to examine how the evolution of structures lead to different outcomes in different countries. The design of historical institutionalism is therefore suitable to examine the varied progress in low-carbon energy transition in the Philippines and Indonesia.

Historical institutionalism, a strand within new institutionalism theory that emerged as a counterforce to the spread of behaviouralism in the 1960s and 1970s, explores how institutions set the boundaries for actions and outcomes and examines their origins and transformations.<sup>135</sup> New institutionalism reclaims the significance of institutions, a focus that was central to old institutionalism prior to the rise of behaviouralism, while moving beyond old institutionalism's emphasis on formal organisational structures.<sup>136</sup>

Although new institutionalism encompasses three main schools of thought namely historical institutionalism, rational choice institutionalism, and sociological institutionalism,<sup>137</sup> this dissertation specifically applies historical institutionalism because it provides a comprehensive framework to examine the emergence, persistence, and change of institutions, highlighting the interplay between structure and agency in these processes.<sup>138</sup> This perspective aligns with observations in the MLP regarding regime dynamics and the role of agency as drivers of change.

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<sup>134</sup> Thelen, K. and Steinmo, S. (1992). Historical Institutionalism in Comparative Analysis. In S. Steinmo, K. Thelen, and F. Longstreth (eds.) *Structuring Politics: Historical Institutionalism in Comparative Analysis*. Cambridge: Cambridge University Press, 1 – 32.

<sup>135</sup> Hall and Taylor. *Political Science and Three New Institutionalisms*.

<sup>136</sup> Thelen and Steinmo. *Historical Institutionalism in Comparative Politics*.

<sup>137</sup> See: Hall and Taylor. *Political Science and Three New Institutionalisms*; and Koning, E. A. (2016). The Three Institutionalisms and Institutional Dynamics: Understanding Endogenous and Exogenous Change, *Journal of Public Policy*, (36)(4), 639 – 664.

<sup>138</sup> Thelen, K. (2009). Institutional Change in Advanced Political Economies. *British Journal of Industrial Relations*, (47)(3), 471 – 498.

The choice for historical institutionalism is further justified by its comprehensive analytical framework, which shares concepts with the other two strands of new institutionalism.<sup>139</sup> For example, like rational choice institutionalism, historical institutionalism recognises that actors may act strategically within institutional constraints. However, unlike rational choice institutionalism, which presupposes actors having a fixed set of preferences and making extensive calculative moves to maximise their chances of attaining these preferences,<sup>140</sup> historical institutionalism does not pre-determine actors' strategic goals. Instead, it seeks explanations through empirical events and considers the spatial and temporal contexts within which institutions emerge.<sup>141</sup> By not assuming fixed goals, historical institutionalism encourages a more comprehensive analysis of how and why actors change their strategies over time. This complements MLP's goal of understanding the multi-faceted nature of transitions and the various pathways through which they occur.

Similarly, like its sociological institutionalism counterpart, historical institutionalism recognises the impact of institutions on actors' identities through moral or cognitive scripts. In the context of energy transition, however, historical institutionalism can better explain the complex interactions within the wider socio-technical regime compared to sociological institutionalism given that the latter has primarily been applied within organisational settings.<sup>142</sup> Historical institutionalism's approach, which regards state-society relations as an important part of analyses,<sup>143</sup> therefore provides a more fitting approach to examine energy transition. It captures

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<sup>139</sup> See: Lowndes V., and Roberts, M. (2013). *Why Institutions Matter: The New Institutionalism in Political Science*. Basingstoke: Palgrave Macmillan; and Thelen, K. (2002). The Explanatory Power of Historical Institutionalism, In R. Mayntz. (ed.) *Akteure–Mechanismen–Modelle: Zur Theoriefähigkeit Makro-Sozialer Analysen*. Frankfurt/New York: Campus Verlag, pp. 99 – 107.

<sup>140</sup> Hall and Taylor. *Political Science and Three New Institutionalisms*.

<sup>141</sup> Thelen. *Historical Institutionalism in Comparative Politics*.

<sup>142</sup> Nilsson, M., Nilsson, L. J., Hildingsson, R., Stripple, J., and Eikeland, P. O. (2011). The Missing Link: Bringing Institutions and Politics into Energy Future Studies. *Futures*, (43)(10), 1117 – 1128; and Genus, A., and Mafakheri, F. (2014). A New-Institutional Perspective of Supply Chains and Energy Security: Bioenergy in the UK. *Applied Energy*, 123, 307 – 315.

<sup>143</sup> See: Hall, P. A. (1997). The Role of Interests, Institutions, and Ideas in the Comparative Political Economy of Industrialised Nations, In M. I. Lichbach and A. S. Zuckerman. (eds.) *Comparative Politics:*

the political aspects of these dynamics more effectively than sociological institutionalism that emphasises cognitive dimensions.<sup>144</sup>

Additionally, historical institutionalism is sensitive to context.<sup>145</sup> This aligns with the fundamental principles of sociotechnical transition which recognise the social environments surrounding technologies use. The context referred to by historical institutionalism includes institutional structures, their legacies, and the timing of their formation. Historical institutionalism maintains that actors' preferences are formulated within the constraint of institutions<sup>146</sup> rather than being exported from elsewhere. The emphasis on context is further demonstrated by historical institutionalism's sensitivity to timing,<sup>147</sup> which is critical in understanding institutional change.<sup>148</sup>

Having demonstrated conceptual alignment between the MLP framework and historical institutionalism, the subsequent analysis delves deeper into the key concepts of critical juncture, legacy or path dependency, and incremental change within historical institutionalism. While the conceptual convergence between the MLP and historical institutionalism frameworks is evident, one key difference is observed, and that is historical institutionalism's emphasis on explaining stability and change from a historical perspective. The MLP framework also understands that change is a process and therefore happens within a certain time frame, but the emphasis does not lie there. In fact, the emphasis of the MLP framework in explaining change resembles more like a critical juncture in historical institutionalism, but without taking into account the processes that

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*Rationality, Culture and Structure*. New York: Cambridge University Press, pp. 174 – 207; Morgan, G., Campbell J. L., Crouch C., Pedersen, O. K., and Whitley, R. (2010). *The Oxford Handbook of Comparative Institutional Analysis*. Oxford: Oxford University Press; and Thelen and Steinmo. *Historical Institutionalism in Comparative Politics*.

<sup>144</sup> See: DiMaggio, P., and Powell, W. (1991). Introduction. In W. Powell, and P. DiMaggio. (eds.) *The New Institutionalism in Organizational Analysis*. Chicago: University Chicago Press; and Katzenstein, P. J. (1996). *Cultural Norms and National Security: Policy and Military in Postwar Japan*. Ithaca, NY: Cornell.

<sup>145</sup> Bates, R., Greif, A., Levi, M., Rosenthal, J., and Weingast, B. (2000). "Analytic Narratives" Revisited. *Social Science History*, (24)(4), 685 – 696.

<sup>146</sup> Zysman, J. (1994). How Institutions Create Historically Rooted Trajectories of Growth. *Industrial and Corporate Change*, (3)(1), 243 – 283.

<sup>147</sup> Orren and Skowronek. *Beyond the Iconography of Order*.

<sup>148</sup> Thelen. *Institutional Change in Advanced Political Economies*.

lead to such critical juncture. In this regard, the application of historical institutionalism aptly complements the use of MLP framework because it will enable the tracing the historical pathway and the identification of critical junctures that subsequently lead to low-carbon energy transition.

A critical juncture is defined as “a period of significant change, which typically occurs in distinct ways in different countries (or in other units of analysis) and which is hypothesised to produce distinct legacies.”<sup>149</sup> Certain moments in history, often prompted by external shocks such as wars, revolutions, or economic crises, present unique opportunities for significant change<sup>150</sup> because the usual constraints imposed by existing institutions are loosened, providing actors with greater agency to make decisions that can fundamentally alter the trajectory of institutional development.

Critical junctures are identified through a close analysis of the timing and impact of events. These periods are not uniform across all institutions; an event may constitute a critical juncture for one institution while leaving others unaffected.<sup>151</sup> In other words, an event that constitutes a critical juncture for the Philippines may not have the same impact on Indonesia, or vice versa, leading to different trajectories in their energy sectors. This difference can offer a causal explanation for the varying progress in low-carbon energy transitions between the two countries.

A critical juncture often takes place within antecedent conditions<sup>152</sup> that can lead to its occurrence. The concept of “near-misses” further refines the understanding of critical junctures by considering instances where important change almost happened but did not, thereby giving insights into why certain pathways were preferred over others.<sup>153</sup> These “near-misses” suggest the contingent nature of institutional development and emphasise the significance of specific conditions and choices that need to exist for critical junctures to occur.

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<sup>149</sup> Collier and Collier. *Shaping the Political Arena*, p. 29.

<sup>150</sup> Thelen. *Institutional Change in Advanced Political Economies*.

<sup>151</sup> Capoccia and Kelemen. *The Study of Critical Junctures*.

<sup>152</sup> Collier and Collier. *Shaping the Political Arena*.

<sup>153</sup> Capoccia, G. (2015). Critical Junctures and Institutional Change. In J. Mahoney and K. Thelen (eds.) *Advances in Comparative Historical Analysis*. Cambridge: Cambridge University Press, 147 – 179.

One of the key debates in critical juncture analysis is contrasting earlier works' emphasis on structures and the more recent focus on agency and choice in effecting change.<sup>154</sup> The latter's emphasis on the role of actors is based on the idea that actors have a broader range of feasible options during critical junctures, and their decisions can significantly impact institutional pathways. The study of critical junctures in historical institutionalism thus provides valuable insights into the processes of institutional change and development.

The concept of critical junctures is closely related to the punctuated equilibrium model of change, which suggests that institutional development is characterised by long periods of stability (equilibrium) punctuated by short intervals of significant change (punctuation).<sup>155</sup> During equilibrium periods, institutions are generally stable, and changes are usually incremental, driven by endogenous adjustments that maintain the overall structure. However, during punctuation periods, significant exogenous shocks can lead to rapid and transformative changes.

A legacy, or a path dependent, is a key element in historical institutionalism. It is defined as the "outcomes [of]... a crucial transition [that] establishes distinct trajectories."<sup>156</sup> Path dependence is established within a context that emphasises the effects of historical past, initial conditions, contingent events, historical lock-in, self-reproducing mechanisms, and reactive sequences.<sup>157</sup> The conceptualisation of path dependence is informed by increasing return mechanism found in economic theories, which puts forward the concept of positive feedback, illustrating the increased benefits of an action as it is repeated, leading to potential lock-in effects.<sup>158</sup> The positive feedback thus reinforces a certain possible outcome depending on the sequence of processes that is

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<sup>154</sup> Capoccia, G. (2016a). Critical Junctures. In O. Fioretos, T. G. Falleti, and A. Sheingate (eds.) *The Oxford Handbook of Historical Institutionalism*. Oxford: Oxford University Press, 89 – 106.

<sup>155</sup> Thelen. *Institutional Change in Advanced Political Economies*.

<sup>156</sup> Collier and Collier. *Shaping the Political Arena*, p. 28.

<sup>157</sup> Mahoney, J. and Schensul, D. (2006). Historical Context and Path Dependence. In R. E. Goodin and C. Tilly (eds.) *Oxford Handbook of Contextual Political Analysis*. Oxford: Oxford University Press, 454 – 471.

<sup>158</sup> Pierson, P. (2000). Increasing Returns, Path Dependence, and the Study of Politics. *The American Political Science Review*, (94)(2), 251 – 267.

chosen.<sup>159</sup> Given the importance of choices and sequences, initial policy choices, institutional designs, and political decisions are critical in shaping the trajectory of political systems. Over time, the increasing return mechanism enforces the preferences for these initial choices, rendering significant changes difficult and unlikely without substantial external shocks or disruptions. Legacy or path dependence thus leads to institutional arrangements that shape and limit choices and practices, thereby highlighting the critical linkage between history and contemporary phenomena.

Although path dependency shapes institutional stability, institutions can experience change. A stimulus can act as a powerful catalyst that break path dependency resulting in critical junctures.<sup>160</sup> Critical juncture is not the only mechanism of change, however, given that institutional change can also occur incrementally through ongoing political, social, and economic interactions.<sup>161</sup> Mahoney and Thelen propose four mechanisms of incremental changes namely layering, conversion, drift and displacement.<sup>162</sup> *Layering* is characterised by a gradual transformation of institutional structure and behaviour through the introduction of new rules alongside existing ones. *Conversion* refers to the redirecting of institutions towards new objectives, often through a redefinition of their functions. *Drift* occurs when institutions lose its relevance and effectiveness following a failure to adapt to changes in their environment. *Displacement* involves removing and replacing existing institutions with new ones, often in response to shifting power dynamics or external pressures.

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<sup>159</sup> Pierson, P. (2004). *Politics in Time: History, Institutions, and Social Analysis*. Princeton, NJ: Princeton University Press.

<sup>160</sup> See: Mahoney, J. (2000). Path Dependence in Historical Sociology. *Theory and Society*, (29)(4), 507 – 548; and Capoccia and Kelemen. *The Study of Critical Junctures*.

<sup>161</sup> Thelen, K. and Conran, J. (2016). Institutional Change. In O. Fioretos, T. G. Falleti, and A. Sheingate (eds.) *The Oxford Handbook of Historical Institutionalism*. Oxford: Oxford University Press, 51 – 70.

<sup>162</sup> Mahoney, J. and Thelen, K. (2009). A Theory of Gradual Institutional Change. In J. Mahoney, K. Thelen (eds.) *Explaining Institutional Change: Ambiguity, Agency, and Power*. New York: Cambridge University Press, 1 – 37.

The incremental change approach thus posits that institutions are inherently dynamics. The dynamism is caused by distributional effects of power manifested in tension and pressures arising from the contestation surrounding power and compliance. This issue arises given that institutional outcomes often create losers who then will continue to seek changes from within.<sup>163</sup>

Mahoney and Thelen add a crucial dimension to the discussion by focusing on the role of agency in these processes, which can be categorized into four types, namely parasitic symbionts, subversives, insurrectionaries, and opportunists, based on their strategies and objectives.<sup>164</sup> *Parasitic symbionts* exploit gaps in compliance and subtly transform institutions over time. *Subversives* covertly change institutions by integrating new ideas, leading to layering, while outwardly supporting institutions. *Insurrectionists* openly challenge and attempt to remove existing institutions, resulting in displacement. *Opportunists* look for opportunities to offer fresh definition to existing institutional frameworks, leading to conversion.

Capoccia contributed to this theoretical development by focusing on the conditions that enable existing institutions to respond and resist the processes behind endogenous changes, thereby maintain stability.<sup>165</sup> The conditions include the entrenchment of cultural elements such as norms and values that can constrain institutional change, and the concentration of power over the timing of institutional reform in the hands of incumbent institutions. These mechanisms can thus delay, channel, or prevent institutional change, thereby preserving the status quo.

This dissertation applies comparative historical analysis methodology to conduct a rigorous comparative analysis between the Philippines and Indonesia. Comparative historical analysis is an approach designed to understand social and political phenomena by comparing historical sequences and outcomes across different contexts.<sup>166</sup> It is commonly applied to examine large-

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<sup>163</sup> Thelen and Conran. *Institutional Change*.

<sup>164</sup> Mahoney and Thelen. *A Theory of Gradual Institutional Change*.

<sup>165</sup> Capoccia, G. (2016b). When Do Institutions Bite? Historical Institutionalism and the Politics of Institutional Change. *Comparative Political Studies*, (49)(8), 1095 – 1127.

<sup>166</sup> Mahoney, J. (2004). Comparative-Historical Methodology. *Annual Review of Sociology*, 30, 81–101.

scale outcomes such as, among others, revolutions, welfare and political regimes, state formation and restructuring<sup>167</sup> by employing empirical case studies to enable detailed examination of specific cases. Embodying historical institutionalism principles, this methodology pays attention to the temporal dimensions and recognises that outcomes are often shaped by historical sequences and processes over time.<sup>168</sup>

In contrast to the orientation of statistical analysis that estimates the effects of chosen variables across many cases, comparative historical analysis adopts a causes-of-effects approach to understand the specific causes that led to certain outcomes, often treating causal factors as necessary or sufficient for the outcomes of interest, thereby emphasising the complexity and contingency of causal relationships.<sup>169</sup>

Comparative historical analysis allows systematic comparison of specific cases through sequential method that identifies events, occurrences, sequences, and processes, and integrates cross-case analysis using methods such as Mill's methods of agreement and difference, as well as within-case analysis using methods such as process tracing.<sup>170</sup> The comparative sequential method is an important method that enables the identification of common patterns and divergences that can explain different outcomes.<sup>171</sup>

Process tracing is an especially relevant tool used to identify and test causal mechanism within case studies, and is crucial for validating causal hypotheses, particularly when explanatory and

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<sup>167</sup> Thelen, K. and Mahoney, J. (2015). Comparative-Historical Analysis in Contemporary Political Science. In J. Mahoney and K. Thelen (eds.) *Advances in Comparative-Historical Analysis*. Cambridge: Cambridge University Press, 3 – 36.

<sup>168</sup> Thelen and Mahoney. *Comparative-Historical Analysis in Contemporary Political Science*.

<sup>169</sup> Mahoney, J. and Terrie, P.L. (2008). Comparative-Historical Analysis in Contemporary Political Science. In H. Brady, J. M. Box-Steffensmeier, and D. Collier (eds.) *Oxford Handbook of Political Methodology*. Oxford: Oxford University Press, 737 – 755.

<sup>170</sup> Falletti, T. and Mahoney, J. (2015). The Comparative Sequential Method. In J. Mahoney and K. Thelen (eds.) *Advances in Comparative-Historical Analysis*. New York: Cambridge University Press, 211 – 239.

<sup>171</sup> Capoccia. *Critical Junctures and Institutional Change*.

outcome variables are separated by long periods.<sup>172</sup> Process tracing necessitates deep understanding of the case history and knowledge of relevant preexisting theories, combined with logical reasoning of specific case facts and general knowledge.<sup>173</sup>

In summary, a study that applies historical institutionalism concepts demonstrates attributes such as causes-of-effects approach, necessary or sufficient conception of causation, and process-tracing method.<sup>174</sup>

## 2.6. The MLP and Historical Institutionalism in Energy Transition Studies

The conceptual alignment between the MLP framework and institutionalism has led to studies that apply both approaches to examine various aspects of energy transitions, including renewable energy development, fossil fuel phase out, among others.

Having argued extensively why institutionalism can explain the dynamics at the sociotechnical regime level, Andrews-Speed examined how two contrasting social orders such as open access in the United Kingdom and limited access in China influenced adaptive capacity for energy transition.<sup>175</sup> Furthermore, the study also considered how different policy paradigms (state-centric or market-oriented) governing the energy sector can influence energy transition progress.

Lockwood et al. argued that historical institutionalism can be applied to understand the different transition outcomes in view of varied institutional arrangements, development and change.<sup>176</sup>

They observed that different political systems influence the adoption of environmental policies.

For instance, countries with proportional representation systems tend to implement

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<sup>172</sup> Mahoney, J. and Villegas, C.M. (2007). Historical Enquiry and Comparative Politics. In C. Boix and S. C. Stokes. (eds.). *The Oxford Handbook of Comparative Politics*. Oxford: Oxford University Press, 73 – 89.

<sup>173</sup> Mahoney, J. (2015). Process Tracing and Historical Explanation. *Security Studies*, (24)(2), 200 – 218.

<sup>174</sup> Mahoney and Terrie. *Comparative-Historical Analysis in Contemporary Political Science*.

<sup>175</sup> Andrews-Speed. *Applying Institutional Theory to the Low-Carbon Energy Transition*.

<sup>176</sup> Lockwood et al. *Historical Institutionalism and the Politics of Sustainable Energy Transitions*.

environmental initiatives more effectively than those with majoritarian systems. This is due to proportional representation systems incentivising broader support for public goods and allowing smaller, often environmentalist, parties to exert significant influence.

Similarly, institutional veto players, defined as individuals or groups whose agreement is necessary to affect changes, impacted the speed and direction of energy transitions. In Germany, its federalist system enabled diverse approaches to sustainable energy because the system allowed for regional experimentation and political negotiation. Although experimentation and negotiation could sometimes slow down uniform policy implementation, they could also encourage innovation and localised solutions to sustainable energy. In contrast, the UK's institutional arrangement that allowed for the delegation of policymaking authority, which aimed at reducing political risk, could potentially introduce new veto players whose interests may not be in line with sustainable energy transition goals. For example, the delegation of policymaking authority to the Office of Gas and Electricity Markets (Ofgem), who focused on economic regulation and market competition, had slowed the transition towards sustainability despite the UK government's efforts to promote low-carbon policies.

Laird and Stefes used path dependency concept to examine why renewable energy expansion in Germany was more progressive than the United States by the year 2000s despite a comparable start in the 1970s.<sup>177</sup> The study looked at the changes in State support for renewable energy R&D and incentives since the 1970s oil crisis and observed significant increase in government spending for the R&D of alternative energy sources, notably nuclear and coal, in Germany. The increase in financial support converged with the forging of alliance between renewable energy advocates and some of the German Bundestag (the national parliament) members, some of whom were founders of new renewable energy associations. The support for renewable sources also came from the

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<sup>177</sup> Frank, N. L., and Stefes, C. (2009). The Diverging Paths of German and United States Policies for Renewable Energy: Sources of Difference, *Energy Policy*, 37, 2619 – 2629.

Bundestag Enquete Commission on Climate Change who advised emission reduction in the late 1980s,<sup>178</sup> shortly after the Three Mile Island nuclear power plant incident in 1979. The resultant growing aversion towards nuclear use, combined with the intention to reduce carbon emissions, created a favourable condition to promote renewable energy uses. This subsequently led to the parliament passing the feed-in-tariff (FiT), which draft bill had the support from both the conservatives and the opposition the Green and Social Democratic (SPD) parties.

The American government had likewise increased its spending on alternative energy sources following the 1973 oil crisis.<sup>179</sup> However, energy became a highly political and partisan issue in 1981 during President Reagan, who decided to aggressively abandoned renewable energy.<sup>180</sup> Although it subsequently became less politicised in the 1990s, the budget allocation for renewable energy R&D remained a political issue as evidenced by the fluctuating spendings in the 1990s and 2000s depending on the political support given by the Congress.<sup>181</sup> In addition to political factor, Laird and Stefes also observed how oil, as part of sociotechnical regime, had more influence on the United States' energy policies compared to Germany, with the former seemingly losing interest in renewable energy when oil prices got stabilised or cheaper.

Laird and Stefes identified institutional and social relations in each country as the driving factors.<sup>182</sup> These include increased demand for employments in former Eastern Germany following the country's reunification post-Cold War, the role of wind and small hydropower in attracting economic interests and providing jobs in the area, the political and financial support provided by the BMU (present day Federal Ministry for the Environment, Nature Conservation

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<sup>178</sup> Lauber, V., and Mez, L. (2006). Renewable Electricity Policy in Germany, 1974-2005. *Bulletin of Science, Technology & Society*, (26)(2), 105 – 120.

<sup>179</sup> Laird, F. N. (2001). *Solar Energy, Technology Policy, and Institutional Values*. New York: Cambridge University Press.

<sup>180</sup> Laird, F. N. (2003). Constructing the Future: Advocating Energy Technologies in the Cold War. *Technology and Culture*, (44)(1), 27 – 49.

<sup>181</sup> Laird, F. N., and Stefes, C. (2009). The Diverging Paths of German and United States Policies for Renewable Energy: Sources of Difference. *Energy Policy*, 37, 2619 – 2629.

<sup>182</sup> Frank and Stefes. *The Diverging Paths of German and United States Policies for Renewable Energy*.

and Nuclear Safety) to renewable energy associations, and the rise of the Greens in the federal government in 1998 when support for renewable energy was waning.

Additionally, Laird and Stefes showed that it was neither public opinion nor comparative technological advantage that had led to divergent renewable energy trajectories in the two countries.<sup>183</sup> Not only was public opinion comparable in the two countries;<sup>184</sup> but it also had limited influence, as it tended to follow State support for renewable energy rather than drive it.<sup>185</sup> Moreover, while the MLP posits that innovations acted as the main driver of change, it was observed that Germany was not the first mover in renewable energy technology innovations, and both Germany and the United States could have benefited from their capability to manufacture renewable energy technologies, thus leading to a conclusion that it was institutional structures, contingent circumstances, and political and policy framing of renewable energy that played a role in affecting different policy trajectories in the two countries.<sup>186</sup>

Cherp et al. examined the displacement of nuclear energy from sociotechnical regime and the development of renewable sources as part of niche-innovations in Germany and Japan, and underscored that the different energy trajectories in the two countries was attributed to differences in national energy policies.<sup>187</sup> While both countries began to develop renewable policies and support renewable R&D after the 1970s oil crisis, the subsequent implications on nuclear industry differed significantly. By the 1990s, Germany began to leave nuclear and showed greater preference for wind and solar. On the contrary, Japan's nuclear sector remained strong even after the 2011 Fukushima incident.

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<sup>183</sup> Laird and Stefes. *The Diverging Paths of German and United States Policies for Renewable Energy*.

<sup>184</sup> Brewer, T.L. (2003). Where is the Transatlantic Divide in Public Opinion on Climate Change Issues? Evidence for 1989–2002. *Centre for European Policy Studies (CEPS) Policy Brief no.35*. Brussels: CEPS.

<sup>185</sup> Lauber and Mez. *Three Decades of Renewable Electricity Policies in Germany*.

<sup>186</sup> Laird and Stefes. *The Diverging Paths of German and United States Policies for Renewable Energy*.

<sup>187</sup> Cherp, A., Vinichenko, V., Jewell, J., Suzuki, M., and Antal, M. (2017). Comparing Electricity Transitions: A Historical Analysis of Nuclear, Wind and Solar Power in Germany and Japan. *Energy Policy*, 101, 612 – 628.

Cherp, et al., observed that despite nuclear initially having a major role in Germany's energy mix, the relationship between the State and the private sector eventually weakened due to the government's perception on incoming pressures on nuclear, and the increasing political support for coal and renewable energy sources.<sup>188</sup> By contrast, in Japan, alternative energy sources received no such political support, resulting in nuclear energy facing no competition. The findings in this study further suggest that the presence of innovation itself did not necessarily act as the main driving force behind energy transition given that it was ultimately up to the State to decide which technologies to pursue and develop more.

At this juncture, it is observed that institutions being examined within the context of energy transition encompass a broad range of elements including social orders (whether open access or limited access), policy-paradigm (state-centric or market-oriented), funding support mechanisms from the State, State's decisions, institutional and social relations, among others. A common feature observed in these studies is the State involvement in the energy sector being an important variable influencing energy transition.

While institutionalism has been applied to examine energy transitions in developed countries, it is yet to be applied in the same way to study energy transitions in developing countries. Using the MLP framework and political economy perspective as the guiding theory, Baker et al. examined low-carbon energy transition in South Africa by assessing the relations between Eskom (the state-run coal-generated electricity utility) and minerals-energy complex (MEC) that played a central role in the South African economy.<sup>189</sup> The Energy Intensive User's Group (EIUG), which was part of the MEC, made up of resource and mining industries that held the monopoly over coal production in South Africa. The EIUG was a big electricity user in the country. The study drew heavily from political economy view about the energy industry having the power to represent

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<sup>188</sup> Cherp, et al. *Comparing Electricity Transitions*.

<sup>189</sup> Baker et al. *The Political Economy of Energy Transitions*.

*capital in general* given the close interrelation between economic growth and energy production and consumption.<sup>190</sup> Baker et al. observed that political resistance and technological lock-in characterised energy politics, and argued that the mutually beneficial relationship between the EIUG and the government had created a strong sociotechnical regime that was resistant to change.<sup>191</sup> To illustrate, the study examined three renewable-related initiatives namely the Renewable Energy Independent Power Producers Procurement Programme, the Integrated Resource Plan for Electricity, and the Clean Development Mechanism. It concluded that the close relation between political and economic elites limited the space for change until such time when businesses perceive that alternative energy sources can serve their profit-making interests.

While Baker et al. looked at the interactions between the State through state-owned Eskom and the private sector, Newell and Phillips applied the MLP framework by drawing from political economy concepts to study energy transition in Kenya by examining the interactions of actors at the landscape level (the donors and transnational capital) and at the sociotechnical regime level (the State).<sup>192</sup> It used neoliberalism to explain the politics of transition, arguing that those who have control over production, finance, and technology, are critical actors in energy transition. It was based on a view that the loci of power, especially by the private sector and the global institutions, may affect transition. The study posited that the rules and regulations in the energy sector embody power and social relations. This thus affects which technologies are included or excluded in the national energy mix, and which social issues get prioritised and de-prioritised in the process. The study observed that donors' and transnational capital's agenda to introduce renewable energy was not completely compatible with Kenyan national agenda of eradicating energy poverty. However, given the power and influence that these landscape actors had on the State, the Kenyan government had to juggle among contradicting goals including attaining

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<sup>190</sup> Newell, P., and Paterson, M. (1998). Climate for Business: Global Warming, the State and Capital. *Review of International Political Economy*, (5)(4), 679 – 704.

<sup>191</sup> Baker, et al. *The Political Economy of Energy Transitions*.

<sup>192</sup> Newell and Phillips. *Neoliberal Energy Transitions in the South*.

universal energy access, maintaining some share of fossil fuels in the energy mix, and also pursuing low-carbon growth.

These studies thus show that the State's interaction with another actor (be it the private sector or donors or transnational capital) is critical in influencing energy transition. In other words, the power dynamics between the State and the loci of power outside of the State has a considerable influence on energy transition. A review of existing literature on energy transitions in the Philippines and Indonesia is necessary to identify which non-state actors have the most relevance in both countries.

## 2.7. Existing Studies on the Philippines and Indonesia

Existing studies on low-carbon energy transition in the Philippines and Indonesia apply diverse concepts and examine different aspects about low-carbon energy transition in both countries. Guided by power exercise concepts, Saculsan and Mori applied the MLP framework to examine low-carbon energy transition in the Philippines. They observed that loci of powers lied in the hands of external actors (multilateral banks and foreign investors) and regime incumbents (energy oligarchs and the government), and they have converged to move the direction of the Philippine energy sector toward favouring the use of coal.<sup>193</sup>

Jakob et al. developed Actors, Objectives, Context (AOC) framework to assess the political economy of energy and climate policies in India, Indonesia, and Vietnam, and they observed that, in Indonesia, coal development had important political relevance.<sup>194</sup> They maintained that state-owned National Electricity Company (Perusahaan Listrik Negara/PLN) played key roles and

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<sup>193</sup> Saculsan, P. G., and Mori, A. (2020). Why Developing Countries Go through an Unsustainable Energy Transition Pathway? The Case of the Philippines from a Political Economic Perspective. *Journal of Sustainability Research*, 2(2), e200012.

<sup>194</sup> Jakob, M., Flachsland, C., Steckel, J. C., and Urpelainen, J. (2020). Actors, Objectives, Context: A Framework of the Political Economy of Energy and Climate Policy Applied to India, Indonesia, and Vietnam. *Energy Research & Social Science*, 70, 101775.

wielded considerable political influence in the country, and the coal industry was at the same time a powerful political actor that contributed to the financing of President Joko Widodo's election campaign in 2019.<sup>195</sup>

Applying the same AOC framework, a follow up study by Ordonez et al. examined Indonesia's envisioned development of new coal power plants and argued that the political barriers to low-carbon energy transition in Indonesia were attributed to President Joko Widodo's agenda of public infrastructure development and its role in shoring up his electability during the 2019 presidential campaign, the politically well-connected coal industry that lobbied for the construction of new coal power plants, and the coal industry's contributions to local and national incomes.<sup>196</sup>

Another study by Ohlendorf et al. examined the political economy of coal phase-out in countries that had substantial coal utilisation and reserves, of which the Philippines and Indonesia are part of the case studies.<sup>197</sup> This study started with the initial assumption that such countries are homes to established and powerful coal industry, which are likely to pose significant challenges to achieving a timely coal phase-out.

At this juncture, it is evident that the private sector is identified in both the Philippines and Indonesia as an important actor bearing influence on energy transition. This makes the State relation with the private sector an important variable influencing energy transition in both countries.

Other existing work on the Philippines and Indonesia focused their analyses on the sociotechnical regime level, particularly in relation to governance and policy analysis. Focusing on governance,

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<sup>195</sup> Jakob, et al. *Actors, Objectives, Context*.

<sup>196</sup> Ordonez, J. A., Jakob, M., Steckel, J. C., and Fünfgeld, A. (2021). Coal, Power and Coal-powered Politics in Indonesia. *Environmental Science and Policy*, 123, 44 – 57.

<sup>197</sup> Ohlendorf, N., Jakob, M., and Steckel, J. C. (2022). The Political Economy of Coal Phase-Out: Exploring the Actors, Objectives, and Contextual Factors Shaping Policies in Eight Major Coal Countries. *Energy Research & Social Science*, 90, 102590.

Marquardt examined the interaction between the central government and the subnational government.<sup>198</sup> He observed that the relations between central and local governments in decentralised countries such as the Philippines and Indonesia presented a major hurdle to renewable energy development.<sup>199</sup> Additionally, taking the Philippines as a case study, Marquardt highlighted that governance problems such as “unclear responsibilities, conflicting regulations, weak local capacity, a lack of awareness for national intentions and missing consultation” had hindered renewable energy development in the country, in addition to the local authorities overpowering the central government in its efforts to implement renewable energy law.<sup>200</sup>

Similarly, still on governance issue, Halimanjaya examined conflicting priorities among relevant agencies, most notably between state-owned National Electricity Company (PLN) and the Ministry of State-Owned Enterprises, the Ministry of Energy and Mineral Resources (MEMR), the Ministry of Industry, and the Ministry of Finance (MoF), and their repercussions of such conflicting priorities on fiscal policies.<sup>201</sup> These included the change in the MEMR’s FiT policies that have sent uncertain signals, the MoF’s sub-optimal non-FiT fiscal incentives, and the absence of fiscal policies that were necessary to incentivise large scale renewable energy development by small and medium investments.

La Viña et al. applied path dependency and lock-in concepts to analyse existing regulatory and techno-institutional landscape, and pointed out that they posed challenges to the Philippines’ efforts to balance the trilemma of energy security, equity, and sustainability that included renewable energy expansion.<sup>202</sup> The study identified the problems within existing regulatory

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<sup>198</sup> Marquardt, J. (2017a). *How Power Shapes Energy Transitions in Southeast Asia: A Complex Governance Challenge*. Abingdon, Oxon; New York, NY: Routledge.

<sup>199</sup> Marquardt. *How Power Shapes Energy Transitions in Southeast Asia*.

<sup>200</sup> Marquardt, J. (2017b). Central-Local Relations and Renewable Energy Policy Implementation in a Developing Country. *Environmental Policy and Governance*, (27)(3), p. 229.

<sup>201</sup> Halimanjaya, A. (2019). The Political Economy of Indonesia’s Renewable Energy Sector and Its Fiscal Policy Gap. *International Journal of Economics, Finance and Management Sciences*, (7)(2), 45 – 64.

<sup>202</sup> La Viña, A.G.M., Tan, J. M., Guanzon, T. I. M., Caleda, M. J., and Ang, L. (2018). Navigating a Trilemma: Energy Security, Equity, and Sustainability in the Philippines’ Low-Carbon Transition. *Energy Research & Social Science*, 35, 37 – 47.

landscape to encompass conflicting priorities between two key laws namely the Electric Power Industry Reform Act (EPIRA) and the Renewable Energy Act, and regulatory instability and uncertainty arising from leadership changes in the Department of Energy, given that the Secretary of Energy had the power to operationalise the implementation of laws and set priorities and direction in the energy sector. The study further identified the problems within existing techno-institutional landscape to include the situation of the national grid and policymakers' inability to anticipate technological advancements.

Yuliani focused on the effectiveness of the FiT policy instrument in bolstering renewable energy development in Indonesia, and observed a contradiction between the resulting increase in renewable energy investment since the introduction of FiT in 2011 and the real deployment of renewable energy power plants that lagged way behind.<sup>203</sup> She concluded that practical challenges pertaining to a complex governance structure, a lack of community awareness of renewable energy, and a poor coordination among related agencies had hampered effective project implementations.

At this juncture, it is apparent that various frameworks have been applied to examine different aspects of low-carbon energy transition in the Philippines and Indonesia. While they provide valuable insights into renewable energy development and low-carbon energy transition in both countries, the relatively short-term framework that underpins their studies tends to highlight challenges and shortcomings while overlooking a very important observation on the Philippines' relative progress compared to Indonesia. This indicates that there are other factors at play, which cannot be sufficiently captured by the short-term focus, and underscores the need to adopt a long-term perspective in the analysis to identify trends, patterns and causal factors that have contributed to the divergent outcomes in both countries.

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<sup>203</sup> Yuliani, D. (2017). Is Feed-In-Tariff Policy Effective for Increasing Deployment of Renewable Energy in Indonesia? In D. Arent, C. Arndt, M. Miller, F. Tarp, and O. Zinaman. (eds.). *The Political Economy of Clean Energy Transitions*. Oxford: Oxford University Press, pp. 144 –162.

In this regard, the application of historical institutionalism that considers the broader historical and institutional contexts, and traces historical events and decisions that have seen critical junctures, path dependencies and incremental changes, which subsequently shaped the transformation of energy policies leading to renewable energy development, can complement existing studies. Without a historical perspective, it is challenging to understand the long-term evolution of institutions and their impact on renewable energy policies. Historical institutionalism provides insights into how past institutional arrangements and governance structures have shaped current capabilities and constraints.

Similarly, while existing studies addressed political economy and power dynamics, the historical roots of these power structures are not fully examined. The application of historical institutionalism can uncover how historical economic interests and governance models were established and how they subsequently hindered or facilitated renewable energy development.

## 2.8. Summary

Historical institutionalism thus offers a valuable framework for analysing the development of energy sectors. In the context of energy transitions, historical institutionalism helps to understand how past decisions and institutional legacies influence contemporary energy policies and practices. The use of historical institutionalism as a theoretical framework justifies the necessity of tracing the historical pathways of energy sector back to its beginnings during the colonial era, given the underpinning comparative historical analysis approach that places emphasis on the analysis of critical junctures, path dependence, and incremental institutional changes that have influenced ongoing renewable energy development in both countries. By providing a thorough historical analysis, the research design ensures methodological rigour and a deeper exploration of the complex causal mechanisms underlying contemporary outcomes relating to low-carbon energy transition.

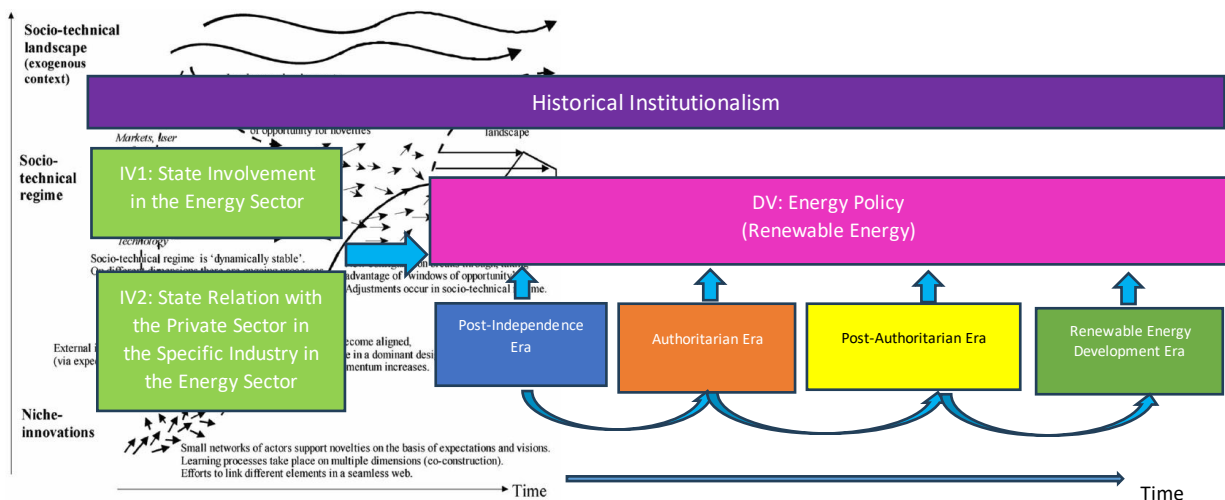
Having reviewed the relevant literatures, this study thus identifies State involvement in the energy sector and State relation with the private sector in the specific industry in the energy sector as the independent variables that affect the evolution of energy policies leading to renewable energy development (the dependent variable). State involvement in the energy sector is defined as the extent to which the State has ownership over the production outputs in the sector. State involvement can manifest in varied forms: in state-owned enterprises having direct investments and dealings with the day-to-day operations of energy production, in State having monopoly and control over the exploration and production of certain or all energy sources, in State lending support to energy production through, for example, a geographical survey to identify energy potential, as well as in State having regulatory and oversight functions. These different forms of involvement signify different levels of ownership, characterised by strong or weak. For example, State that has monopoly and control in the energy sector has deeper and stronger engagement in the sector compared to the State that only exercises regulatory and oversight functions. The contrast is observed clearly between a country that is governed by dictatorship and a country that is more market-based.

An examination of State relation with the private sector is important because private companies are often involved in energy provisions. The extent of their involvement, however, can be influenced by its relation with the State. The relationship can be complementary, synergistic, or somewhat antagonistic. The private sector may enjoy considerable autonomy, relatively free from State interventions, in making business decisions including in its investment choices on energy sources. In other instances, as often seen in regulated markets, the private sector's decisions and involvement may be guided or dictated by the State's agenda. In other instances, the State may intervene deep into the sector by excluding certain companies, such as foreign-owned ones, from taking part in the sector. Yet in other instances, the State may pro-actively provide support and incentives to encourage private companies to move to a certain direction to meet State's objectives.

The importance of the private companies' involvement in the energy sector is also related to their massive capital, specialised expertise, and overall contributions to the economy. These attributes give them certain power to exert their influence in the sector, primarily guided by their profit-making interests. Being a locus of power, an examination of *State relation with the private sector* is therefore essentially an assessment of power dynamics between the two.

The comparative historical analysis approach in this study examines the evolution of the identified variables in both countries by using process tracing within four periods namely: post-independence era, authoritarian era, post-authoritarian era, and renewable energy development era. This dissertation's conceptual and empirical contributions to the literature is depicted in Figure 2.2.

**Figure 2.2: The Application of Historical Institutionalism in the MLP's Sociotechnical Regime**



Source: Author, adapted from Geels and Schot (2007) from the original MLP diagram.

Accordingly, Chapters Three and Four provide empirical assessments of the interactions of the identified variables in four periods of analysis in the Philippines and Indonesia. Focusing on the Philippines, Chapter Three evaluates how *State involvement in the energy sector and State relation with the private sector in the specific industry in the energy sector* affected the transformation of energy policies leading to renewable energy development in the four periods.

The assessment will be attentive to the evolution of identified variables through the mechanisms of critical juncture, path dependence, and incremental changes. Chapter Four carries out the same analysis for Indonesia.

## Chapter 3

# Tracing the Philippine Pathway to Low-Carbon Energy Transition

### 3.1. Introduction

The application of historical institutionalism to examine the Philippines' contemporary low-carbon energy transition progress necessitates a process tracing along the country's energy sector trajectories. More specifically, the analysis aims to explain how the *State involvement in the energy sector* and the *State relation with the private sector* corresponded with the country's energy choices over time. To set the foundations for the analysis, this chapter begins by landscaping the beginnings of the Philippine energy sector during the colonial era. Following that, this chapter applies comparative historical analysis within four important periods, namely: the post-1946 independence era, the Marcos' Martial Law Era, the Post-Marcos Era, and the renewable energy development era. Based on the analysis, this chapter then evaluates the progress of low-carbon energy transition in the country.

### 3.2. The Founding of the Philippines Energy Sector (late 19<sup>th</sup> century to mid-1940s)

The founding of the Philippine energy sector began towards the end of the Spanish colonial era. From the start, the State, represented by the colonial government, assumed various roles within the energy sector. In the coal sector, *the State was more directly involved* as evidenced by its exploration and monopoly of coal mining in Guila-Guila, Cebu, post-1853.<sup>204</sup> Coal was first

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<sup>204</sup> Burritt, C. H. (1901). *The Coal Measures of the Philippines: A Rapid History of the Discovery of Coal in the Archipelago and Subsequent Development, with the Full Text of the Record of the MacLeod Coal Concession in Cebu, of the Uling-Lutac Coal and Railway Concession*. Washington: Government Printing Office., p. 16. <https://archive.org/details/coalmeasuresphi0oburrgoog/page/n6/mode/2up>

discovered during the Spanish colonial era in 1827 in Cebu,<sup>205</sup> and valuable coal deposits were subsequently found in different parts of the Philippines including Gotas-Butong, Dumanquilas Bay, Mindanao; Cebu Island; Polillo Island; Mindoro Island; and Masbate Island,<sup>206</sup> with Batan Island being the major coal site.<sup>207</sup> Domestic coal was mined by several companies, with Philippine Coal Mining Co holding around 76 percent share of total domestic production.<sup>208</sup> Aside from mining activities, *the involvement of the State* in the coal sector was also evident in the Philippine Bureau of Science commissioning a survey in 1911 to examine the quality of Philippine coal and determine the best way to utilise it.<sup>209</sup>

In the oil sector, the State was more involved in regulatory capacity as evidenced in the granting of permits for petroleum companies<sup>210</sup> and in the passage of an Act governing oil exploration, which applied to both the Philippine and the American citizens, by the Philippine legislature in August 1920.<sup>211</sup> Private companies, on the other hand, took on a more dominant role in oil exploration activities. Gas and petroleum reserves were found by Spanish geologist Abella in the Island of Panay in 1890, and the first drilling was conducted by British company Smith Bell & Co. near Toledo west coast of Cebu in 1898.<sup>212</sup> Subsequently, other companies such as the Bay Valley Oil Co. came to Tayabas area and carried out exploration attempts.<sup>213</sup> In the early 1920s, the Richmond Petroleum Company, a subsidiary of the Standard Oil Company of California, conducted drills on Bondoc Peninsula, Tayabas Province, Luzon.<sup>214</sup> By the 1920s, the world's

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<sup>205</sup> Smith, W. D. (1910, September). Philippine Coal. *The Far Eastern Review*, 120 – 124.

<sup>206</sup> Smith, W. D. (1925a, August). Coal in the Philippines. *The Far Eastern Review*, 558 – 563.

<sup>207</sup> Smith. *Philippine Coal*.

<sup>208</sup> (1922, May). Philippine Coal Supply. *The Far Eastern Review*, 309.

<sup>209</sup> (1911, January). Philippine Mining News. *The Far Eastern Review*, 287.

<sup>210</sup> Bullis. *Oil in the Philippines*.

<sup>211</sup> Smith, W. D. (1921, May). Petroleum in the Philippines. *The Far Eastern Review*, (XVII)(5), 307 – 311.

<sup>212</sup> Smith. *Petroleum in the Philippines*.

<sup>213</sup> The American Chamber of Commerce Journal in Manila. (1940, June). Search for Oil in the Philippines. *The Far Eastern Review*, (XXXVI)(6), 232.

<sup>214</sup> Smith. *Petroleum in the Philippines*.

consumption of oil had massively increased and spurred greater activities in oil exploration in the Philippines.<sup>215</sup>

Despite early explorations, oil and coal productions had not been sufficient to meet domestic demands. Although oil reserves were believed to be widespread in the country including in Leyte, Mindanao, Cebu, Mindoro, Panay, and Sulu Group,<sup>216</sup> the commercial values of the Philippines' domestic oil remained unestablished by 1947.<sup>217</sup> This situation had led the country to resort to oil import that was recorded to date back to the late 1910s, resulting in increased volume of petroleum product imports comprising crude oil, naphthas, illuminating oils and lubricating oils, between 1917 and 1920.<sup>218</sup>

In a similar vein, it was reported in 1925 that conducting coal business in the Philippines was challenging.<sup>219</sup> Furthermore, the Philippine coal was of inferior quality compared to Japanese and Australian coals.<sup>220</sup> Like oil, therefore, the Philippines had to rely on coal imports as far back as in the colonial era. In the 1920s, coal imports accounted for more than 90 percent of total coal available in the country.<sup>221</sup> For example, in 1920, coal imports exceeded 500,000 tons, while annual domestic production was only about 60,000 tons.<sup>222</sup> Coal and oil exploration, production and importation occurred despite the absence of a dedicated department to oversee the energy sector or formulate strategic plans for energy sources and their utilisation at that time.<sup>223</sup>

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<sup>215</sup> Bullis, H. E. (1922, April). Oil in the Philippines. *The Far-Eastern Review*, (XVIII)(4), 225 – 226.

<sup>216</sup> Smith, W. D. (1925b, September). Petroleum in the Philippines. *The Far Eastern Review*, 595 – 599.

<sup>217</sup> (1947, July 22). New Cebu Well Spurs Hope of Philippines Oil. *New York Herald Tribune*, 8.

<sup>218</sup> Bullis. *Oil in the Philippines*.

<sup>219</sup> Smith. *Coal in the Philippines*.

<sup>220</sup> (1925, January). Gas Producer Power Plant in the Philippines. *The Far Eastern Review*, 45.

<sup>221</sup> *Philippine Coal Supply*.

<sup>222</sup> Smith. *Coal in the Philippines*.

<sup>223</sup> (1925, March). The Manufacturers of the Philippines. *The Far Eastern Review*, (XXI)(3), 135 – 142.

In the electricity sector, private companies played a prominent role<sup>224</sup> since its beginnings, dating back to the late Spanish era. The first centralised electricity in the Philippines was produced by La Electricista, a Spanish-owned company established in 1892 in Calle San Sebastian.<sup>225</sup> Following the departure of the Spanish and the arrival of the Americans, La Electricista was acquired by an American enterprise the Manila Electric Railroad and Light Company, or the Manila Electric Company (Meralco), owned by Charles M. Swift. Meralco represented the single largest American investment in the Philippines,<sup>226</sup> and in the entire East Asia region at that time.<sup>227</sup> It provided the city of Manila with street railway services and electricity generations, using what were purportedly the most modern steam turbine systems in the world.<sup>228</sup>

The private sector was known to utilise thermal power to generate electricity.<sup>229</sup> Based on the type of electricity generation technology available at that time, the thermal source was coal.<sup>230</sup> By 1905, around 200 small boilers and gasoline plants were already in operation throughout Manila.<sup>231</sup> While the private sector dominated the electricity generation, the State played a complementary role<sup>232</sup> at a later stage by establishing the National Power Corporation (NPC) in 1936 through the Commonwealth Act no. 120, with a focus on building hydropower facilities.<sup>233</sup>

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<sup>224</sup> Dohner, R. S., and Intal, Jr., P. (1989). Introduction to “The Marcos Legacy: Economic Policy and Foreign Debt in the Philippines.” In J. D. Sachs and S. M. Collins. (eds.) *Developing Country Debt and Economic Performance, Volume 3: Country Studies - Indonesia, Korea, Philippines, Turkey*, 373 – 400. Retrieved from <https://www.nber.org/system/files/chapters/c9047/c9047.pdf>

<sup>225</sup> Berto. (2022, July 2). *First Power Plant in Manila*. Retrieved from <https://thephilippinestoday.com/first-powerplant-in-manila/>

<sup>226</sup> (1924, July). Manila Electric Company. *The Far-Eastern Review*, (XX)(7), 343 – 346.

<sup>227</sup> Meralco. (n.d.). *History*. Retrieved 2022, September 16, from: <https://company.meralco.com.ph/corporate-profile/history>

<sup>228</sup> (1905, May). Electric Railroad and Light System of Manila. *The Far Eastern Review*, (I)(12), 9 – 18.

<sup>229</sup> Cham, M. R. M. (2007). Philippines Power Sector: Issue and Solutions. *The Philippine Review of Economics*, (XLIV)(1), 33 – 63.

<sup>230</sup> Patel, S., Larson, A., and Harvey A. (2022, October 1). *History of Power: The Evolution of the Electric Generation Industry*. Retrieved from POWER: <https://www.powermag.com/history-of-power-the-evolution-of-the-electric-generation-industry/>

<sup>231</sup> *Electric Railroad and Light System of Manila*.

<sup>232</sup> Shepherd, J. (1941). *Industry in Southeast Asia*. New York: International Secretariat, Institute of Pacific Relations.

<sup>233</sup> National Assembly of the Philippines. (1936). *Commonwealth Act No. 120*. Retrieved from [https://lawphil.net/statutes/comacts/ca1936/ca\\_120\\_1936.html#:~:text=Commonwealth%20Act%20N](https://lawphil.net/statutes/comacts/ca1936/ca_120_1936.html#:~:text=Commonwealth%20Act%20N)

*State relation with the private sector* was characterised by private companies having considerable authority to develop their businesses. This was evident in the rapid expansion of the number of electricity generation plants from 14 in 1918 to 43 in 1924.<sup>234</sup> Besides Meralco, other electric generation companies such as Iloilo Electric Light Company, Visayan Electric Light Company, and Cavite Electric Light Company were in operation.<sup>235</sup> Private power plants operated under franchises and were overseen by the office of the public utility commissioner.<sup>236</sup> During this time, electricity was also generated by rice mills, mines, and sugar factories, although it was primarily for their own use.<sup>237</sup>

In 1925, the American company Associated Gas & Electric Co. (AGECO) acquired Meralco.<sup>238</sup> American influence was significant in the sector as seen in the prevalence of U.S.-manufactured technology and equipment in the Philippine power plants.<sup>239</sup> *State relation with the private sector* experienced a change during Manuel Quezon's presidency (1935-1944) when concerns over American dominance in the energy sector emerged. This was evidenced by the tabling of a public-private partnership concept that aimed at fostering Filipino enterprises,<sup>240</sup> and the revocation of the Vacuum Oil Company's permit in 1936 on the grounds of protecting the Philippines' natural resources from capitalist monopoly.<sup>241</sup> These actions were enabled by the 1935 Constitution, which included provisions in Article XII restricting the disposition, exploitation, development, or utilisation of the country's natural resources to its citizens, or to corporations or associations with at least sixty percent Filipino ownership, and in Article XIII, section 8, which imposed similar

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[o.,120&text=AN%20ACT%20CREATING%20THE%20%22NATIONAL,PUBLIC%20WATERS%20FOR%20ITS%20USE.](https://www.ancr.gov.ph/ancr/act-creating-the-national-public-waters-for-its-use)

<sup>234</sup> *The Manufacturers of the Philippines*.

<sup>235</sup> *Philippine Coal Supply*.

<sup>236</sup> *The Manufacturers of the Philippines*.

<sup>237</sup> McPhelin, M., De La Costa, H., Furay, H. B., and Victoriano, E. (1960, January). Political Transmission 15. *Philippine Studies*, (8)(1), 3 – 50.

<sup>238</sup> Grant, T. (ed.). (2004). Manila Electric Company (Meralco). In *International Directory of Company Histories*, Vol. 56, Detroit, MI: St. James Press, pp 214 – 216.

<sup>239</sup> *The Manufacturers of the Philippines*.

<sup>240</sup> Shepherd. *Industry in Southeast Asia*.

<sup>241</sup> (1936, January 20). Oil Concessions in the Philippines. *The Times*, 19.

requirements for the provision of public utilities.<sup>242</sup> Although these measures did not fundamentally alter the structure of the energy sector given private companies' continued involvement, they nonetheless demonstrated the State's increased power over American companies after the passage of the 1935 Constitution.

In summary, the Philippine early energy sector showed that the development and usage of various energy sources following the discovery of coal and oil mining fields was enabled by the involvement of both the State and private companies. During this era, there was a clear demarcation between what the State and private companies focused on developing: the State was more actively involved in coal and hydropower productions whereas the private companies were more involved in oil production and fossil fuel-based electricity generation. The ownership in developing specific energy sources thus created a complementary *relation between the State and the private sector*, which allowed the latter to expand its business with autonomy, without being guided or dictated by the State. The State empowerment by the 1935 Constitution slightly changed the *State relation with the private sector* by restricting the American influence in the sector, but it did not fundamentally affect the significant role of the private companies and their choices of energy sources. It showed, however, that the State was capable of intervening in the sector when its power grew vis-à-vis the private sector.

### 3.3. Energy Sector in Post-1946 Independence Era (1946 to 1972)

The country gained independence from the American colonial rulers in 1946. The politically significant event presented a potential critical juncture in the energy sector considering American companies' deep involvement in the sector. Emerging from centuries of colonial rule, from the

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<sup>242</sup> Official Gazette. (1935). *The 1935 Constitution*. Retrieved from [https://www.officialgazette.gov.ph/constitutions/the-1935-constitution/#:~:text=\(12\)%20The%20Philippines%20recognizes%20the,all%20military%20forces%20organized%20by](https://www.officialgazette.gov.ph/constitutions/the-1935-constitution/#:~:text=(12)%20The%20Philippines%20recognizes%20the,all%20military%20forces%20organized%20by)

Spanish era in the 16<sup>th</sup> century until the American rule, the newly independent State adopted a strong nationalistic stance in its policies as reflected in the generally restrictive economic policies adopted by presidents Manuel Roxas (1946-1948), Elpidio Quirino (1948-1953), Ramon Magsaysay (1953-1957), Carlos P. Garcia (1957-1961), and Diosdado Macapagal (1961-1965).<sup>243</sup> President Garcia, for example, formulated “Filipino First” policy and encouraged import substitutions among domestic enterprises.<sup>244</sup> The protectionist measures thus could have had serious implications on the American longstanding involvement in the energy sector and significantly transformed the country’s energy sector.

However, despite the country’s determination to assert its autonomy, the transition to independence was fraught with challenges following the World War II. The devastation left by the war made rehabilitation and reconstruction urgent priorities, and the Philippines found itself in need of international assistance. Although restrictive policies aimed to limit foreign involvement were in place, the necessity for aid from foreign donors made it difficult to maintain this stance.

This was particularly evident in the Philippines’ relations with its former colonial ruler, the United States. The United States offered USD620 million to help the Philippines re-construct, among others, its highways, port and harbour facilities, and military and civilian properties.<sup>245</sup> However, this arrangement, formalised in the 1946 Philippine Rehabilitation Act, came with a condition. In exchange for the assistance, the United States demanded the same rights as the Philippine citizens to explore and exploit the country’s natural resources, as well as to provide public utilities.<sup>246</sup> This

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<sup>243</sup> Sicat, G. P. (2011). *The Economic Legacy of Marcos*. UPSE Discussion Paper, No. 2011-11. Quezon City: University of the Philippines. Retrieved from

<https://www.econstor.eu/bitstream/10419/93568/1/672723204.pdf>

<sup>244</sup> Sicat. *The Economic Legacy of Marcos*.

<sup>245</sup> (1946). *Rehabilitation of Philippines*. Act Apr. 30, 1946, Ch. 243, 60 Stat. 128. Retrieved from <https://uscode.house.gov/view.xhtml;jsessionid=2B1014BOAD991E9571F1D98C4AE7ABCB?req=granuleid%3AUSC-1999-title50a-node620&saved=%7CZ3JhbnVsZWlkOlVTQyoxOTk5LXRpdGxlNTBhLW5vZGU2MjAtZnJvbnQ%3D%7C%7C%7Cfalse%7C1999&edition=1999>

<sup>246</sup> Agoncillo, T.A. (1990). *History of the Filipino People*. Quezon City: Garotech Publishing.

condition, called the parity rights, was embedded in the Philippine Trade Act, or the Bell Trade Act, of 1946.<sup>247</sup>

Although the request for parity rights contradicted the terms in the 1935 Constitution, President Roxas responded to such pressure pragmatically. Despite potentially being viewed as a form of neocolonialism, and despite the risk of losing popular support in a nation eager to distance itself from its former colonial ruler, he chose to support the Trade Act. This decision was made to secure a market for the Philippines' exports and forge amicable relations with the United States.<sup>248</sup>

This required an amendment to the 1935 Constitution, and President Roxas needed to secure the approval of three-fourths of the Philippine Congress.<sup>249</sup> To build widespread support, he embarked on a months-long nationwide campaign to promote the benefits of continued American involvements in the Philippine economy. Recognising the importance of the support from the intellectual community, his first major promotional address was strategically delivered at the University of the Philippines on 19 December 1946. The temporary nature of the parity right arrangement was emphasised, along with the prospect of the Philippines becoming stronger and more prosperous with the help of the American capital.<sup>250</sup> After a series of campaigns in the following months, he gave his final speech on the evening of 10 March 1947, just a day before the plebiscite.<sup>251</sup>

President Roxas' leadership and determination to win support was documented in a diplomatic cable by the then U.S. ambassador to the Philippines, Paul McNutt, which stated that President Roxas devoted “*every effort* to secure requisite majority both houses for equal rights amendment

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<sup>247</sup> Golay, F. (1955). Economic Consequences of the Philippine Trade Act. *Pacific Affairs*, (28)(1), 53 – 70.

<sup>248</sup> Shalom, S. R. (1980). Philippine Acceptance of the Bell Trade Act of 1946: A Study of Manipulatory Democracy. *Pacific Historical Review*, (49)(3), 499 – 517.

<sup>249</sup> Shalom. *Philippine Acceptance of the Bell Trade Act of 1946*.

<sup>250</sup> Roxas, M. (1946, November 19). *Address to the Parity Question at the University of the Philippines*. Retrieved September 19, 2022, from <https://www.officialgazette.gov.ph/1946/11/19/address-of-president-roxas-on-the-parity-questions-at-the-university-of-the-philippines-november-19-1946/>

<sup>251</sup> Roxas. *Address to the Parity Question at the University of the Philippines*.

Constitution.”<sup>252</sup> *Every effort* can be interpreted as purposeful machinations, such as offers of patronage and pork barrel funds, to persuade congressmen to vote for the parity amendment.<sup>253</sup> This was also evidenced by the deliberate removal of six elected Communist Huks Congressmen, who opposed the Bell Trade Act, on the grounds of electoral fraud.<sup>254</sup>

The amendment to the 1935 Constitution was eventually passed. The success granted Americans the parity rights and preserved the status quo of the American involvement in the energy sector. This was seen, for example, in the American company the Far East Oil Development Co., Inc., resuming its drilling activities in the Daanbantayan Peninsula in northern Cebu in 1947, following the interruption caused by the Japanese invasion during the World War II.<sup>255</sup>

Against this backdrop, the Philippine independence in 1946 thus presented a near-miss critical juncture that was aborted by the passage of the parity rights. The pressing need for American capital and expertise in oil extraction, among others, was used to justify the amendment of the 1935 Constitution.<sup>256</sup> American involvement was construed as indispensable for the development of the country’s natural resources given that the Philippine government lacked the financial capacity to undertake such efforts on its own.<sup>257</sup> The parity rights thus established a path

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<sup>252</sup> Office of the Historian. (1946). *The Ambassador in the Philippines (McNutt) to the Secretary of State, September 16, 1946*. Foreign Relations of the United States, The Far East, Volume VIII. Retrieved from <https://history.state.gov/historicaldocuments/frus1946v08/d706> ; Italicised for emphasis.

<sup>253</sup> Jimenez, J. V. D. (2020). *Ensuring American Control Over the Philippine Economy through the Imposition of the Parity Rights*. DLSCU Research Congress 2020 “Building Resilient, Innovative, and Sustainable Societies,” June 17-19. Retrieved from <https://www.dlsu.edu.ph/wp-content/uploads/pdf/conferences/research-congress-proceedings/2020/TPH-09.pdf>

<sup>254</sup> Pike, F. (2010). *Empires at War: A Short History of Modern Asia since World War II*. London; New York: I. B. Tauris

<sup>255</sup> *New Cebu Well Spurs Hopes of Philippines Oil*.

<sup>256</sup> Roxas, M. (1954a). Message of His Excellency Manuel Roxas President of the Philippines to the Filipino People Urging Approval of the Parity Amendment to the Constitution at the Plebiscite of March 11, 1947, Released 6 March 1947. In *Papers, Addresses and Other Writings of Manuel Roxas (Vol. 2)*. Manila: Bureau of Printing. Retrieved from <https://www.officialgazette.gov.ph/1947/03/06/message-of-president-roxas-to-the-filipino-people-urging-approval-of-the-parity-amendment-to-the-constitution-at-the-plebiscite-of-march-11-1947-march-6-1947/>

<sup>257</sup> Roxas, M. (1954b). Address of His Excellency Manuel Roxas President of the Philippines on the Parity Amendment to the Constitution (Extracts), Delivered on March 10, 1947. In *Papers, Addresses and Other Writings of Manuel Roxas (Vol. 2)*. Manila: Bureau of Printing. Retrieved from <https://www.officialgazette.gov.ph/1947/03/10/address-of-president-roxas-on-the-parity-amendment-to-the-constitution-extracts/>

dependence on American involvement in the energy sector while re-orienting the power dynamic between the newly independent State and the American-dominated oil sector, arguably granting more power towards the latter.

A path dependence was also evident in energy source investment decisions. Post-independence, the *State continued to be actively involved* in the development of hydropower facilities. In his first State of the Nation Address in 1946, President Roxas called for a nationwide study of hydropower with the vision to further its development.<sup>258</sup> He reiterated this vision in his second address in 1947, emphasising the need to build hydropower plants and restore electricity.<sup>259</sup> In 1952, President Quirino highlighted achievements in hydropower constructions, such as the Lumot Diversion Project, the Maria Cristina Hydroelectric Power and the Ambuklao Hydroelectric Power Projects.<sup>260</sup> During President Magsaysay's term, extensive development of hydropower projects continued, including the completion of a hydroelectric project on the Agno River and the Maria Cristina No.2 Unit in Lanao.<sup>261</sup> Subsequent President Garcia oversaw the completion of the Binga and the Maria Cristina hydropower projects.<sup>262</sup> The State's continuing emphasis on hydropower development was again demonstrated during President Diosdado

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<sup>258</sup> Official Gazette. (1946, June 3). *Message of His Excellency Manuel Roxas President of the Philippines to the Second Congress on the State of the Nation*.

<https://www.officialgazette.gov.ph/1946/06/03/president-roxas-on-first-state-of-the-nation-address-june-3-1946/>

<sup>259</sup> Official Gazette. (1947, January 27). *Message of His Excellency Manuel Roxas President of the Philippines to the First Congress of the Republic during Its Second Session on the State of the Nation*.

Retrieved from <https://www.officialgazette.gov.ph/1947/01/27/manuel-roxas-second-state-of-the-nation-address-january-27-1947/>

<sup>260</sup> Official Gazette. (1952, January 28). *Message of His Excellency Elpidio Quirino President of the Philippines to the Congress on the State of the Nation*. Retrieved from

<https://www.officialgazette.gov.ph/1952/01/28/elpidio-quirino-fourth-state-of-the-nation-address-january-28-1952/>

<sup>261</sup> Official Gazette. (1957, January 28). *Address of His Excellency Ramon Magsaysay President of the Philippines to the Congress on the State of the Nation*. Retrieved from

<https://www.officialgazette.gov.ph/1957/01/28/ramon-magsaysay-fourth-state-of-the-nation-address-january-28-1957/>

<sup>262</sup> Official Gazette. (1960, January 25). *Message of His Excellency Carlos P. Garcia President of the Philippines to the Congress on the State of the Nation*. Retrieved from

<https://www.officialgazette.gov.ph/1960/01/25/carlos-p-garcia-third-state-of-the-nation-address-january-25-1960/>

Macapagal's term. In 1964, the NPC surveyed six areas, investigated thirty-one rivers, planned four large-scale projects, and assessed an additional power potential of 80,000 kilowatts that came mostly from small streams.<sup>263</sup> This continuing focus on hydropower illustrates path dependence in the energy sector.

*State relation with the private sector*, characterised by the growing importance and power of American companies in the oil sector after the passage of the parity rights, also reinforced a path dependence on oil use in the country. In 1954 during President Magsaysay's era, the American company Caltex began operations with a production capacity of 13,000 barrels a day.<sup>264</sup> In 1960, subsequent President Garcia praised the establishment of a favourable investment climate for both domestic and foreign capital to help the country utilise and exploit natural resources, including oil.<sup>265</sup> In 1961, company Pilipinas Shell built the country's second refinery with an initial capacity of 25,000 barrels a day.<sup>266</sup> The close *relation between the State and oil companies* were evident during the inauguration of the Shell Refinery in Barrio Tabangao, Batangas, in 1962. In his speech, President Macapagal emphasised the importance of the oil industry for thermal power plants and lauded the contributions of oil companies in expanding the country's economy.<sup>267</sup> In

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<sup>263</sup> Official Gazette. (1965, January 25). *Message of His Excellency Diosdado Macapagal President of the Philippines to the Congress*. Retrieved from <https://www.officialgazette.gov.ph/1965/01/25/diosdado-macapagal-fourth-state-of-the-nation-address-january-25-1965/>

<sup>264</sup> Peter L. U., Balanquit, R., Garchitorena, G., Jesalva, A. F., and Reyes, P. F. (2021). *Market Study on the Refined Petroleum Industry*. Quezon City: Philippine Competition Commission. Retrieved from <https://www.phcc.gov.ph/wp-content/uploads/2021/04/PCC-Issues-Paper-2021-05-Market-Study-on-the-Refined-Petroleum-Industry.pdf>

<sup>265</sup> Official Gazette. *Message of His Excellency Carlos P. Garcia President of the Philippines to the Congress on the State of the Nation*.

<sup>266</sup> Peter et al. *Market Study on the Refined Petroleum Industry*.

<sup>267</sup> Macapagal, D. (1965). Remarks of His Excellency Diosdado Macapagal President of the Philippines on the Inauguration of the Shell Refinery in Barrio Tabangao, Batangas, Batangas, Delivered in Batangas, July 28, 1962. In *Fullness of Freedom: Speeches and Statements of President Diosdado Macapagal (Vol. IV)*. Manila: Bureau of Printing. Retrieved from <https://mirror.officialgazette.gov.ph/1962/07/28/remarks-of-president-macapagal-on-the-inauguration-of-the-shell-refinery-in-barrio-tabangao-batangas/>

essence, the parity rights and resultant continued American involvement further entrenched the fossil economy and fossil capital expression in the Philippines.<sup>268</sup>

During President Macapagal's tenure, some energy diversification efforts were observed. Unlike the State's traditional focus on hydropower, the Macapagal administration constructed a thermal plant in Limay, Bataan.<sup>269</sup> Additionally, towards the end of his presidency, some development in geothermal technology was initiated. This was seen in the Philippine Commission on Volcanology (COMVOL), currently known as the Philippine Institute of Volcanology and Seismology (PHIVOLCS), surveying Tiwi area for its geothermal potential between 1964 and 1968.<sup>270</sup> COMVOL had been established in 1952 during President Quirino's term to study and monitor volcanic activities following the eruption of Hibok-hibok volcano in 1951.<sup>271</sup> The State's pro-active expansion of into thermal and geothermal energy signaled incremental institutional change, reflecting a layering mechanism,<sup>272</sup> given that other existing arrangements such as the State's involvement in hydropower development continued to remain.

Another observed change was the shift in market share within the electricity sector. By the 1960s, Filipinos owned 18.3 percent of the assets of the 219 electric and power companies in operation, while foreigners, predominantly Americans, owned 82.3 percent, with Meralco maintaining its dominance in the market.<sup>273</sup> Despite the American continuing importance, 20 years of post-

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<sup>268</sup> Interview with Mr Renato Redentor B. Constantino, Executive Director of Institute for Climate and Sustainable Cities (ICSC) based in Manila, 16 January 2023.

<sup>269</sup> Official Gazette. *Message of His Excellency Diosdado Macapagal President of the Philippines to the Congress*.

<sup>270</sup> Gambill, D. T., and Beraquit, D. B. (1993). Development History of the Tiwi Geothermal Field, Philippines. *Geothermics*, (22)(5/6), 403 – 416.

<sup>271</sup> PHIVOLCS (Philippine Institute of Volcanology and Seismology). (n.d.). *PHIVOLCS History*. Retrieved from <https://www.phivolcs.dost.gov.ph/index.php/about-us/history#:~:text=PHIVOLC%20was%20renamed%20Philippine%20Institute,was%20granted%20its%20present%20mandates>

<sup>272</sup> See: Streeck, W. and Thelen, K. (2005). Introduction: Institutional Change in Advanced Political Economies. In W. Streeck and K. Thelen (eds.) *Beyond Continuity: Institutional Change in Advanced Political Economies*, ed., 1–39. Oxford: Oxford University Press, 1 – 39.

<sup>273</sup> McPhelin, et al. *Political Transmission* 15.

independence development had significantly strengthened the economic capacity of some Filipinos and allowed for Filipino capital to begin gaining a foothold in the oil sector.<sup>274</sup>

The increasing importance of Filipino capital in the electricity sector was notably evidenced by Filipino oligarch Eugenio Lopez Sr. leading a group of investors to acquire Meralco from the American owners General Public Utilities (formerly known as AGECO), in January 1962.<sup>275</sup> This made Meralco the first company to be ‘Filipinised.’<sup>276</sup> The involvement of an oligarch in the electricity sector could have altered *the State relation with the private sector* given the patrimonial plunder characteristic of the Philippine politics, which refers to the State being at the service of the oligarchs and cronies most favoured by top leaders, thereby allowing them to accumulate private benefits through political power.<sup>277</sup> The dominance of oligarchs over the State was exemplified by the perception about Eugenio Lopez Sr., the richest man in the Philippines, who was believed to command real power more than any Filipino president ever had.<sup>278</sup> His portrayal in the literature was mixed, however. On one hand, he was considered a ‘benign’ oligarch who amassed power and wealth independently, rather than a crony of a certain administration.<sup>279</sup> On the other hand, he was depicted as someone who controlled the country’s second largest bank, and most notably, the Public Service Commission, and misused its assets for his company’s benefit.<sup>280</sup>

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<sup>274</sup> Macapagal, D. (1965). *Remarks of His Excellency Diosdado Macapagal President of the Philippines on the Inauguration of the Shell Refinery in Barrio Tabangao, Batangas.*

<sup>275</sup> FPH (First Philippine Holdings). *Our History*. Retrieved from <https://www.fphc.com/gettoknow/our-history>

<sup>276</sup> Meralco. (n.d.). *History*. Retrieved 2022, September 16, from: <https://company.meralco.com.ph/corporate-profile/history>

<sup>277</sup> Hutchcroft, P. D. (1991). Oligarchs and Cronies in the Philippine State the Politics of Patrimonial Plunder. *World Politics*, (43)(3), 414 – 450.

<sup>278</sup> Lelyveld, J. (1975, 22 April). *Rich Family Loses Power in Bitter Feud with Marcos*. Retrieved from The New York Times: <https://www.nytimes.com/1975/04/22/archives/rich-family-loses-power-in-bitter-feud-with-marcos.html>

<sup>279</sup> Hutchcroft. *Oligarchs and Cronies in the Philippine State*.

<sup>280</sup> Lelyveld. *Rich Family Loses Power in Bitter Feud with Marcos*.

The complication in *State-private sector relation* arising from the involvement of an oligarch was observed in the problematic transfer of Meralco to Eugenio Lopez Sr. The transfer process allegedly received six months of government support, including permission for the franchise transfer and State finance, which was reflective of rent-seeking practices.<sup>281</sup> The acquisition was finalised just days after President Garcia's term ended on 30 December 1961, but the subsequent President Macapagal denounced the alleged corrupt practice and asked Eugenio Lopez Sr. to step down; however, when the Meralco board denied the request and the government threatened to cancel their license, Lopez brothers fought back and ultimately won the case.<sup>282</sup>

The case illustrated the power imbalance between the State and the oligarchs, which was similar to the dynamic between the State and American companies following the passage of the parity rights. The State's limited influence on Meralco's operations was evident as the company was able to continue to grow its business size after its high-profile handover to the Lopezes. The company built one power plant every eighteen months and successfully expanded the company's generating capacity from 0.3GW to 1.5GW in ten years, and by 1969, Meralco became the largest company in the Philippines, valued at over one billion Philippine Peso (PhP), with its valuation growing to PhP2.8 billion by 1972.<sup>283</sup>

Against this backdrop, it is evident that the Bell Trade Act largely created a path dependence characterised by continued American dominance in the oil and electricity sectors, at least until the takeover of Meralco by Eugenio Lopez Sr. The private sector remained the primary provider of energy-related products and services in the country. As for the State, its continued involvement in the energy sector maintained its focus on building hydropower although institutional change through layering was observed during Macapagal's presidency as the State began to venture into

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<sup>281</sup> McCoy, A. (2015). A Tale of Two Families: Generational Succession in Filipino and American Family Firms. *TRaNS: Trans-Regional and -National Studies of Southeast Asia*, (3)(2), 159 – 190.

<sup>282</sup> McCoy. *A Tale of Two Families: Generational Succession in Filipino and American Family Firms*.

<sup>283</sup> FPH. *Our History*.

thermal power generation and geothermal energy. The passage of the Bell Trade Act also reoriented the power dynamic between the State and American companies and gave more power to the latter by establishing the State's dependence on American companies for oil and electricity provisions.

From the analysis of this period, it is observed, therefore, that the *State involvement* in hydropower sustained its development, and the *State involvement* in energy diversification attempts effectively introduced the use of new energy sources in the energy sector. This shows the agency of the State to catalyse changes, and suggests the importance of State's initiatives in enabling such changes. The analysis during this period also demonstrates that the passage of the Bell Trade Act and the ensuing continued involvement of American oil companies in the Philippine energy sector, and the re-constituting of power dynamics in *the State relation with the American companies*, enforced a path dependence on oil use. Furthermore, a shift from American to Filipino capital in the sector, as exemplified in the case of Meralco, and the ensuing dynamic in *the relation between the State and the company*, had limited effects in effecting changes to the energy sector as the company was still able to retain its autonomy over its business operations and, by extension, its investment decisions on energy sources. This reflects the relative power of the private sector vis-à-vis the State in the energy sector during this period.

### 3.4. Nationalisation of the Energy Sector in Marcos' Martial Law Era (1972 to 1986)

The energy sector experienced a significant jolt during Ferdinand Marcos' presidency due to two major events that occurred almost simultaneously, namely the imposition of the Martial Law in September 1972 and the global oil crisis in 1973. The convergence of these events marked a critical juncture that significantly altered the institutional landscape of the energy sector.

President Ferdinand Marcos succeeded Diosdado Macapagal in December 1965 and inherited an oil sector dominated by foreign companies. By this time, oil had become a key energy source in the Philippines' energy mix, and the country was heavily dependent on low-cost oil imports<sup>284</sup> despite domestic oil production. In 1967, about eleven major oil companies, mostly foreign, which included SE, Filial, Caltex (Philippines), Getty, Mobil, and Pilipinas Shell, operated in the country. By 1972, the majority share of the oil market, was concentrated among three companies, or known as the Big Three, namely Caltex, Bataan Refining Company (later acquired by Petrophil), and Pilipinas Shell, which collectively owned 60 percent of industry assets, thereby giving them the capability to drive up oil prices in the Philippines<sup>285</sup> despite the country's open and competitive oil market characterised by unregulated prices and easy entry and exit for upstream and downstream market participants.<sup>286</sup> This observation further reflected the power of the private companies in the energy sector.

In 1972, against the backdrop of socio-economic and political upheavals, President Marcos imposed the Martial Law. Marcos framed rampant crimes, rebellions and lawlessness, and their presumed links to subversion attempts by the Communist New People's Army, to justify the enactment of the Martial Law.<sup>287</sup> In the name of restoring peace and stability in the country, this measure transformed Marcos into an authoritarian leader. Before finalising the New Philippines' Constitution on 15 January 1973, Marcos used his enhanced power to weaken the influence of the nationalist leftists who were hostile to the U.S. interests by purging them under the guise of

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<sup>284</sup> Montojo, K. (1999). The Political Economy of Philippine Oil Deregulation. *An Interdisciplinary Journal of Southeast Asian Studies*, (13)(1), 65 – 104.

<sup>285</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

<sup>286</sup> Paderanga, A. R. W., and Paderanga, C. W. (1988). The Oil Industry in the Philippines. *Philippine Economic Journal*, 27, 89 – 107.

<sup>287</sup> Van der Kroef, J. M. (1973). Communism and Reform in the Philippines. *Pacific Affairs*, (46)(1), 29 – 58.

combating subversion.<sup>288</sup> The New Philippines' Constitution was the charter that subsequently consolidated his authority and granted him extraordinary powers for indeterminate time.<sup>289</sup>

Such was the domestic political landscape when the global oil crisis hit in 1973. The crisis increased oil prices up nearly five times, from USD2.59 per barrel to USD10.46 per barrel, and caused oil import costs to surge by almost 350 percent, rising from USD187 million in 1973 to USD651 million in 1974.<sup>290</sup> This global oil crisis posed an immediate threat to the Philippine energy security given its reliance on oil imports.

In response to the crisis, President Marcos, with Energy Minister Geronimo Z. Velasco at the helm, implemented aggressive reforms to secure short-term oil supplies and reduce oil import dependence. Most notably, this approach entailed getting *the State directly involved* in the energy sector.<sup>291</sup> This was evidenced by the establishment of the Philippine National Oil Company (PNOC) on 9 November 1973 through Presidential Decree No. 334,<sup>292</sup> with the mandate to secure imported oil supplies and boost domestic oil and gas exploration and production.<sup>293</sup> The State further strengthened its control over the energy sector by creating the Department of Energy through Presidential Decree No. 1206 in 1977<sup>294</sup> and by nationalising the electricity sector.<sup>295</sup>

President Marcos nationalised the Philippine power sector through Presidential Decree No. 40 in 1972, thereby granting state-owned NPC a monopoly on power generation and transmission,<sup>296</sup>

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<sup>288</sup> Durdin, T. (1972, December 25). *Charter Awaited in Philippines*. The New York Times, p. 26. Retrieved from <https://www.nytimes.com/1972/12/25/archives/charter-awaited-in-philippines-us-business-groups-hold-big-stake-in.html>

<sup>289</sup> Durdin. *Charter Awaited in Philippines*.

<sup>290</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

<sup>291</sup> Bensel, T. G., and Harriss, R. C. (1995). Energy Policy and Economic Development in the Philippines, 1973-2000. *The Journal of Energy and Development*, (20)(2), 187 – 227.

<sup>292</sup> PNOC (Philippine National Oil Company). (n.d). *PNOC Profile*. Retrieved from [https://www.pnoc.com.ph/?page\\_id=1813](https://www.pnoc.com.ph/?page_id=1813)

<sup>293</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

<sup>294</sup> DOE. (n.d.b.). *History*. Retrieved from <https://www.doe.gov.ph/who-we-are>

<sup>295</sup> Saculsan and Mori. *Why Developing Countries Go through an Unsustainable Energy Transition Pathway?*

<sup>296</sup> Cham. *Philippine Power Sector*.

and effectively forcing private companies to sell their electricity-generating facilities to the NPC.<sup>297</sup> A senior staff member from Aboitiz Power Corporation confirmed that the company's operations were disrupted during the Marcos era.<sup>298</sup> Meralco faced a similar fate. Despite Eugenio Lopez Sr.'s close ties with President Marcos during the first six years of his presidency, Meralco was also appropriated from the Lopezes<sup>299</sup> and its operations were transferred to the NPC.

It is evident, therefore, that the global oil crisis served as a critical juncture that led to major institutional changes in the Philippine energy sector. Not only had it resulted in the *State's deepening involvement* in the energy sector, but it had also fundamentally transformed the *relation between the State and the private sector*, shifting the power balance initially skewed towards private companies to one where the State exerted absolute control.

The transfer of the energy sector to the State subjected the sector to State's strategic interests and priorities. An example of State's strategic measure at reducing oil import dependence was in the Marcos administration's decision to allow foreign companies to continue their operations in the oil sector, in view of the country's continuing needs for foreign investments for oil exploration purposes. The Oil Exploration and Development Act of 1972, which stipulated contractual terms and fiscal incentive that were especially favourable to offshore exploration, was a pivotal regulatory intervention. This strategy proved successful as evidenced by the discoveries of a relatively large field in offshore Northwest Palawan in 1989 by Occidental Philippines (Oxy), the West Linacapan field in 1990 by Alcorn Philippines, and the Malampaya gas field in 1991 by Shell Philippine Exploration B. V. and Oxy.<sup>300</sup> The effectiveness of the service contract system

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<sup>297</sup> Saculsan and Mori. *Why Developing Countries Go through an Unsustainable Energy Transition Pathway?*

<sup>298</sup> Interview with a senior staff from Aboitiz Power Corporation based in Manila, 10 January 2023.

<sup>299</sup> McCoy. *A Tale of Two Families: Generational Succession in Filipino and American Family Firms*.

<sup>300</sup> DOE. *History*.

introduced by this law was reflected in the oil production volumes, which exceeded what the Philippines had produced since oil exploration began in the late 19th century.<sup>301</sup>

Another strategic intervention by the State in response to the global oil crisis was the regulating of oil prices in the 1980s and the introduction of progressive taxes for different fuel categories.<sup>302</sup>

Private companies reacted differently to the State's increasing interventions. Some companies, such as Exxon Corp and Gulf, decided to leave the Philippines because the regulated selling oil price was deemed too low.<sup>303</sup> Some others, like the Big Three companies Petrophil, Pilipinas Shell, and Caltex, sought to counter-balance the State's growing power in the energy sector. The Big Three, who had further consolidated their dominance by acquiring many other oil companies by 1985, leveraged their economic clout and lobbied the government to grant them incentives and beneficial terms, a process facilitated by Pilipinas Shell president Cesar Buenaventura's position on the Philippine Central Bank's Monetary Board as an industrial representative in the early 1980s, where he was involved in the formulation of favourable Forward Cover policy that guaranteed oil suppliers reimbursement for losses from depreciating Philippine peso; these counter-measures implemented by the oil giants proved effective, as demonstrated by other favourable policies, such as the Consumer Price Equalization Fund (CPEF) being introduced in the early 1980s to compensate oil companies for the additional costs incurred from OPEC oil sources, and the Oil Price Stabilization Fund (OPSF) being established by Presidential Decree 1956 on 15 October 1984, which served as a safety net for oil companies against exchange rate fluctuations.<sup>304</sup>

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<sup>301</sup> Reyes, M. V. (1997). *Philippine Petroleum Industry*. Paper presented during the S and T Centennial Celebration, Symposium on Energy, 23 Oct 1997, Dusit Hotel Nikko, Makati City, the Philippines.

Retrieved from [https://inis.iaea.org/collection/NCLCollectionStore/\\_Public/29/036/29036439.pdf](https://inis.iaea.org/collection/NCLCollectionStore/_Public/29/036/29036439.pdf)

<sup>302</sup> Hoffman, S. (1988). *Philippines Asia Pacific Energy Series Country Report*. Honolulu, Hawaii: East-West Center.

<sup>303</sup> Rupert, J. (1986, March 29). *Manila Probes Oil Czar's Deals*. Retrieved from The Washington Post: <https://www.washingtonpost.com/archive/politics/1986/03/29/manila-probes-oil-czars-deals/2181a134-15f7-4f35-84ff-ec07c89ee305/>

<sup>304</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

It is evident, therefore, that the power *relation between the State and the foreign oil companies* during the Marcos era significantly influenced energy policies. It also reflected the State's strategic calculations considering that, despite its powerful control of the sector, the State had to accommodate foreign oil companies' demands due to its dependence on them. The State benefited from public revenue generated by their operations and relied on their technical support as evidenced, for example, by Pilipinas Shell and Caltex providing technical expertise to the newly established PNOC.<sup>305</sup> Maintaining good relationships with foreign oil companies was thus critical for the Philippines to secure long-term oil supply contracts, which were essential for Marcos' political stability, given that all economies at that time were dependent on oil.<sup>306</sup>

The strategic influence of the State was also evident in its pursuit of energy diversification agenda to lessen the country's dependence on oil imports. First, the Marcos administration capitalised on the development of geothermal energy, which had begun before the 1973 global oil crisis. Earlier in 1967, the development of geothermal energy gained legal certainty through the enactment of Republic Act No. 5092 or the Geothermal Energy, Natural Gas and Methane Gas Law.<sup>307</sup> Facilitated by the energy diversification push during the Marcos era, the Law proved highly successful as evident in geothermal energy growing from practically nothing in 1973 to about 8.5 percent of the Philippine energy mix in 1985, making the country the second-largest geothermal producer in the world after the United States, while the State's strategic arrangement to ensure the project's financial viability was evidenced by the bulk purchase of production from the largest geothermal developer, PNOC Energy Development Corporation, by state-owned NPC.<sup>308</sup>

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<sup>305</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

<sup>306</sup> Constantino, R. R. B. Interview. 2023.

<sup>307</sup> Senate and House of Representatives of the Philippines in Congress. (1967, June 17). *Republic Act No. 5092: An Act to Promote and Regulate the Exploration, Development, Exploitation and Utilization of Geothermal Energy, Natural Gas and Methane Gas; to Encourage its Conservation; and for Other Purposes*.

<sup>308</sup> Bense and Harriss. *Energy Policy and Economic Development in the Philippines*.

Second, the State enacted the Coal Development Act in 1976 and strategically designated its use for electricity generation and cement industry to boost its production. This measure was taken despite domestic coal's low-quality problems which were already observed even during the colonial era. An official from the Philippine Department of Energy confirmed that the Coal Development Act of 1976 compelled the government to actively pursue the exploration, development, and exploitation of indigenous energy resources including coal, as it was identified as a fossil fuel known to exist in mineable quantities and deemed viable for some vital industries.<sup>309</sup> It was further confirmed that the market for domestic coal was purposely created by granting some incentives to prospective users to convert their facilities to utilise coal.<sup>310</sup> Moreover, supporting policy was designed to favour domestic coal by imposing tariff on imported coal and mandating consumers to buy at least half of their coal use from local producers, and the National Coal Authority was established to ease coal purchase among domestic producers, and develop the necessary infrastructure and logistics for fuel switch and increased coal use, especially in the electricity sector and the cement industry; additionally, the State further incentivised the cement industry to increase coal usage by providing tax-free imports of necessary equipment, low-interest loans for equipment purchases, and attractive prices for domestic coal, resulting in the successful increase of domestic coal's market share from 0.2 percent in 1973 to 4.8 percent in 1985, despite challenges posed by low production volumes and quality issues.<sup>311</sup>

The *State's deepening involvement in the energy sector* witnessed the allocation of about 30 to 40 percent of all public sector spending in the said sector by the early 1980s, and the passage of nearly 100 energy-related laws between 1973 and 1985.<sup>312</sup> These laws were instrumental in implementing strategic decision-making in response to the global oil crisis,<sup>313</sup> which included the

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<sup>309</sup> Interview with an official from the Philippine Department of Energy based in Manila, 26 January 2023.

<sup>310</sup> The Philippine Department of Energy official. Interview. 2023.

<sup>311</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

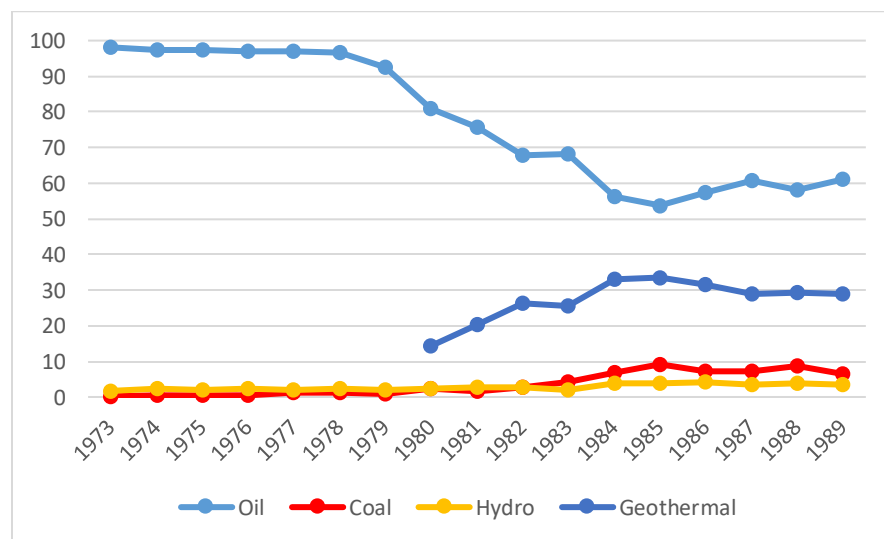
<sup>312</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

<sup>313</sup> Constantino, R. R. B. Interview. 2023.

passage of energy conservation law to manage energy demand.<sup>314</sup> The success in boosting domestic production and reducing import share was evident, with the share of domestic energy sources increasing from 8 percent in 1973 to 45 percent in 1985, and the share of imported oil decreasing from 92 percent in 1973 to 50 percent in 1985.<sup>315</sup> The shift of power towards the State was a critical factor in enabling meaningful policy reforms, which had been difficult to achieve in the preceding era due to the influence of oligarchs who often resisted government initiatives.<sup>316</sup>

The implementation of energy policies during this period can be illustrated by the trend of primary energy supply mix shown in Figure 3.1. It clearly shows the success of Marcos-era interventions, as seen in oil share starting to decline in the late 1970s while the shares of geothermal and coal beginning to rise in the early 1980s.

**Figure 3. 1: The Philippine Primary Energy Supply Mix, 1973 to 1989 (in %)**



Source: APEC Energy Working Group - Expert Group on Energy Data and Analysis (EGED). (n.d.). *Primary Energy Supply Table*. Retrieved from [https://www.egeda.ewg.apec.org/egeda/database\\_info/newprimary\\_select\\_form.html](https://www.egeda.ewg.apec.org/egeda/database_info/newprimary_select_form.html)

<sup>314</sup> Interview with Mr Artemio P. Habitan, Director III of the Energy Utilization Management Bureau (EUMB) of the Philippine Department of Energy, in Manila, 13 January 2023.

<sup>315</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

<sup>316</sup> Sicat. *The Economic Legacy of Marcos*.

The electricity sector likewise witnessed increased State involvement, most notably with the construction of the country's first Bataan nuclear power plant (BNPP) among the twenty new power plants built between 1965 and 1986.<sup>317</sup> The successful completion of the 621MW BNPP that was constructed between 1976 and 1985<sup>318</sup> demonstrated the country's adherence to the international safety standards and regulations outlined by the International Atomic Energy Agency (IAEA) and its effective engagement with the American company Westinghouse as the technology provider although the original plan to build two plants, namely the Philippine Nuclear Power Plant One (later renamed BNPP) and the Philippine Nuclear Power Plant Two,<sup>319</sup> was eventually derailed by controversies surrounding corruption and cronyism linked to President Marcos.<sup>320</sup>

Marcos' cronies who were implicated in corruption charges included energy minister Velasco, with a USD123 million of government-assumed loan associated with the PNOC; businessman Herminio Disini, with a USD795 million of government-assumed loan linked to the NPC, and Marcos' brother-in-law Benjamin Romualdez with a USD370 million of government-assumed loan related to Meralco.<sup>321</sup> Velasco's corrupt practices at the PNOC were exceedingly extensive that the company was dubbed the fattest milk cow of the Marcos era.<sup>322</sup> Corruption was found not only in state-own enterprises but also in the private sector as reported in Pilipinas Shell's engaging

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<sup>317</sup> Arillo, C. (2015, October 30). *Marcos's Unmatched Legacy: Energy*. Retrieved from Business Mirror: <https://businessmirror.com.ph/2015/10/30/marccoss-unmatched-legacy-energy/>

<sup>318</sup> National Power Corporation. (n.d.). *The National Power Corporation and the BNPP Experience: A Presentation for the BNPP Visitors/Guest*. Retrieved from [https://drive.google.com/file/d/1HPEIROo55\\_LkLn74BnKNrhD146zqKD7c/view](https://drive.google.com/file/d/1HPEIROo55_LkLn74BnKNrhD146zqKD7c/view)

<sup>319</sup> Interview with Mr Dante M. Caraos, the current plant manager of the Bataan Nuclear Power Plant, based in Bataan, 19 January 2023.

<sup>320</sup> Beaver, W. (1994). Nuclear Nightmares in the Philippines. *Journal of Business Ethics*, (13)(4), 271 – 279.

<sup>321</sup> IBON. (2004, September). *Repudiation of Marcos's Illegitimate Debts: A Pro-People Measure to Address the Fiscal Crisis*. IBON Policy Paper. Manila: Ibon Foundation Inc. Retrieved from <https://www.bulatlat.com/news/4-40/4-40-Marcosdebts.pdf>

<sup>322</sup> Rupert. *Manila Probes Oil Czar's Deals*.

in stock manipulation.<sup>323</sup> These corrupt practices were part of the reasons behind the decline in the number of oil companies operating in the country, reducing them to just ten by 1972.<sup>324</sup>

At this juncture, it is evident that the combination of the enactment of the Martial Law in 1972 and the global oil crisis in 1973 served as a critical juncture that led to a radical transformation in the Philippine energy sector. This resulted in greater *State involvement and authority within the sector*, significantly altering *its relationship with the private sector*, and influencing the country's energy source choices. The new arrangements brought about by the critical juncture had the potential to turn into a path dependence. It turned out to be short-lived, however, as the politically tumultuous events that led to Marcos' downfall introduced yet another critical juncture in the country's energy sector.

### 3.5. Re-Privatisation Initiatives Post-Marcos Era (1986 to 2001)

Marcos' authoritarian regime ended in 1986 following the People Power Revolution, during which hundreds of thousands of Filipinos demonstrated on the streets of Manila over the course of a week.<sup>325</sup> Due to widespread acrimony and dissatisfaction with his corrupt leadership, the subsequent administration under President Corazon Aquino prioritised bureaucratic reform, including in the energy sector, at the top of its political agenda.

The Aquino administration made deliberate attempts to reverse some of the measures introduced during the Marcos era. For example, the running of the economy was shifted back to the private sector with the State adopting a more supporting role. This shift marked a significant

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<sup>323</sup> Aquino, B. (1987). *Politics of Plunder: The Philippines under Marcos*. Quezon City: Great Books Trading.

<sup>324</sup> Paderanga and Paderanga. *The Oil Industry in the Philippines*.

<sup>325</sup> Ileteo, R. C. (1993). The 'Unfinished Revolution' in Philippine Political Discourse. *Southeast Asia Studies*, (31)(1), 62 – 82.

development, as it set the stage for another critical juncture in the Philippine energy sector that profoundly changed *State involvement in the sector and its relationship with the private sector*.

To begin the transfer to the private sector, the Aquino administration set in motion the privatisation of 122 state-owned enterprises, with 85 being put up for sale and 71 successfully privatised by June 1992, including notable entities such as Meralco, the Philippine Airlines, Nonoc Mining and Industrial Corporation, PNB, Marina Properties, Inc., Philippine Plaza Holdings, Inc., and Union Bank of the Philippines.<sup>326</sup> In a move to restore Meralco to its original owners, President Aquino appointed Eugenio Lopez Sr.'s fourth child Manuel M. Lopez as the officer-in-charge of Meralco, and Eugenio Sr.'s second son Oscar Lopez as the president of Meralco's holding company First Philippine Holdings.<sup>327</sup>

To further restore State legitimacy, the Aquino administration distanced itself from the Big Three oil companies. Recognising that their relationship with the State no longer benefited them as much, as evidenced by reduced forward cover protection and unpaid OPSF reimbursements, the private companies called for the deregulation of the oil sector, with Pilipinas Shell being the first one to do so.<sup>328</sup>

In addition, to tackle corruption cases within energy enterprises, the Aquino administration dismantled the Department of Energy, and mothballed the BNPP and six other non-nuclear power projects.<sup>329</sup>

While these reversal measures aimed to address the issues of the Marcos era, the performance in the energy sector unexpectedly suffered due to neglect,<sup>330</sup> leading to severe electricity shortages

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<sup>326</sup> Cortes, R. M. (1999). Leading in the Name of the People: Corazon Cojuangco Aquino presidency (1986-1992). In R. M. Cortes. (ed.) *Philippine Presidents 100 Years*. Quezon City: The Philippine Historical Association, 250 – 283.

<sup>327</sup> McCoy. *A Tale of Two Families*.

<sup>328</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

<sup>329</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

<sup>330</sup> Habitan, A. P. Interview. 2023.

and daily blackouts ranging from 6 to 16 hours in various parts of the country.<sup>331</sup> This crisis was attributed to Aquino's ineffective management of the sector and the NPC's inability to operate efficiently owing to its operational and financial problems<sup>332</sup> and a high turnover rate among its technical and managerial personnel.<sup>333</sup> The rapid economic growth post-Marcos era spurred increased electricity demand, and necessitated the building of new generation, transmission and distribution capacity<sup>334</sup> which the NPC alone was not capable of performing.

Aside from governance problems, the power shortage was exacerbated by multiple issues affecting geothermal, hydroelectric and coal-fired power plants. These included the difficulty in expanding geothermal capacity given the remote locations of the geothermal fields, some unfavourable terms in the geothermal law, drought in 1989 that affected hydropower outputs, and a string of coal power plant breakdowns, including at Cebu's Naga plant due to typhoon damages.<sup>335</sup>

This situation painted a perception of government incompetence in managing the electricity sector and supported re-privatisation measures as a remedy for the government's shortcomings in providing public goods. In response to the electricity crisis, the Aquino administration issued Executive Order (EO) 215 in 1987, which lifted the NPC's monopoly on the electricity sector and allowed private sector participation. This marked a significant reversal of the State control established during the Marcos era.

The EO 215 was implemented in mid-1989 and led to the construction of the first commercial private 210MW diesel-fired gas turbine by 1991.<sup>336</sup> To further reinforce the role of the private

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<sup>331</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

<sup>332</sup> Cham. *Philippine Power Sector*.

<sup>333</sup> Tabbada, J.P. (1997). The Role of the Board of the National Power Corporation of the Philippines. *Asian Journal of Public Administration*, (19)(1), 71 – 85.

<sup>334</sup> Cham. *Philippine Power Sector*.

<sup>335</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

<sup>336</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

sector, Republic Act No. 6957 was signed on 9 July 1990 to facilitate private company involvement in the financing, construction, operation, and maintenance of infrastructures.<sup>337</sup>

While the Philippine re-privatisation initiatives were considered among the most well-designed programmes in the developing countries at the time,<sup>338</sup> their effects did not push through fast enough. Electricity demand outpaced generating capacity, and subsequently slid into an economic crisis<sup>339</sup> as the supply proved insufficient to support economic and industrial activities. The electricity shortage was not the sole cause of the economic downturn given that the Aquino administration also struggled to secure adequate funding to finance new infrastructure projects necessary to support economic growth, and such situation had compelled her administration to seek loans from the International Monetary Fund (IMF).<sup>340</sup>

Despite grappling with electricity and economic challenges, the Aquino administration made efforts to participate in the global environmental processes. This was evident in the adoption of sustainable development principles within the Philippine Strategy for Sustainable Development (PSSD) in 1989.<sup>341</sup> The PSSD, which outlined 10 strategies for sustainable development, and the establishment of the Inter Agency Committee on Climate Change (IACCC) in 1991, were a direct response to global discussions on climate change initiated by the World Meteorological Organization and the United Nations Environmental Programs.

The IACCC, chaired by the Secretary of the Department of Environment and Natural Resources, was tasked with formulating climate-related policies and strategies and preparing the Philippines

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<sup>337</sup> Senate and House of Representatives of the Philippines in Congress. (1990, July 9). *Republic Act No. 6957: An Act Authorizing the Financing, Construction, Operation and Maintenance of Infrastructure Projects by the Private Sector, and for Other Purposes*. Retrieved from <https://www.officialgazette.gov.ph/1990/07/09/republic-act-no-6957/>

<sup>338</sup> Bensel and Harriss. *Energy Policy and Economic Development in the Philippines*.

<sup>339</sup> Cham. *Philippine Power Sector*.

<sup>340</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

<sup>341</sup> The Republic of the Philippines. (n.d.). *Second National Communication to the United Nations Framework Convention on Climate Change*. Retrieved on August 30, 2024, from <https://unfccc.int/resource/docs/natc/phlnc2.pdf>

for the 1992 UN Conference for Environment and Development held in Brazil.<sup>342</sup> The establishment of the IACCC demonstrates the State's early proactive engagement with global environmental norms and its efforts to align national policies with global environmental goals. Although the energy sector was not yet the focus of climate action at this point, the State participation and President Aquino's responsiveness to the global climate agenda served as an entry point for the energy sector's eventual exposure to climate mitigation measures and the effects on the country's energy choices.

By 1990, the Aquino administration acknowledged that massive poverty and structural problems hindering economic growth were the primary drivers of the political instability of the time.<sup>343</sup> The electricity shortage and the broader poor economic performance decreased Aquino's popularity and ultimately led to her downfall in 1992.<sup>344</sup>

At this point, considering the energy sector's susceptibility to significant institutional changes following changes in top leadership, the fall of Aquino presented another potential critical juncture for the sector. Aquino was succeeded by President Fidel Ramos in 1992. As part of the efforts to address the electricity crisis that he inherited, the Ramos administration re-instated the Department of Energy through the Republic Act No. 7638 on 9 December 1992.<sup>345</sup> In addition, this Act assigned the Energy Resource Development Bureau to assist in the formulation and implementation of policies that were aimed to develop and increase the supply from local energy resources like fossil fuels, nuclear fuels, and geothermal resources.

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<sup>342</sup> The President of the Philippines. (1991, May 8). *Administrative Order No. 220: Creating an Inter-Agency Committee on Climate Change*. Retrieved on August 30, 2024, from [https://lawphil.net/executive/ao/ao1991/ao\\_220\\_1991.html](https://lawphil.net/executive/ao/ao1991/ao_220_1991.html)

<sup>343</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

<sup>344</sup> Cortes, R. M. (1999). Leading in the Name of the People: Corazon Cojuangco Aquino presidency (1986-1992). In R. M. Cortes. (ed.) *Philippine Presidents 100 Years*. Quezon City: The Philippine Historical Association, 250 – 283.

<sup>345</sup> Official Gazette. (1992, December 9). *Republic Act No. 7638: An Act Creating the Department of Energy, Rationalizing the Organization and Functions of Government Agencies Related to Energy, and for Other Purposes*. Retrieved from <https://www.officialgazette.gov.ph/1992/12/09/republic-act-no-7638/>

Although the passage of the Act strengthened *State involvement in the sector*, it did not lead to a critical juncture, but instead constituted layering, because it neither stop nor disrupt ongoing privatisation processes. In the oil industry, the State through the Department of Energy was given a supervisory and regulatory role. It was also granted the authority to draw up plans to cope with contingencies of energy supply interruptions and to assist in the formulation and implementation of financial and fiscal policies, rules, guidelines, and requirements for the operations of entities involved in the supply of energy resources. These entities included, among others, oil companies, petroleum product dealers, coal importing and distributing companies, natural gas distribution entities, and independent power producers.

After the re-instatement of the Department of Energy, the Ramos administration oversaw the passage of additional laws and regulations that further empowered the *State involvement in the energy sector*. The 1998 Downstream Oil Deregulation Act granted the government the authority to intervene in the oil market by monitoring the relationships between the oil companies (refiners and importers) and their dealers, haulers, and Liquefied Petroleum Gas (LPG) distributors, ensuring fair and equitable practices, and enforcing existing contracts. Section 8 of the 1998 Act also tasked the Department of Energy, the Department of Foreign Affairs, and the Department of Trade and Industry, to jointly formulate and establish a program that promoted the entry of new participants in the industry. The State was further empowered to address the power crisis urgently through the Republic Act 7648 signed in 1993.<sup>346</sup>

Despite the *State deepening involvement in the energy sector*, the Republic Act 7718 was signed in 1994 to emphasise the role of the private sector in the economy and provide incentives to

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<sup>346</sup> Official Gazette. (1993, April 5). *Republic Act No. 7648: An Act Prescribing Urgent Related Measures Necessary and Proper to Effectively Address the Electric Power Crisis and for Other Purposes*. Retrieved from <https://www.officialgazette.gov.ph/1993/04/05/republic-act-no-7648/>

private companies involved in infrastructure projects, including the building of power plants.<sup>347</sup> Foreign investors were also allowed to enter the electricity sector to meet energy needs. Additionally, the privatisation of other sectors such as transportation, telecommunications, property, mineral exploration and infrastructure was underway to address the broader economic challenges facing the country.<sup>348</sup> At this juncture, it is evident that the Ramos administration sought to balance the power *relation between the State and the private sector* while continuing Aquino's "New Economics Program" liberalisation initiatives.<sup>349</sup> In the power generation industry, liberalisation measures were evident in the introduction of competitiveness and the requirement for electricity distributors to plan and find their own suppliers.<sup>350</sup>

Privatisation also impacted the oil sector. The call for oil deregulation that was initiated by the private sector during Aquino's presidency was realised through the enactment of the Downstream Oil Deregulation Act (RA 8180) in 1996, and was further refined and finalised in the Downstream Oil Industry Deregulation Act of 1998 (RA 8479).<sup>351</sup> The IMF played a role in pushing the deregulation reform by making it a requirement for the Philippines to qualify for the IMF Extended Fund Facility (EFF) programme in 1994, prompting the Ramos administration to enact deregulation just before the IMF panel review was due in March 1997.<sup>352</sup> This liberalisation led to the entry of new players into an oil industry that was previously dominated by the Big Three (Petron Corporation, Pilipinas Shell and Caltex Philippines).<sup>353</sup>

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<sup>347</sup> Official Gazette. (1994, May 5). *Republic Act No. 7718: An Act Amending Certain Sections of Republic Act No. 6957, Entitled "An Act Authorizing the Financing, Construction, Operation and Maintenance of Infrastructure Projects by the Private Sector, and for Other Purposes."* Retrieved from <https://www.officialgazette.gov.ph/1994/05/05/republic-act-no-7718/>

<sup>348</sup> Cortes, R. M. (1999). "Tiger" Statesman FIDEL VALDEZ RAMOS (1992-1998). In R. M. Cortes. (ed.) *Philippine Presidents 100 Years*. Quezon City: The Philippine Historical Association, 284 – 333.

<sup>349</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

<sup>350</sup> Cortes. "Tiger" Statesman FIDEL VALDEZ RAMOS (1992-1998).

<sup>351</sup> Official Gazette. *Republic Act No. 7638: An Act Creating the Department of Energy, Rationalizing the Organization and Functions of Government Agencies Related to Energy, and for Other Purposes*.

<sup>352</sup> Montojo. *The Political Economy of Philippine Oil Deregulation*.

<sup>353</sup> Peter et al. *Market Study on the Refined Petroleum Industry*.

Market liberalisation and the simultaneous strengthening of *State involvement in the energy sector* were not the only initiatives taken by the Ramos administration. To address the power crisis, multiple projects were launched, including the Leyte-Cebu Interconnection Project, the Leyte-Luzon High Voltage Direct Current Interconnection project, and rural electrification scheme, while also pursuing energy diversification through the development of new and renewable energy source such as ocean, solar, and wind power, which were first mentioned during Ramos' presidency.<sup>354</sup>

Moreover, despite the mothballing of the BNPP in the previous administration in 1986, nuclear fuels were included in the 1992 Republic Act No. 7638. This indicated that the Philippine government did not entirely rule out the potential use of nuclear source for electricity generation as part of its energy diversification efforts. Indeed, since the mothballing, the nuclear facility has received some budget allocations to ensure the basic maintenance of adequate water and power supply and to secure the facility for safety purposes.<sup>355</sup>

In terms of response to the global sustainable development agenda, President Ramos continued the initiatives started by Aquino and incorporated them into his Five Priority Programs, leveraging his power to establish the Philippine Council for Sustainable Development through Executive Order No. 15,<sup>356</sup> which was signed less than three months after the 1992 United Nations Conference on Environment and Development (the Earth Summit) was held. Additionally, the Philippines ratified the 1992 UNFCCC on 2 August 1994.<sup>357</sup>

The alignment with the global sustainable development agenda was further evidenced by the hosting of the Asia Pacific Economic Cooperation (APEC) Senior Officials and Ministerial Meetings on Sustainable Development in June 1996 and the subsequent establishment of the

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<sup>354</sup> Cortes. *"Tiger" Statesman*.

<sup>355</sup> Caraos, D. M. Interview. 2023.

<sup>356</sup> Office of the President of the Philippines. *Executive Order No. 15*.

<sup>357</sup> The Republic of the Philippines. *Second National Communication to the United Nations Framework Convention on Climate Change*.

Environment and Natural Resources Accounting.<sup>358</sup> The commitment to the agenda was also reflected in the drafting of the National Action Plan on Climate Change the following year.<sup>359</sup> The State's responsiveness to international processes and its formal adoption of the sustainability agenda, along with the creation of dedicated institutions, demonstrated a path dependence along sustainable development agenda which began under Aquino's presidency.

At this juncture, it is evident that the leadership transition from Aquino to Ramos did not result in a critical juncture in the energy sector. Instead, Ramos reinforced a path dependence along privatisation measures, and combined it with the *State deepening involvement in the sector*, primarily in the supervisory and regulatory capacity. This was arguably to establish a better balance in *the State relation with the private sector*. Under Ramos' presidency, the privatisation measures progressed significantly, transforming the electricity sector from a state-controlled monopoly to a system where state-owned NPC acted as the sole buyer of electricity from independent power producers, and ultimately to a market where the private sector could sell electricity directly to distributors and major industries.<sup>360</sup> At the same time, the *State involvement in the sector* was able to give a stronger push for energy diversification efforts, widening the country's energy choices to cover newer forms of energy sources like ocean, solar and wind. The State thus consciously led the pathway to the adoption of newer types of energy sources, and along with its participation in and active responses to the global climate processes that had begun since Aquino's presidency, thus set the stage for a change in the country's energy choices.

The implementation of energy policies in this era is illustrated in the trend of the primary energy supply mix reflected in Figure 3.2. The figure notably shows a general increase in the shares of geothermal and coal in the late 1990s, a decline in oil share beginning from the early 2000s, and

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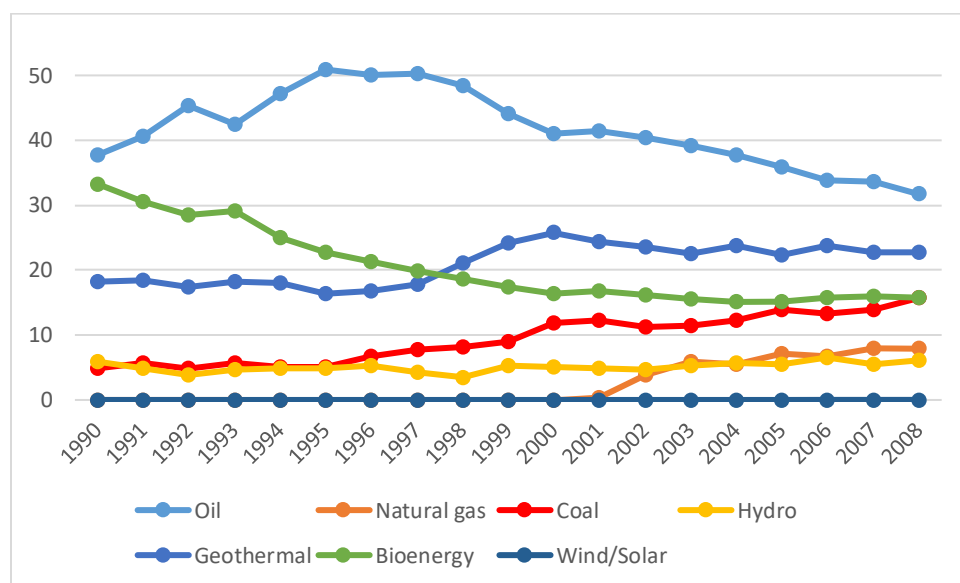
<sup>358</sup> Cortes. "Tiger" Statesman.

<sup>359</sup> The Republic of the Philippines. *Second National Communication to the United Nations Framework Convention on Climate Change*.

<sup>360</sup> Aldaba, R. M. (2004). Regulatory Policies and Reforms in the Power and Downstream Oil Industries. *Philippine Journal of Development*, (XXXI)(57), 65 – 106.

the start of natural gas use since 2001. Coal played an important role in replacing oil, with its share rising from the mid-1990s to the late 2000s, concurrent with oil's declining share. Figure 3.2. thus demonstrates that the institutional changes that happened in the post-Marcos era did not fundamentally affect the country's energy choices as evidenced by the continuing energy diversification efforts, reflected in the increased shares of non-oil energy sources.

**Figure 3. 2: The Philippine Primary Energy Supply Mix, 1990 to 2008 (in %)**



Source: DOE. (n.d.e.) *Primary Energy Supply Mix*. Retrieved on August 30, 2024, from [https://doe.gov.ph/sites/default/files/pdf/energy\\_statistics/1990-2018\\_kes-primary\\_energy.pdf](https://doe.gov.ph/sites/default/files/pdf/energy_statistics/1990-2018_kes-primary_energy.pdf)

### 3.6. Renewable Energy Development Era (2001 to 2024)

Such was the energy sector trajectory that subsequent President Joseph Estrada and his Vice President Gloria Macapagal-Arroyo inherited when they ascended to the country's top leadership in 1998. Estrada's presidency was short lived and ended in January 2001 due to impeachment following corruption charges. Macapagal-Arroyo became president to replace Estrada in 2001, and won the subsequent presidential election in 2004. Her rise to power occurred against the backdrop of the political and economic instability left by Estrada, and the Asian financial crisis that affected the Philippines and the rest of its neighbouring countries in 1997-1998.

The convergence of leadership changes and the multiple crises affecting the country had the potential to drive institutional change in the energy sector. However, the path dependence along privatisation efforts proved durable. This was partly because the State was perceived responsible for the multiple crises, owing to its ineffective management and poor performance in providing public goods. For example, the Asian financial crisis exposed state-owned NPC's heavy reliance on foreign loans and its net loss of PhP 3.6 billion in 1998.<sup>361</sup> Confronted with these financial troubles, the State opted to completely restructure and reform the electricity sector<sup>362</sup> through privatisation, rather than tightening its control over the ailing enterprise. The privatisation initiative did not only come from the State, however. Multilateral institutions like the World Bank, the IMF, and the Asian Development Bank (ADB), which had assisted the Philippine government in solving the power crisis through loans, grants advice and technical expertise, advocated for privatisation, thereby exacting pressure on the State to continue this trajectory.<sup>363</sup>

The decade-long incremental changes along the privatisation pathway in the Philippine electricity industry culminated in the passage of the Electric Power Industry Reform Act (EPIRA) on 8 June 2001.<sup>364</sup> The EPIRA was viewed as a crucial intervention to address the financial difficulties that had plagued the NPC.<sup>365</sup> This led to the layoff of approximately 11,700 NPC employees, the segregation and privatisation of the NPC's generation and transmission assets, and the

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<sup>361</sup> World Bank. (2000). *Private Solutions for Infrastructure: Opportunities for the Philippines*. Washington, D.C.: The World Bank.

<sup>362</sup> Cham. *Philippine Power Sector*.

<sup>363</sup> Sulistiyanto, P., and Wu, X. (2004). *The Political Economy of Power Sector Restructuring in Southeast Asia*. Paper presented at the Conference on Regulation, Deregulation and Re-regulation in Globalizing Asia, March 22-24, National University of Singapore, Singapore.

<sup>364</sup> Senate and House of Representatives of the Philippines in Congress. (2001). Republic Act no. 9136: An Act Ordaining Reforms in the Electric Power Industry, Amending for the Purpose Certain Laws and for Other Purposes. Retrieved from <https://www.doe.gov.ph/sites/default/files/pdf/issuances/20010608-ra-09136-gma.pdf?withshield=1>

<sup>365</sup> Official Gazette. (2004, August 6). *Speech of President Arroyo during the 25th Annual General Membership Meeting and Silver Anniversary of the Philippine Rural Electric Cooperatives Association, Inc. (PHILRECA)*. Retrieved from <https://www.officialgazette.gov.ph/2004/08/06/speech-of-president-arroyo-during-the-25th-annual-general-membership-meeting-and-silver-anniversary-of-the-philippine-rural-electric-cooperatives-association-inc-philreca/>

establishment of the Energy Regulatory Commission to oversee customer choices and electricity market competition and development.<sup>366</sup>

The passage of the 2001 EPIRA marked a pivotal moment for the Philippine electricity industry. It ushered in a new era of private sector involvement, a characteristic that had defined the Philippine energy sector since its colonial beginnings and continued until before the Marcos Martial Law era. This historical root arguably facilitated the transition back to privatisation, which received broad support despite some resistance in the country's democratic society that gave space for Civil Society Organisations (CSOs) to express their opinions openly. Attorney Jose M. Layug, Jr., the President of Developers of Renewable Energy for AdvanceMent, Inc. (DREAM), who was also a former Chair of the National Renewable Energy Board (NREB) from 2016 to 2018, and a former Undersecretary of the Department of Energy from 2010 to 2012, believed that the private sector was indeed a better agent to deliver electricity services.<sup>367</sup> Similarly, Mr John Mark Napao, the President and Founder of Solar for Hope, endorsed the private sector's role in energy provision, citing the higher performance standards and fewer bureaucratic obstacles compared to government-run projects.<sup>368</sup> Mr Renato Redentor B. Constantino, Executive Director of Institute for Climate and Sustainable Cities (ICSC), also regarded the liberalisation of the electricity industry as a commendable move.<sup>369</sup>

The 2001 EPIRA was transformative as it provided a comprehensive framework to restructure the electricity industry. It facilitated the privatisation of state-owned NPC assets, transitioned the sector to the desired competitive structure, and clearly defined the roles of various government agencies and private entities. Senior staff from Aboitiz Power Corporation affirmed that the 2001

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<sup>366</sup> Cham. *Philippine Power Sector*.

<sup>367</sup> Interview with Attorney Jose M. Layug, Jr., the President of Developers of Renewable Energy for AdvanceMent, Inc. (DREAM), who is also a former Chair of the National Renewable Energy Board (NREB) from 2016 to 2018, and a former Undersecretary of the Department of Energy from 2010 to 2012, in Manila, 17 January 2023.

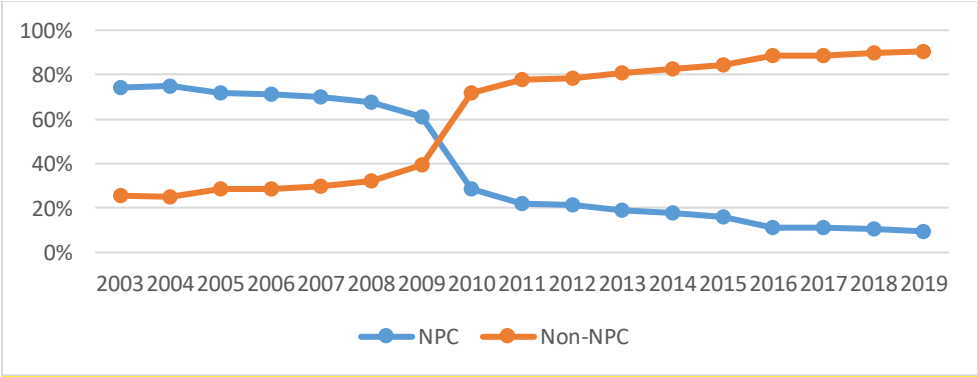
<sup>368</sup> Interview with Mr John Mark Napao, President and Founder of Solar for Hope, in Manila, 13 January 2023.

<sup>369</sup> Constantino, R. R. B. Interview. 2023.

EPIRA was a gamechanger as it allowed the company to participate again in electricity generation after not being able to do so during Marcos era.<sup>370</sup> Ms Irene Maranan, Vice President and Head of Communications & Sustainability of ACEN, also highlighted EPIRA’s transformative influence, noting that it opened the door for private company participation in electricity provision.<sup>371</sup> For ACEN, this was particularly significant given that its mother company the Ayala Group, which is one of the largest conglomerate-run business empires in the Philippines, had never previously ventured into the energy sector. The 2001 EPIRA thus provided the Ayala Group with the opportunity to enter the electricity market, leading to the establishment of AC Energy (the former name of ACEN) in 2011.<sup>372</sup>

The 2001 EPIRA subsequently resulted in a dramatic reversal in electricity generation, with the NPC’s share gradually decreasing and the private company (non-NPC)’s share steadily increasing, as depicted in Figure 3.3 below.

**Figure 3. 3: Gross Power Generation Share by Ownership in the Philippines (2003 to 2019)**



Source: DOE. (2020a). *2019 Power Statistics: Gross Power Generation by Ownership (in MWh)*. Retrieved from [https://www.doe.gov.ph/sites/default/files/pdf/energy\\_statistics/2019\\_power\\_statistic\\_06\\_generation\\_per\\_ownership\\_per\\_grid.pdf](https://www.doe.gov.ph/sites/default/files/pdf/energy_statistics/2019_power_statistic_06_generation_per_ownership_per_grid.pdf)

<sup>370</sup> Aboitiz Power Corporation senior staff. Interview. 2023.  
<sup>371</sup> Interview with Ms Irene Maranan, Vice President and Head of Communications and Sustainability of ACEN, in Manila, 16 January 2023.  
<sup>372</sup> Maranan, I. Interview. 2023.

Critically, the 2001 EPIRA fundamentally changed *the State relation with the private sector* by establishing a dependent *relation between the State and the private sector* given the latter's central role in the country's electricity provision. Consequently, the State must carefully consider the private sector's interests to ensure the country's energy security. One clear example was in the pass-through arrangement in the electricity sector, which automatically transferred any price fluctuations to consumers, thereby minimising risk for companies, secured their profits, and facilitated their access to financing.<sup>373</sup> This new type of *relation between the State and the private sector* implies that decisions regarding electricity provision, including investment in energy sources, are largely driven by market forces and private companies' profit-making interests. Consequently, the State must address these needs when it wished to steer private sector decisions in specific directions that were not yet profitable for the private companies. This was particularly relevant in the early phase of renewable energy development when its costs were still relatively high.

The State having preferences towards a certain direction during Macapagal-Arroyo's presidency was expected given that she considered the energy sector as a strategic instrument for the country's economic recovery agenda. Poverty reduction was a priority following her victory in the 2004 presidential election, and was to be realised through job creation and economic growth from 4.9-5.8 percent GDP in 2004 to as high as 7.0-8.0 percent GDP in 2010.<sup>374</sup> Within that vision, electricity provision was made part of her presidency's 10-point agenda,<sup>375</sup> and unlike the previous administrations, Macapagal-Arroyo perceived the energy sector not only as an enabler of

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<sup>373</sup> Constantino, R. R. B. Interview. 2023.

<sup>374</sup> NEDA (The National Economic and Development Authority). (2004). *Medium-Term Philippine Development Plan 2004-2010*. Manila: NEDA. Retrieved from <https://static1.squarespace.com/static/56aec2aa76d99c5d803d91b5/t/57466c94f8baf3649a5fc993/1464233218124/Medium+Term+Development+Plan+2004-2010.pdf>

<sup>375</sup> Official Gazette. (2004, June 30). *Second Inaugural Address of President Gloria Macapagal-Arroyo*. Retrieved from <https://www.officialgazette.gov.ph/2004/06/30/second-inaugural-address-of-president-gloria-macapagal-arroyo-june-30-2004/>

economic growth, but as a direct contributor to the economy itself, primarily through job creation.<sup>376</sup>

This vision was complemented by an enhanced focus on energy independence as part of the five key reform packages formulated to realise her 10-point agenda.<sup>377</sup> This demonstrated a path dependence and a continuation of the energy independence goal that began during the Marcos administration in response to the 1973 global oil crisis. Towards this end, Macapagal-Arroyo laid down policy directions that aimed at enhancing domestic production and reducing import dependence. Building on previous policies, she introduced measures that included increasing domestic oil and gas production, boosting geothermal investment and capacity, developing renewable energy sources such as biomass, solar, wind, and ocean sources, increasing the use of alternative fuels such as natural gas in the transportation and electricity sectors, and promoting energy efficiency and conservation programs.<sup>378</sup>

Under Macapagal-Arroyo's leadership, the State's energy independence objective made progress since she became president in 2001. The share of indigenous energy sources in the Philippines' primary energy supply mix improved from 45.5 percent in 2001<sup>379</sup> to 55.5 percent in 2004.<sup>380</sup> The bulk of indigenous sources was renewable energy sources, comprising geothermal (7.2 percent), hydropower (4.9 percent) and other renewable sources (31.0 percent) in 2001.<sup>381</sup> Solar and wind energy sources were already being developed during this time,<sup>382</sup> building on a study of the

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<sup>376</sup> Official Gazette. (2004, July 26). Fourth State of the Nation Address of Her Excellency Gloria Macapagal-Arroyo President of the Philippines During the Opening of the 1<sup>st</sup> Regular Session of the 13th Congress. Retrieved from <https://www.officialgazette.gov.ph/2004/07/26/gloria-macapagal-arroyo-fourth-state-of-the-nation-address-july-26-2004/>

<sup>377</sup> Official Gazette. *Fourth State of the Nation Address*.

<sup>378</sup> Official Gazette. *Speech of President Arroyo during the 25th Annual General Membership Meeting and Silver Anniversary of the Philippine Rural Electric Cooperatives Association, Inc. (PHILRECA)*.

<sup>379</sup> DOE. (2003). *Philippine Energy Plan 2003-2012*. Retrieved from [https://www.doe.gov.ph/sites/default/files/pdf/downloads/pep\\_2003-2012.pdf](https://www.doe.gov.ph/sites/default/files/pdf/downloads/pep_2003-2012.pdf)

<sup>380</sup> DOE. (2004). *Philippine Energy Plan 2004-2013*. Retrieved from [https://www.doe.gov.ph/sites/default/files/pdf/downloads/pep\\_2004\\_2013.pdf](https://www.doe.gov.ph/sites/default/files/pdf/downloads/pep_2004_2013.pdf)

<sup>381</sup> DOE. *Philippine Energy Plan 2003-2012*.

<sup>382</sup> DOE. *Philippine Energy Plan 2004-2013*.

Philippines' wind power potential that was conducted by the United States' National Renewable Energy Laboratory in the late 1990s.<sup>383</sup>

It is apparent, therefore, that renewable energy sources played a key role in the Philippine energy independence goal. This was further demonstrated in the country's ambitious plan to increase the capacity of renewable energy by 100 percent by 2013, double hydropower capacity by 2013, develop 130-250MW of biomass, solar and ocean capacity, enhance the country's geothermal production to become the largest in the world, and turn the country to become a leader in wind energy production and an export hub for solar manufacturing in Southeast Asia.<sup>384</sup>

The country's grand vision for renewable energy development was formulated against the backdrop of rising climate concerns and decreasing renewable energy costs at the global level. Between the 1990s and 2000s, the price of solar photovoltaic (PV) cells dropped by about 50 percent.<sup>385</sup> Macapagal-Arroyo observed that global investment in solar reached a record USD71 billion in 2007 and drew optimism of its prospects from oil-giant Abu Dhabi's establishment of a renewable energy corporation.<sup>386</sup> Despite renewable energy high costs at the time, Macapagal-Arroyo strategically viewed these trends as a promising opportunity for the country to capitalise on and benefit from.

The State's enthusiasm for renewable energy sources facilitated the passage of the Renewable Energy Act in 2008, which deliberations had begun in the 1990s, driven by environmental considerations, the ecological benefits of clean energy, and energy modernisation.<sup>387</sup> Its passage

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<sup>383</sup> Interview with Michael Abundo, PhD., Assistant Director and Programme Manager of the Saab-NTU Joint Lab, based in Singapore, 18 February 2021.

<sup>384</sup> DOE. *Philippine Energy Plan 2004-2013*.

<sup>385</sup> Gul, M., Kotak, Y., and Muneer, T. (2016). Review on Recent Trend of Solar Photovoltaic Technology. *Energy Exploration & Exploitation*, (34)(4), 485 – 526.

<sup>386</sup> Official Gazette. (2008, December 16). *Speech of President Arroyo During the Signing Ceremony of Republic Act 9513 or the Renewable Energy Act of 2008*. Retrieved from <https://www.officialgazette.gov.ph/2008/12/16/speech-of-president-arroyo-during-the-signing-ceremony-of-republic-act-9513-or-the-renewable-energy-act-of-2008/>

<sup>387</sup> Constantino, R. R. B. Interview. 2023.

came against the backdrop of climate change discussions that began in the country in the 1990s<sup>388</sup> during Aquino's presidency, a decade of active campaigning for renewable energy development by CSOs,<sup>389</sup> and ongoing operationalisation of the Clean Development Mechanism following the ratification of the Kyoto Protocol in 2003.<sup>390</sup>

Although the case for the passage of the Renewable Energy Act was strong, there were setbacks during the process, particularly due to concerns over renewable energy high costs.<sup>391</sup> This concern was shared by both the public and policymakers.<sup>392</sup> Additionally, there was pushback from the Bureau of Internal Revenue regarding the incentives offered to the renewable energy sector.<sup>393</sup>

The Philippines had indeed been grappling with high energy prices for years. Even before the passage of the 2001 EPIRA, the Philippines had some of the highest electricity tariffs in Asia, a sensitive issue that often provoked public ire and led to mass protests, particularly during oil price surges in 2003 following the Iraq-US war, in 2005 after the introduction of tax measures on imported oil products, and in 2008 during the oil crisis.<sup>394</sup> The high electricity tariffs can be attributed to the private sector's for-profit interests<sup>395</sup> which the State needs to accommodate to ensure the country's overall energy security. This is evident in the fact that, even seventeen years

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<sup>388</sup> Interview with Jalton Garces Taguibao, PhD., Associate Professor of Political Science and Public Management at the University of the Philippines-Diliman based in Manila, 25 January 2021.

<sup>389</sup> Interview with Mr Gerry Arances, National Coordinator of the Philippine Movement for Climate Justice based in Manila, 24 March 2021.

<sup>390</sup> The Republic of the Philippines. *Second National Communication to the United Nations Framework Convention on Climate Change*.

<sup>391</sup> Arances, G. Interview. 2021.

<sup>392</sup> Constantino, R. R. B. Interview. 2023.

<sup>393</sup> Tan, H. A. C. (2016, August 9). The Philippines' Renewable Energy Sector is Booming (And It Could Get Bigger). Retrieved from CNBC: <https://www.cnbc.com/2016/08/09/the-philippines-renewable-energy-sector-is-booming-and-it-could-get-bigger.html>

<sup>394</sup> La Viña, A. G. M., Dulce, J. C., and Saño, N. (2011). National and Global Energy Governance: Issues, Linkages and Challenges in the Philippines. *Global Policy*, (2)(s1), 80 – 93.

<sup>395</sup> Arances, G. Interview. 2021.

after the passage of the EPIRA, the Philippines continued to impose one of the highest electricity tariffs in Asia.<sup>396</sup>

The government had intervened several times to maintain electricity price at a certain level, for example by giving a discount of PhP0.30 per kilowatt hour (kWh) for residential customers in 2001, and by placing a cap in the NPC's power purchase cost adjustment to PhP0.40/kWh, down from PhP1.25/kWh.<sup>397</sup> Regardless of such efforts, electricity pricing in the Philippines remained high. In 2008, Macapagal-Arroyo ordered Meralco to lower electricity rate,<sup>398</sup> but the company refused to do so, claiming that their rate was as low as it could get.<sup>399</sup>

It is apparent, therefore, that the high costs of renewable energy posed a significant challenge to the formulation of the 2008 Renewable Energy Act, especially within the context of the Philippine electricity industry, which was already characterised by high electricity tariffs. The State's determination to advance the Act regardless of such obstacle, on the grounds of their potential economic benefits and contribution to energy independence, was thus critical in pushing renewable energy development further.

The passage of the 2008 Renewable Energy Act was a pivotal moment for the country's energy sector. An official from the Philippine Department of Energy confirmed that the 2008 Renewable Energy Act served as a flagship law promoting the development, utilisation, and commercialisation of renewable energy sources as it established the framework and strategic program to accelerate renewable energy advancement and increase its use.<sup>400</sup> A significant follow-

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<sup>396</sup> Lectura, L. (2018). *Average Electricity Price in PHL 2nd Highest in Asia - Think Tank*. Retrieved from Business Mirror: <https://businessmirror.com.ph/2018/08/07/average-electricity-price-in-phl-2nd-highest-in-asia-think-tank/>

<sup>397</sup> La Viña et al. *National and Global Energy Governance: Issues, Linkages and Challenges in the Philippines*.

<sup>398</sup> Francisco, R. (2008, May 7). *Row at Philippine Utility May Backfire on Government*. Retrieved from Reuters: <https://www.reuters.com/article/philippines-meralco-idUSMAN18682620080507>

<sup>399</sup> Reuters Staff. (2008, May 8). UPDATE 1- Philippines' Lopez Says Wants Out of Meralco. Retrieved from Reuters: <https://www.reuters.com/article/philippines-meralco-idUSMAN6368520080508>

<sup>400</sup> The Philippine Department of Energy official. Interview. 2023.

up was seen in the creation of the Renewable Energy Management Bureau (REMB) in the Department of Energy. Importantly, considering the country's electricity structure that heavily relied on the private sector that accounted for nearly 90 percent of electricity generation in 2020,<sup>401</sup> the provisions of incentives in the Renewable Energy Act was crucial to get the private sector onboard of the renewable energy development agenda.

The State's reliance on the private sector and its need to address private sector's interests were reflected in the arrangement of the National Renewable Energy Board (NREB), which included industry representation. Established under the mandate of the 2008 Act, the NREB served as a consultative platform and advisory body that provided recommendations to the Department of Energy. The involvement of the private sector in the NREB thus ensured that interests of the industry were represented and considered in decision-making processes.<sup>402</sup>

Since its enactment in 2008, all supporting policy mechanisms mandated by the Renewable Energy Act such as the Net-Metering Program (NMP), the Renewable Portfolio Standards (RPS) for on-grid and off-grid areas, the Green Energy Auction Program (GEAP), and the Green Energy Option Program (GEOP) have been implemented.<sup>403</sup>

The NMP was the first incentive that was introduced, primarily to stimulate solar power development.<sup>404</sup> Subsequently, the RPS, launched in 2020, demonstrated the State's deliberate attempt to create renewable energy market by mandating electricity suppliers, particularly the distribution utilities, to source a fraction of their power supply from eligible renewable energy

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<sup>401</sup> DOE. (2020c). *37th Electric Power Industry Reform Act (EPIRA) Implementation Status Report (For the Report Period October 2020)*. Retrieved from [https://www.doe.gov.ph/sites/default/files/pdf/electric\\_power/37th\\_epira\\_report\\_october\\_2020.pdf](https://www.doe.gov.ph/sites/default/files/pdf/electric_power/37th_epira_report_october_2020.pdf)

<sup>402</sup> Abundo, M. Interview. 2021.

<sup>403</sup> The Philippine Department of Energy official. Interview. 2023.

<sup>404</sup> DOE. (n.d.d). *Net Metering Home*. Retrieved on August 30, 2024, from <https://doe.gov.ph/net-metering-home>

resources. Through the DC 2022-09-0030 issued in 2022,<sup>405</sup> the government gave a preferential dispatch option in the Wholesale Electricity Spot Market (WESM) to all qualified and registered generating units using renewable energy sources, and increased the adjusted annual percentage increment from 1 percent to 2.52 percent to all mandated participants of the RPS starting from 2023.<sup>406</sup> From then on, the percentage increased by 2.52 percent year on year and was envisioned to reach more than 50 percent share by 2040.<sup>407</sup>

Like the RPS, the GEOP was designed to increase renewable energy share on the grid. Initiated in late 2021 by the Independent Electricity Market Operator of the Philippines, the GEOP allowed consumers to choose their electricity from licensed renewable energy suppliers.<sup>408</sup> This contrasted with the previous practice where end-consumers had no say over the energy mix provided by distribution utilities. The combination of the RPS and the GEOP was evidently aimed at expanding the renewable energy market significantly.

The GEAP was the latest incentive being rolled out. It provided a competitive framework to facilitate immediate and timely investment in new and additional renewable energy sources and ensure the provision of adequate supply. The first round of the Green Energy Auction (GEA) was held on 17 June 2022, awarding 18 bidders to deliver 1,866.93 megawatts (MW) of renewable energy capacity by 2023 to 2025.<sup>409</sup> The second round of GEA in July 2023 saw private sector

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<sup>405</sup> DOE. (2022b). *Department Circular No. DC2022-09-0030: Prescribing the Adjusted Annual Percentage Increment to be Imposed on All Mandated Participants of the Renewable Portfolio Standards for On-grid Areas*. Retrieved from <https://www.doe.gov.ph/sites/default/files/pdf/issuances/dc2022-09-0030.pdf>

<sup>406</sup> The Philippine Department of Energy official. Interview. 2023.

<sup>407</sup> Lotilla, R. P. M. (2022, September 23). *Department Circular No. OC2022-09-0030: Prescribing the Adjusted Annual Percentage Increment to be Imposed on All Mandated Participants of the Renewable Portfolio Standards for On-Grid Areas*. Retrieved from <https://www.doe.gov.ph/sites/default/files/pdf/issuances/dc2022-09-0030.pdf?withshield=2>

<sup>408</sup> Santiago, D. J. (2021, December 3). *IEMOP launches the Green Energy Option Program*. Retrieved from The Manila Times: <https://www.manilatimes.net/2021/12/03/supplements/iemop-launches-the-green-energy-option-program/1824542>

<sup>409</sup> Capongcol, M. C. (2023, April 27). *Green Energy Auction Program*. Taguig City: Department of Energy. Retrieved from [https://doe.gov.ph/sites/default/files/pdf/e\\_ipo/02\\_Green%20Energy%20Auction%20Program%202023.pdf](https://doe.gov.ph/sites/default/files/pdf/e_ipo/02_Green%20Energy%20Auction%20Program%202023.pdf)

commitments to develop approximately 3,500 MW of various renewable energy technologies.<sup>410</sup> The private sector's enthusiastic participation in the GEAP reflected their confidence in the State's commitment to promote renewable energy. Following the assessment and recommendation of the Department of Energy and the NREB, the Department of Energy planned to conduct the GEA annually to encourage more renewable energy investments.<sup>411</sup> The GEAP, which designated the TransCo corporation as the off-taker of the electricity generated by project developers, had the potential to further boost renewable energy development further.<sup>412</sup>

The private sector was generally satisfied with the government's measures.<sup>413</sup> Ms Maranan confirmed that the 2008 Renewable Energy Act incentivised company ACEN to enter the renewable energy business. She praised the FiT, GEAP and RPS incentives for providing assurance, clarity, and confidence in the government's direction in the energy sector. The trust in the government's commitment to renewable energy development encouraged ACEN to begin divesting its coal assets in 2019, successfully reducing its coal portfolio share from 60 percent to zero.<sup>414</sup> Similarly, senior staff from the Aboitiz Power Corp stated that the company was content with the various renewable energy supports provided by the government.<sup>415</sup>

Private sector's positive reactions reflected a *synergistic relationship with the State*. This was further evidenced by private sector respondents mentioning no complaints about government involvement when discussing challenges in developing renewable energy in the Philippines.<sup>416</sup> Instead, they cited technical constraints such as insufficient transmission lines, limited land

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<sup>410</sup> DOE. (2023, July 3). *DOE Conducts 2nd Round of Green Energy Auction in the Philippines*. Retrieved on August 30, 2024, from <https://doe.gov.ph/press-releases/doe-conducts-2nd-round-green-energy-auction-philippines>

<sup>411</sup> The Philippine Department of Energy official. Interview. 2023.

<sup>412</sup> Interview with a senior official from the Renewable Energy Management Bureau (REMB) of the Philippine Department of Energy, in Manila, 13 January 2023.

<sup>413</sup> Interview with Mr Roger Chua, President of the Web Philippines based in Manila, 12 February 2021.

<sup>414</sup> Maranan, I. Interview. 2023.

<sup>415</sup> Aboitiz Power Corporation senior staff. Interview. 2023.

<sup>416</sup> Aboitiz Power Corporation senior staff. Interview. 2023; Maranan, I. Interview. 2023; Chua, R. Interview. 2021.

availability, and the relatively small generating capacities of renewable energy sources. The challenge in connecting renewable energy sources to the grid was exemplified in the Visayas region where solar, biomass, and geothermal facilities were prepared for connection but still awaited the necessary infrastructure<sup>417</sup> at the time of this dissertation writing.

Similar to the incentives provided for in the 2008 Renewable Energy Act, State's dependence on the private sector compelled it to respond to these technical hurdles to ensure the private sector's continuing commitment in renewable energy expansion. One initiative was by developing the Competitive Renewable Energy Zone (CREZ),<sup>418</sup> which was defined as "a geographic area with high concentrations of cost-effective renewable energy and strong developer interest," illustrated by the green circles in Figure 3.4.<sup>419</sup>

While the dependent nature of *the State relation with the private sector* had encouraged private investment in renewable energy, the State authority in the sector was insufficient to fully steer the private companies towards maximising the country's energy potential. This was because the private sector's profit-driven interests led to selectiveness in developing renewable energy sources, depending on the risk profiles that each type of renewable energy sources had. Consequently, the private sector tended to prefer those that presented lower risks and promised higher profits.

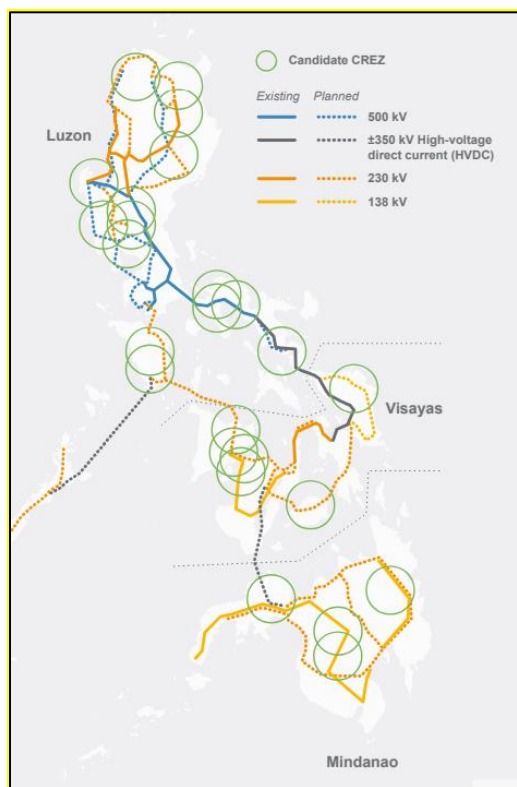
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<sup>417</sup> Napao, J. M. Interview. 2023.

<sup>418</sup> The Philippine Department of Energy official. Interview. 2023.

<sup>419</sup> Lee, N. Dyerson, A., Hurlbut, D. McCan, I., Neri, E. V., Reyes, N. C. R., Capongcol, M. C., Cubangbang, H. M., Agustin, B. P. Q., Bagsik, J., and Leisch, J. (2020). *Ready for Renewables - Grid Planning and Competitive Renewable Energy Zones (CREZ) in the Philippines*. National Renewable Energy Laboratory (NREL), (Department of Energy of the Philippines (DOE), National Grid Corporation of the Philippines (NGCP), and United States Agency for International Development (USAID). Retrieved from <https://www.nrel.gov/docs/fy20osti/76235.pdf>; p.7.

**Figure 3. 4: Competitive Renewable Energy Zones (CREZ) in the Philippines**



Source: Lee, et al. *Ready for Renewables - Grid Planning and Competitive Renewable Energy Zones (CREZ) in the Philippines*, p.7.

The limitations of the State's influence were evident in the following examples. Despite offering substantial fiscal and non-fiscal incentives to promote a variety of renewable energy sources, hydropower had garnered limited private sector interest. This was due to challenges such as difficult locations in mountainous areas and lengthy project gestation periods, and the need for hydropower and geothermal projects often to obtain extra clearances on socio-environmental aspects such as securing community consents, regulatory approvals related to indigenous rights and environmental protection, and addressing concerns about endangered species.<sup>420</sup> As such, despite government efforts, the Feed-in-Tariff (FiT) quota for hydropower remained unmet. This

<sup>420</sup> REMB senior official. Interview. 2023.

was in contrast with oversubscribed quotas for more profitable solar and wind energy projects, which prompted the REMB to impose FiT quota caps on these technologies.<sup>421</sup>

The private sector confirmed their preferences for solar and wind power. Senior staff at the Aboitiz Power Corp mentioned that the company evaluated several factors when choosing renewable energy projects and it decided to focus on wind, solar, and battery storage technologies<sup>422</sup> at the time of this dissertation writing. Ms Maranan from ACEN similarly noted that while the company initially considered various renewable energy sources, it decided against pursuing geothermal and hydropower options because geothermal sources were difficult to find, and hydropower was not only hard to find but also presented high social risks such as community displacements. As a result, ACEN opted to focus on developing solar and wind power<sup>423</sup> at the time of this dissertation writing.

The private sector's selectiveness was evident in the lack of commitment to biomass and waste-to-energy projects, which contrasted sharply with overwhelming responses to ground-mounted solar that neared 2,000 MW, and onshore wind at approximately 1,500 MW, during the second round of the GEA in July 2023.<sup>424</sup>

State determination to develop renewable energy not only galvanised the private sector, but also spurred significant action within State institutions themselves to make bureaucratic processes more effective. To address time- and resource-consuming process of acquiring project permits,<sup>425</sup> the Energy Virtual One-stop Shop (EVOSS) Law was passed in 2019 to streamline the permitting process for power generation, transmission, and distribution projects.<sup>426</sup> This Law held both

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<sup>421</sup> REMB senior official. Interview. 2023.

<sup>422</sup> Aboitiz Power Corp senior staff. Interview. 2023.

<sup>423</sup> Maranan, I. Interview. 2023.

<sup>424</sup> DOE. *DOE Conducts 2nd Round of Green Energy Auction in the Philippines*.

<sup>425</sup> The Philippine Department of Energy official. Interview. 2023.

<sup>426</sup> Senate and House of Representatives of the Philippines in Congress. (2019, March 8). *Republic Act No. 11234: An Act Establishing the Energy Virtual One-Stop Shop for the Purpose of Streamlining the Permitting Process of Power Generation, Transmission, and Distribution Projects*. Retrieved from <https://www.officialgazette.gov.ph/downloads/2019/03mar/20190308-RA-11234-RRD.pdf>

project applicants and relevant government agencies accountable to deadlines, imposing penalties on government agencies if processes did not complete within stipulated timelines.<sup>427</sup> As a result, the processing time, which used to take about two years to complete, had become significantly shorter even though not all relevant government agencies were yet part of the EVOSS<sup>428</sup> at the time of this dissertation writing.

Furthermore, to enhance renewable energy financing, Section 19 of the Implementing Rules and Regulations (IRR) of the 2008 Renewable Energy Act was amended to allow 100 percent foreign ownerships in renewable energy projects including solar, wind, biomass and ocean energy.<sup>429</sup> The amendment, reflected in Department Circular (DC) No. 2022-11-00342 issued in 2022, was part of the strategic plan to realise offshore wind expansion, which was generally more costly, to circumvent land availability constraints.<sup>430</sup> The first-ever Philippine Offshore Wind Roadmap was formulated in partnership with the World Bank and Energy Sector Management Assistance Program (ESMAP) and was launched on 20 April 2022.<sup>431</sup> The State's aggressive attempts to obtain more financing for renewable energy development were likewise evident in the Open and Competitive Selection Process (OCSP3) for large-scale projects (minimum investment cost of USD50 million) of the Financial and Technical Assistance Agreement (FTAA), which had been revised to welcome foreign companies for geothermal exploration and development.<sup>432</sup>

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<sup>427</sup> REMB senior official. Interview. 2023.

<sup>428</sup> Layug Jr., J. M. Interview. 2023.

<sup>429</sup> DOE. (2022a). *Department Circular No. DC2022-11-0034: Prescribing Amendments to Section 19 of Department Circular No. DC2009-05-0008 Titled, Rules and Regulations Implementing Republic Act No. 95513, Otherwise Known as "The Renewable Energy Act of 2008."* Retrieved from <https://www.doe.gov.ph/sites/default/files/pdf/issuances/dc2022-11-0034.pdf>

<sup>430</sup> REMB senior official. Interview. 2023.

<sup>431</sup> World Bank. (2022, April 20). *Launch: Philippines Offshore Wind Roadmap*. Retrieved from <https://www.worldbank.org/en/events/2022/04/12/launch-philippines-offshore-wind-roadmap#:~:text=On%20April%2020%2C%202022%2C%20the,for%20developing%20a%20robust%20offshore>

<sup>432</sup> DOE. (2020, October 30). *DOE Statement on Allowing Foreign Investors 100% Ownership of Large-scale Geothermal Projects*. Retrieved from <https://doe.gov.ph/press-releases/doe-statement-allowing-foreign-investors-100-ownership-large-scale-geothermal-o>

Additionally, to achieve the target of 50 percent of renewable energy in the power generation mix as outlined in the Philippine Energy Plan 2020-2040, state-owned Philippine Electricity Market Corporation (PEMC) launched the Philippine Renewable Energy Market (REM) in August 2022. The REM facilitated the buying and selling of Renewable Energy Certificates (RECs). Although the transaction of RECs in the REM was limited to mandatory participants of the RPS, the PEMC planned to extend this transaction to voluntary market participants, including qualified end users such as the RE100 companies.<sup>433</sup> The transaction of RECs in the REM was projected to assist companies in achieving their renewable energy targets.

At this juncture, it is evident that the move towards renewable energy development was championed and facilitated by the State, building on path dependence along energy diversification trajectory established in the previous administrations. Although the *State was no longer involved in the electricity provision* following the 2001 EPIRA, it nonetheless still wielded considerable influence to steer the direction of energy choices in the country. Given that *State became largely dependent on the private sector* for electricity provision, the State exercised its influence by meeting private sector's for-profit interests. This was clearly exemplified in the provision of incentives in the Renewable Energy Act, which passage had the backing and push from President Macapagal-Arroyo. While private companies responded to such incentives positively, the extent of their effectiveness was limited by their for-profit interests that had the potential to curb the State's ambition to develop a variety of renewable energy sources. This was evidenced by the private sector's lack of enthusiasm for developing sources other than wind and solar power given their higher risks and therefore lesser profitability.

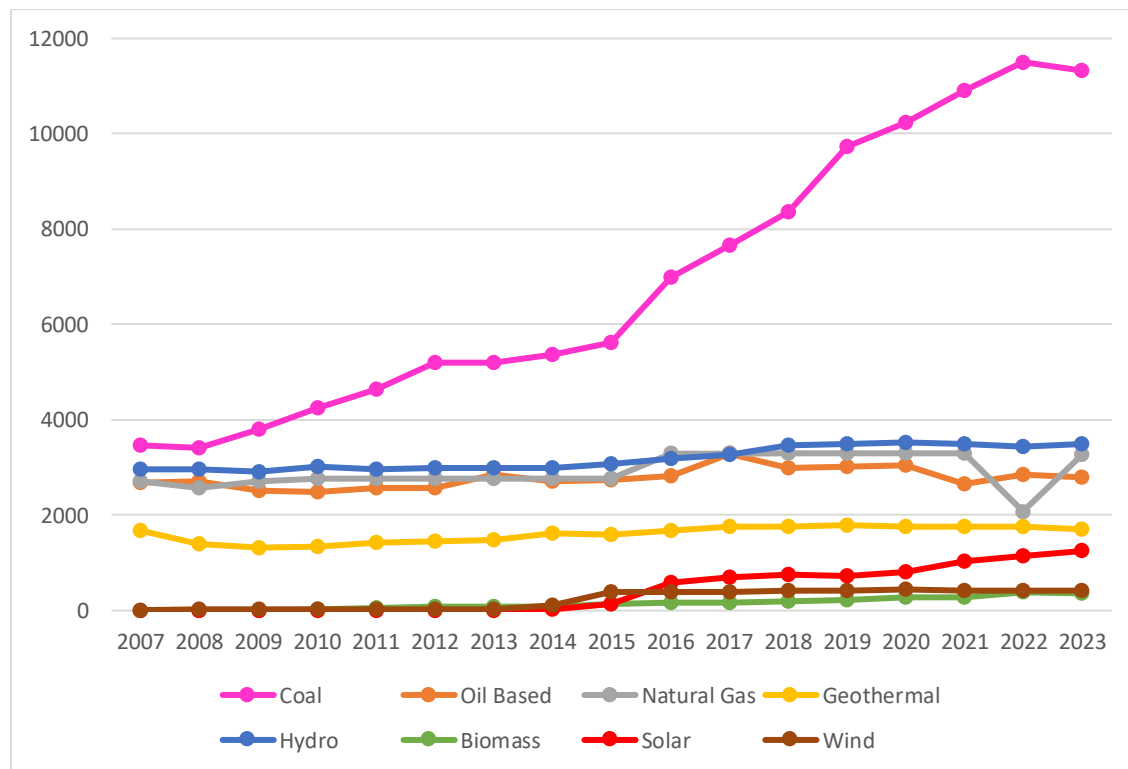
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<sup>433</sup> Presentation by Leonido J. Pulido III, President of the Philippine Electricity Market Corporation, in an online panel discussion titled *BW Insights: "The Philippines' Energy Transition Roadmap,"* organised by the Business World on 24 August 2022. Retrieved from Youtube: <https://www.youtube.com/watch?v=4pUNnvlffw>; RE100 companies is a global initiative bringing together the world's most influential businesses committed to 100% renewable electricity. See <https://www.there100.org/> for details.

### 3.7. Low-Carbon Energy Transition Development Progress

Renewable energy development is the initial step toward a low-carbon energy transition, which must be followed by reducing or replacing fossil fuel use to achieve a true low-carbon shift. In the Philippines, the 2008 Renewable Energy Act has significantly facilitated the expansion of renewable energy. This is evidenced by the increasing shares of wind and solar power in the country’s generation capacity since 2015, as shown in Figure 3.5 below.

**Figure 3. 5: Dependable Capacity per Grid, by Plant Type in MW (2007 to 2023)**



Source: DOE. (2020b). 2023 Power Statistics. Retrieved from [https://doe.gov.ph/sites/default/files/pdf/energy\\_statistics/O2\\_Installed%20and%20Dependable%20Capacity\\_2023.pdf](https://doe.gov.ph/sites/default/files/pdf/energy_statistics/O2_Installed%20and%20Dependable%20Capacity_2023.pdf)

While the progress in renewable energy development progress was promising, phasing out fossil fuels remained challenging due to the emphasis on energy security. This is evident in Figure 3.2, which shows a rise in coal usage from 2008 onwards along with renewable energy expansion until 2023. Given coal’s longstanding role as a major energy source in the country over the last two

decades, this trend suggests that the State's vision for renewable energy development was primarily driven by energy security and potential economic gains rather than climate concerns.<sup>434</sup> In terms of energy security, this had led to a technology-neutral approach with a focus on energy availability. Renewable energy sources were thus used to supplement fossil fuels. This approach was evident in the Philippine Energy Plan 2009-2030, which outlined the country's goal to double renewable energy capacity by 2030 while simultaneously increasing indigenous coal production by 250 percent.<sup>435</sup>

Although climate change was not the primary driver behind the passage of the 2008 Renewable Energy Act, climate change received considerable attention during Macapagal-Arroyo's presidency as evident in the passage of Climate Change Act in 2009, which led to the creation of Climate Change Commission under the President's Office.<sup>436</sup> The passage of this Act was built upon the country's ongoing response to the global climate agenda since the time of President Aquino in the 1990s.

In addition to protecting and advancing the right of the people to a healthy ecology, the 2009 Climate Change Act made a reference to sustainable development, the UNFCCC, and the Hyogo Framework of Action. This demonstrated the influence of the global climate processes in the formulation of the Act. The establishment of the Commission institutionalised climate agenda in the country as evidenced by the issuance of the National Framework Strategy in Climate Change 2010-2022. While the energy sector was not subject to climate agenda when the Philippines began to respond to the global climate agenda in the early 1990s, such initial response eventually got the

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<sup>434</sup> See: Official Gazette. *Speech of President Arroyo during the 25th Annual General Membership Meeting and Silver Anniversary of the Philippine Rural Electric Cooperatives Association Inc. (PHILRECA)*; and Official Gazette. *Speech of President Arroyo During the Signing Ceremony of Republic Act 9513 or the Renewable Energy Act of 2008*.

<sup>435</sup> Rein, A., & Cruz, K. (2008). Philippine Energy Policy and Development. *The Journal of Energy and Development*, 34(1/2), 129 – 140.

<sup>436</sup> Official Gazette. (2009, October 23). Republic Act No. 9729: An Act Mainstreaming Climate Change into Government Policy Formulations, Establishing the Framework Strategy and Program on Climate Change, Creating for this Purpose the Climate Change Commission, And For Other Purposes. Retrieved from <https://www.officialgazette.gov.ph/2009/10/23/republic-act-no-9729/>

energy sector exposed twenty years later as seen in the National Framework Strategy identifying the energy sector as both a target for climate adaptation and mitigation measures.<sup>437</sup> This demonstrated a path dependence on the sustainability trajectory that began during Aquino's presidency. Furthermore, like the 2009 Climate Change Act, the National Framework Strategy also reflected the importance of the global climate processes as evidenced by the mention of compliance to environmental treaties, especially the UNFCCC, in the document.

The path dependence along the country's response to the global climate agenda was further reflected in the subsequent formulation of the National Climate Change Action Plan (NCCAP) 2011-2028 during Benigno Aquino III's presidency.<sup>438</sup> The NCCAP provided a comprehensive list of strategies to climate-proof seven priority areas including food security, water sufficiency, ecological and environmental stability, human security, climate-friendly industries and services, sustainable energy, and knowledge and capacity development. For the energy sector, the emphasis was on the expansion of renewable energy sources through the implementation of the 2008 Renewable Energy Act.

Alongside the 2009 Climate Change Act, the passage of the Biofuel Act in 2006 also reflected the State's commitment to addressing climate change given that biofuel served as an oil substitute. The State's institutionalisation of climate measures in the energy sector initiated a layering mechanism by prominently introducing environmental aspect on top of economic gains and energy security considerations. However, given the technology-neutral approach that governed the sector, changes had been incremental. For example, the latest Philippine Energy Plan 2018-2040 outlined a strategy for the simultaneous expansion of both fossil fuels and renewable energy. It envisioned PhP2,062 billion worth of investments in renewable energy sources, including

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<sup>437</sup> Climate Change Commission. (2010). *National Framework Strategy on Climate Change 2010-2022*. Manila: Climate Change Commission. Retrieved from <https://climate.gov.ph/files/NFSCC.pdf>

<sup>438</sup> Climate Change Commission. (n.d.). *National Climate Change Action Plan 2011-2028*. Manila: Climate Change Commission. Retrieved from <https://climate.emb.gov.ph/wp-content/uploads/2016/06/NCCAP-1.pdf>

PhP2,040 billion for hydropower, PhP16.7 billion for geothermal, and solar PhP5.2 billion for solar, while planning to allocate a substantial PhP609.3 billion to boost coal production.<sup>439</sup>

The intention to expand coal production did not imply a preference for coal over renewable energy sources, given that coal remained superior in terms of cost competitiveness and its baseload characteristic that granted stable electricity output.<sup>440</sup> The lack of deliberate preference for coal or protection of coal interests was also evident in the pass-through arrangement that was given to coal-generated electricity on the basis of it being the dominant technology at the time.<sup>441</sup> The reference to coal's attributes and performance as justification for its continued expansion reflected a path dependence on coal's use in the country's energy sector, which began with the support and incentives provided for by the Marcos-era Coal Development Act of 1976 and continued even as incentives for renewable energy were being formulated and implemented.<sup>442</sup>

Interview respondents corroborated the observation that the technology-neutral approach was genuinely impartial, with no intentional favouritism toward coal over renewable energy sources. A senior staff member from the Aboitiz Power Corp emphasised that there was no competition between coal and renewable energy sources, noting that it was not a zero-sum game, and pointed to the coal moratorium announced by the government in late 2020 as the evidence of no deliberate effort to perpetuate coal usage at the expense of renewable energy sources.<sup>443</sup> Although it did not guarantee a definitive end to coal use, the coal moratorium, announced when global coal price

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<sup>439</sup> DOE. (2018). *Philippine Energy Plan 2018-2040*. Retrieved from <https://www.doe.gov.ph/sites/default/files/pdf/pep/PEP%202018-2040%20Complete.pdf>

<sup>440</sup> REMB senior official. Interview. 2023.

<sup>441</sup> Constantino, R. R. B. Interview. 2023.

<sup>442</sup> REMB senior official. Interview. 2023.

<sup>443</sup> Aboitiz Power Corp senior staff. Interview. 2023.

rebounded post-COVID-19,<sup>444</sup> signaled the government's favourable stance towards renewable energy sources.<sup>445</sup>

Despite the technology-neutral emphasis, the path dependence on coal use inadvertently created barriers to the deployment of renewable energy sources, evident in procurement processes that favoured fossil fuels.<sup>446</sup> The path dependence on coal use also made the State susceptible to coal group lobbying, as seen during the Rodrigo Duterte administration (2016-2022), which leaned towards supporting coal, thereby creating uncertainties regarding the future path of renewable energy development, leading the private sector to rely heavily on the State's signals for its investment decisions in renewable energy sources.<sup>447</sup>

The signals were indeed mixed during Duterte's presidency as he, despite earlier expressing his reservation to signing the 2015 Paris Agreement, eventually decided to do so in 2017 following a cabinet decision.<sup>448</sup> The country's Senate subsequently ratified the Agreement in the same year as reflected in Senate Resolution No. 320.<sup>449</sup> As follow-up process, the Philippines communicated its Nationally Determined Contribution in 2021, pledging greenhouse gas emission reduction and avoidance by 75 percent between 2020 and 2030 in agriculture, wastes, industry, transport and energy sectors, with a breakdown of 2.71 percent by the country's own effort and 72.29 percent conditional on external support.<sup>450</sup> This development thus again demonstrated a path dependence

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<sup>444</sup> See the price trend in: Agnolucci, P., Nagle, P., and Temaj K. (2023, March 21). *Declining Coal Prices Reflect a Reshaping of Global Energy Trade*. Retrieved from World Bank Blogs:

<https://blogs.worldbank.org/opendata/declining-coal-prices-reflect-reshaping-global-energy-trade>

<sup>445</sup> Constantino, R. R. B. Interview. 2023.

<sup>446</sup> Arances, G. Interview. 2021.

<sup>447</sup> Layug Jr., J. M. Interview. 2023.

<sup>448</sup> dela Cruz, E. (2017, March 1). *Philippines' Duterte Signs Paris Pact on Climate Change*. Reuters. Retrieved from <https://www.reuters.com/article/world/philippines-duterte-signs-paris-pact-on-climate-change-idUSKBN1683Io/>

<sup>449</sup> Congress of the Republic of the Philippines. (2017, March 8). *Resolution Concurring in the Accession to the Paris Agreement*. Retrieved on August 30, 2024, from <https://legacy.senate.gov.ph/lisdata/25521220251.pdf>

<sup>450</sup> Republic of the Philippines. (2021, April 15). *Nationally Determined Contribution Communicated to the UNFCCC*. Retrieved on August 30, 2024, from <https://unfccc.int/sites/default/files/NDC/2022-06/Philippines%20-%20NDC.pdf>

on the country's response to the global climate agenda regardless of President Duterte's initial reservations to continue this trajectory.

The change in political leadership to President Ferdinand "Bongbong" Romualdez Marcos Jr. in 2022 presented an opportunity to shift the Philippine energy strategy from a technology-neutral stance towards a path dependence along low-carbon energy transition trajectory following the coal moratorium in 2020. This potential transformation was supported by his projected stronger commitment to renewable energy compared to the previous administration. President Marcos Jr.'s inclination towards renewable energy was likely influenced by his personal preferences, given his roots in the Ilocos Province that was known for its wind power plants.<sup>451</sup>

The momentum towards increased use of renewable energy sources was further supported by the evolving economics of coal in relation to electricity pricing. Although coal had long been the most economical energy source in the Philippines, global events such as the ongoing war in Ukraine and Hamas-Israel conflict had impacted international energy markets, driving up coal prices and eroding its cost competitiveness. Consequently, even though renewable energy remained relatively costly at the time of this dissertation writing, coal had become more expensive in comparison.<sup>452</sup>

In contrast, since the time of Macapagal-Arroyo's presidency, the declining costs of renewable energy had been perceived as both an enabler and a source of hope for increased renewable energy use. In a virtual public panel discussion, Ms. Sharon Ocampo-Montañer, the Director of Market Operations Service of the Energy Regulatory Commission, highlighted that the cost of solar power at the time of the passage of the 2008 Renewable Energy Act was PhP9.68/kWh, but it had since

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<sup>451</sup> Layug Jr., J. M. Interview. 2023.

<sup>452</sup> Layug Jr., J. M. Interview. 2023.

decreased by more than 60 percent.<sup>453</sup> According to her, this demonstrated that solar technology had reached grid parity and could now compete with conventional (fossil-based) energy.

In the same virtual panel discussion, Mr Michael O. Sinocruz, the OIC-Director of the Energy Policy and Planning Bureau of the Philippine Department of Energy, expressed optimism that the success story of solar power expansion provided a reason to believe that other technologies, such as hydrogen and Carbon Capture, Utilisation and Storage (CCUS), which were still expensive at the time of this dissertation writing, would eventually become financially viable.<sup>454</sup> Being part of the State apparatus, the responses of Ms. Ocampo-Montañer and Mr Sinocruz reflected the extent of the State's observation and internationalisation of the prospects of renewable energy development and its strong conviction in the feasibility of transitioning to low-carbon energy.

The optimism for low-carbon energy transition pathway that was triggered by Marcos Jr. ascent to presidency was likewise apparent in the nuclear sector. Despite existing opposition to nuclear energy source, the 70 percent of survey respondents who expressed acceptance to nuclear use, along with the 31 million out of the 50 million votes that Marcos Jr. secured in the last presidential election, had the potential to translate to strong support for his vision of nuclear energy revival.<sup>455</sup> This included a possible restart of the BNPP or the use of small modular reactors that were easier to construct. Such scenario was becoming more plausible given Marcos Jr.'s intention to amend the 2001 EPIRA,<sup>456</sup> which would then potentially allow the government to operate the mothballed

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<sup>453</sup> Presentation by Sharon Ocampo-Montañer, Director of Market Operations Service of the Energy Regulatory Commission, in an online panel discussion titled *BW Insights: "The Philippines' Energy Transition Roadmap"*, organised by the Business World on 24 August 2022. Retrieved from Youtube: <https://www.youtube.com/watch?v=4pUNnvlffw>

<sup>454</sup> Presentation by Michael O. Sinocruz, OIC-Director of the Energy Policy and Planning Bureau, Department of Energy, in an online panel discussion titled *BW Insights: "The Philippines' Energy Transition Roadmap"*, organised by the Business World on 24 August 2022. Retrieved from Youtube: <https://www.youtube.com/watch?v=4pUNnvlffw>

<sup>455</sup> Caraos, D. M. Interview. 2023.

<sup>456</sup> Cordero, T. (2022, May 26). *Marcos Mulls Amending EPIRA to Bring Down Electricity Prices*. GMA News Online. Retrieved from: [https://www.gmanetwork.com/news/money/economy/832955/marcos-mulls-amending-epira-to-bring-down-electricity-prices/story/#goog\\_rewarded](https://www.gmanetwork.com/news/money/economy/832955/marcos-mulls-amending-epira-to-bring-down-electricity-prices/story/#goog_rewarded)

BNPP if it were to be revived in the future.<sup>457</sup> The potential benefits of amending the 2001 EPIRA for nuclear energy development were also evident from the support of Senator Mr Mark Cojuangco, the current Chair of the Philippine House Committee on Nuclear Energy.<sup>458</sup>

The momentum for low-carbon energy transition was likewise picked up by Senator Mr Sherwin Gatchalian who, in an effort to ensure that the incremental change in the energy sector would stand through leadership changes, introduced a draft bill on Energy Transition in the First Regular Session of the Nineteenth Congress of the Republic of the Philippines in 2022.<sup>459</sup> Among other things, the proposed bill envisioned the elimination of fossil fuel power plants and internal combustion engine vehicles from the country.<sup>460</sup> While such bill will potentially put an end to the country's technology-neutral approach, its effectiveness in achieving the intended outcomes remained uncertain as the draft bill was still under deliberation at the time of this dissertation writing.

In the private sector, there was a noticeable, albeit gradual, shift toward low-carbon energy sources. Companies like the Aboitiz Power Corporation, the San Miguel Power Corporation and the First Gen Power Corporation, which collectively made up about 60 percent of the country's electricity generation,<sup>461</sup> were diversifying their power generation portfolios to include more renewable energy sources. For example, the Aboitiz Power Corporation's installed capacity in 2017 was composed of 47 percent geothermal and 32 percent coal, and despite the company only beginning to incorporate small-scale renewable energy sources such as solar and biomass in

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<sup>457</sup> Caraos, D. M. Interview. 2023.

<sup>458</sup> House of Representatives of the Republic of the Philippines. (2022, August 22). *Solons Support Oversight over ERC, Amendment of EPIRA*. Retrieved from <https://www.congress.gov.ph/photojournal/zoom.php?photoid=3771>

<sup>459</sup> Layug Jr., J. M. Interview. 2023.

<sup>460</sup> Senate and House of Representatives of the Philippines in Congress. (n.d.). *Draft - An Act Providing For a National Energy Policy and Framework for a Clean and Just Energy Transition in the Country, and Appropriating Funds Therefor*. Retrieved from <http://legacy.senate.gov.ph/lisdata/3786534306!.pdf>

<sup>461</sup> DOE. *37th Electric Power Industry Reform Act (EPIRA) Implementation Status Report (For the Report Period October 2020)*.

2016,<sup>462</sup> the company's 2020 annual report revealed plans to increase its clean energy share to 50 percent by 2029.<sup>463</sup> Similarly, the San Miguel Corporation Global Power, which used natural gas, coal, and hydropower to generate electricity by 2018,<sup>464</sup> had since adopted battery energy storage systems and planned to develop solar power capacity, in addition to further expanding hydroelectric.<sup>465</sup>

The same trend was observed with the First Gen Power Corporation, which used nearly 95 percent coal and 5.8 percent geothermal in its installed capacity in 2017, with minimal contribution from other renewable sources.<sup>466</sup> However, in 2016, the company decided to abandon coal power.<sup>467</sup> By 2019, the company branded itself “a leading clean, renewable and low-carbon power producer,” reporting a generation capacity comprising 1.5 percent wind power, 0.1 percent solar power, and 1.8 percent hydropower on top of 62.2 percent natural gas and 34.4 percent geothermal.<sup>468</sup> This demonstrates the company's progress in integrating more renewable energy sources in its power generation portfolio.

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<sup>462</sup> Saculsan and Mori. *Why Developing Countries Go through an Unsustainable Energy Transition Pathway?*

<sup>463</sup> Aboitiz Equity Ventures. (2020). *Guided by Values for a Sustainable Future: 2019 Consolidated Annual and Sustainability Report*. Retrieved from <https://aboitizpower.com/wp-content/uploads/1-AEV-Annual-Report-2019-Reduced-File-Size-Spread.pdf>

<sup>464</sup> SMC Global Power. (n.d.a). *We Care: 2018 Sustainability Report*. Mandaluyong City: SMC Global Power. Retrieved from [https://smcglobalpower.com.ph/storage/files/reports/Sustainability%20Report/SMCGP\\_2018\\_Sustainability\\_Report.pdf](https://smcglobalpower.com.ph/storage/files/reports/Sustainability%20Report/SMCGP_2018_Sustainability_Report.pdf)

<sup>465</sup> SMC Global Power. (n.d.b). *We Rise: 2019-2020 Sustainability Report*. Mandaluyong City: SMC Global Power. Metro Manila: SMC Global Power. Retrieved from <https://smcglobalpower.com.ph/storage/files/reports/Sustainability%20Report/smgp-2019-2020-sustainability-reportpdf.pdf>

<sup>466</sup> Saculsan and Mori. *Why Developing Countries Go through an Unsustainable Energy Transition Pathway?*

<sup>467</sup> Fuentes, A., and Rodriguez, B. (2020, November 23). ‘No Regrets’ in Ditching Coal for Clean Energy, Says First Gen CEO. Retrieved from ABS-CBN News: <https://news.abs-cbn.com/business/11/23/20/no-regrets-in-ditching-coal-for-clean-energy-says-first-gen-ceo>

<sup>468</sup> First Gen Corporation. (2019). *Forging Collaborative Pathways for a Decarbonized and Regenerative Future: 2019 Integrated Report*. Retrieved from <https://www.firstgen.com.ph/static-assets/assets/file-uploads/investor-relations/reports-and-presentations/reports/First-Gen-2019-Integrated-Report-w-GRI-Mark-Final.pdf>

While *State relation with the private sector* had created a conducive environment for the Philippines to embark on a low-carbon energy transition, the extent to which renewable energy sources can replace fossil fuels will depend on factors such as future technological advancements, associated costs and public acceptance. At the time of this dissertation writing, it is apparent that eliminating coal completely is not feasible as it continues to be a reliable, available, and sufficient energy source.<sup>469</sup> Given energy security imperative, renewable energy is unlikely to replace coal entirely as long as coal retains its competitiveness in terms of availability and performance.<sup>470</sup> Additionally, despite environmentalists' objections,<sup>471</sup> the use of natural gas as a bridge fuel is inevitable considering that the Philippines still needs a reliable and sufficient energy supply for the economy.<sup>472</sup> Moreover, the country's high electricity tariff remained an important consideration, and going 100 percent renewable energy will make electricity prices prohibitively expensive.

In this regard, the country will have to contend with public acceptance until such time when the use of fossil fuels is significantly minimised. The challenge with public acceptance will likewise be evident in the potential adoption of nuclear energy source, which the Philippines was considering alongside other emerging technologies such as hydrogen, ammonia, and the CCUS, to create an optimal energy mix.<sup>473</sup> While a 2019 perception survey showed that 70 percent of respondents supported the use of nuclear energy, it remained a controversial option. Despite government efforts to raise awareness through education campaigns by the Department of Energy, on-site visits to the BNPP, and online seminars to various stakeholders including the private sector, schools, colleges and universities,<sup>474</sup> concerns persisted regarding the safety and security of

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<sup>469</sup> Habitan, A. P. Interview. 2023.

<sup>470</sup> REMB senior official. Interview. 2023.

<sup>471</sup> Pulido III, L. J. Presentation. 2022.

<sup>472</sup> Sinocruz, M. O. Presentation. 2022.

<sup>473</sup> Sinocruz, M. O. Presentation. 2022.

<sup>474</sup> Caraos, D. M. Interview. 2023.

nuclear power. Additionally, there was apprehension about increased dependence on other countries, as nuclear technology and fuel will have to be imported.<sup>475</sup>

While the State was central in the adoption and implementation of the low-carbon energy transition agenda, public opinions, particularly from the CSOs, also had some role to play given their strong advocacy for climate-related issues. For instance, leading up to the 2016 presidential election, various CSOs united under the Green Thumb Coalition to promote environmental problems as key electoral issues.<sup>476</sup> This coalition managed to collect signatures from 10 million voters nationwide,<sup>477</sup> highlighting the significant influence of environmental concerns, including renewable energy development, on the country's elections at that time. Among other issues, CSO activism had been targeting the country's technology neutral approach.<sup>478</sup>

Aside from confrontational tactics, some CSOs opted for collaborations with the government, believing that mere protests without viable solutions were ineffective given that what was needed was a relationship that checked and balanced and supported the government., as exemplified by the Institute for Climate and Sustainable Cities (ICSC) which engaged in consultations to advocate for the abolition of the pass-through arrangement and influencing policy change along that direction accordingly. <sup>479</sup>

The Department of Energy indeed provided an avenue for interactions with the CSOs through the “whole-of-nation” approach which involved multi-sectoral stakeholders, including CSOs, and facilitated public consultations, where stakeholders were encouraged to actively participate in

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<sup>475</sup> Constantino, R. R. B. Interview. 2023.

<sup>476</sup> Greenpeace Philippines. (2016, February 5). *Green Thumb Coalition Dares Candidates to Bare Their Platforms for the Environment*. Greenpeace. Retrieved from <https://www.greenpeace.org/philippines/press/1108/green-thumb-coalition-dares-candidates-to-bare-their-platforms-for-the-environment/>

<sup>477</sup> Interview with Raphael Lopez, Head of Green Thumb Coalition and Project Coordinator of Health Care without Harm-Asia, 15 January 2021.

<sup>478</sup> Interview with Mitzi Jonelle Tan, International Spokesperson of the Youth Advocates for Climate Action Philippines based in Manila, 20 January 2021.

<sup>479</sup> Constantino, R. R. B. Interview. 2023.

decision-making processes and contributed to formulating measures and strategies for achieving the country's energy agenda.<sup>480</sup> An illustrative partnership with CSOs involved transforming them into training institutions that collaborated with the Department of Energy to implement energy efficiency schemes, thereby strengthening energy efficiency measures.<sup>481</sup>

While CSOs were generally free to communicate their aspirations to the government, the influence of CSO activism on the private sector was far less significant. Except for rare cases that resulted in the cancellation of a geothermal project due to CSO protests,<sup>482</sup> company businesses were largely unaffected by CSO agendas. For example, Aboitiz Power Corp maintained a significant share of coal in its portfolio despite CSO opposition. The company justified its continued coal use by presenting a choice between two options: to continue using fossil fuels while gradually phasing them out to avoid brownouts and support ongoing economic activities and growth, or to shift immediately to renewable energy sources, risking brownouts and negative repercussions on the economy.<sup>483</sup>

Ms Maranan from ACEN echoed that CSO activism did not significantly impact the company's business, particularly given ACEN's renewable energy generation portfolio and its alignment with global targets such as the 1.5 degree goal of the 2015 Paris Agreement.<sup>484</sup> Potential objections from the CSOs, such as concerns about poor visual quality and disrupted ecosystems from wind power projects, were pro-actively managed through risk assessments conducted before project commencements.<sup>485</sup>

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<sup>480</sup> The Philippine Department of Energy official. Interview. 2023.

<sup>481</sup> Habitan, A. P. Interview. 2023.

<sup>482</sup> REMB senior official. Interview. 2023.

<sup>483</sup> Aboitiz Power Corporation senior staff. Interview. 2023.

<sup>484</sup> Maranan, I. Interview. 2023; 1.5 degree goal of the COP21 refers to the target of limiting global warming to 1.5°C above pre-industrial levels at the end of the century, which was agreed at the COP21 in 2015.

<sup>485</sup> Maranan, I. Interview. 2023.

At this stage, the significant expansion in renewable energy and the gradual reduction in coal use signaled that the Philippines has entered the early phase of low-carbon energy transition. While the transition to low-carbon sources has begun, the next steps are likely to witness some tension over possible use of nuclear energy, continued use on fossil fuels, and private sector interests. Despite these challenges, the country's shift towards low-carbon energy sources remains promising, driven by State's strong commitment to maximise the country's renewable energy potential. This is reflected in the offer made in the third round of the GEA in August 2024, which aimed to incentivise the private sector to commit to developing approximately 4,400 MW of less popular renewable energy sources, such as geothermal and hydropower.<sup>486</sup>

### 3.8. Summary

This chapter examines the evolution of the Philippine energy sector from the post-1946 independence era to the contemporary period. Applying historical institutionalism principles, it examines how critical junctures, path dependency, and incremental changes have shaped *State involvement in the energy sector* and *State relation with the private sector* in the specific industry in the energy sector, and influenced the country's energy policies and use of energy sources, leading to the ongoing progress in developing renewable energy sources.

The beginnings of the Philippine energy sector during the colonial era were characterised by the involvement of both the private sector and the State. In general, the private sector played a leading role in oil production and electricity generation whereas the State, through state-owned NPC, focused more on hydropower development. The *State relation with the private sector* was thus complementary. The rapid expansion of private electricity companies at the time suggested a

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<sup>486</sup> DOE. (2024, February 12). *DOE to Conduct GEA-3 This Year*. Retrieved from <https://doe.gov.ph/press-releases/doe-conduct-gea-3-year>

thriving business environment where the private sector had considerable autonomy in making their business decisions.

*State relation with and the private sector*, particularly the American companies, was tested during Manuel Quezon's presidency when he attempted to limit American dominance and encourage Filipino participation in the sector following the passage of the 1935 Constitution. Empowered by the provisions in the Constitution, the power *relation between the State and the private sector*, especially American companies, thus tilted towards the former. This did not last long, however, because the country's independence inadvertently re-established, and even strengthened, the prominence of American companies in the energy sector, after the passage of the 1946 Bell Trade Act. The country's independence, which potentially served as a critical juncture in the energy sector, turned out to be a near-miss.

The State's intention to continue with oil exploration and usage was clearly demonstrated in the expressed need for continuing American capital and technology in the oil sector, which was partly used to justify the amendment of the 1935 Constitution that gave way to the passage of the 1946 Bell Trade Act. While oil use continued, the State also continued with hydropower development. Despite some dynamics in the relation between the State and the American companies, the establishment of a path dependence along the use of oil and hydropower, which already started during the colonial era, was observed. The persistence of power relation that was tilted towards the private sector, especially in view of the involvement of Filipino oligarchs, was likewise demonstrated in the relation between the State and Meralco, which witnessed Meralco's continuing business expansion despite State interventions.

The private sector's dominance in the energy sector was disrupted during Marcos' Martial Law era. The 1973 global oil crisis that happened during his authoritarian rule was responded to by the nationalisation of private companies and the establishment of State's absolute control in the sector. This marked a critical juncture given that fundamentally changed *State involvement in the*

*sector and its relation with the private companies*, and effectively placed the energy sector under the influence of State's strategic agendas, which were to reduce oil import dependence through domestic energy diversification. The policy to let foreign oil companies continue their operations was part of such strategic agendas. The resultant effects on energy policies were clear: the country was able to reduce oil imports, expand its domestic coal production despite low quality, constructed its first nuclear power plant, and significantly expanded its geothermal outputs. The Philippines' energy diversification efforts were therefore relatively successful during Marcos authoritarian era.

The critical juncture brought about by Marcos-era policies had the potential to turn into a path dependence. This did not happen, however, because his successor President Corazon Aquino reversed many of Marcos-era policies including by re-privatising the energy sector. This marked yet another critical juncture in the country's energy sector although the process of re-privatisation of the electricity industry only completed about a decade later with the passage of the EPIRA in 2001. The re-privatisation marked a reversal back to a configuration that had long been established before the Marcos era; one that was arguably more preferred by the wider society as evident in the strong support received in post-Marcos' re-privatisation attempts.

A parallel development to the re-privatisation initiatives was the adoption of the global climate agenda and the State's response through measures such as the establishment of the Inter Agency Committee on Climate Change in 1991. Although the energy sector was not yet subject to climate mitigation imperatives, such responses set the stage for its eventual exposure. The energy diversification attempts that began during Marcos' presidency continued to the subsequent administrations, as evident in Ramos-era's policy to pursue the development newer types of energy such as solar and wind.

The 2001 EPIRA and the re-privatisation of electricity provisions fundamentally changed *State involvement in the sector* and re-defined *State relation with the private sector*, from one that was

completely controlled by the State to one that was predominantly run by the private sector. This transformation came with a change in power relation between the two, and established a dependent *relationship between the State and the private sector*. This type of relationship thus necessitated the State to meet the private sector's interests to ensure the provision of electricity in the country. The 2008 Renewable Energy Act reflected this dynamic, as it was designed to incentivise the private sector to venture into renewable energy businesses during the time when market forces were not yet in favour of their expansion. The passage of the 2008 Renewable Energy Act concurrently demonstrated the State's determination to pursue the agenda although it did not necessarily mean an intention to transition away from fossil fuels.

State's intention to utilise the country's renewable energy sources received stronger justification in parallel with the progress in the country's responses to global climate processes that were observed in the passage of the Climate Change Act in 2009, among others. The convergence between the State's agenda and determination to develop renewable energy sources and the private sector's enthusiastic responses to incentives provided for by the 2008 Renewable Energy Act had indeed resulted in considerable expansion of renewable energy sources in the country. In recent years, electricity companies have begun to reduce their reliance on coal, thereby signifying the start of low-carbon energy transition in the country.

While the progress indeed seemed promising, the trajectory ahead remains uncertain given the country's high dependence on the private sector that could potentially become a stumbling block in view of their for-profit interests. This concern was already evident in their reluctance to commit to geothermal and hydropower projects given their high risks and lack of financial viability. Additionally, the country's technology-neutral approach may also mean continuing simultaneous development of renewable energy and fossil fuels moving forward unless the draft bill on Energy Transition is successfully passed and effectively stops fossil fuel use in the country.

## Chapter 4

### Tracing Indonesia's Pathway to Low-Carbon Energy Transition

#### 4.1. Introduction

Like the Philippines, the evolution of Indonesia's energy sector trajectory entails complex processes involving the State and the private sector. Applying historical institutionalism, this chapter investigates how critical juncture, path dependence and incremental changes affected *State involvement in the energy sector* and *State relation with the private sector* in specific industry in the energy sector.

To enable a thorough process-tracing, this chapter begins by landscaping the beginnings of the country's energy sector during the Dutch colonial period. The focus is on identifying the roles of the State (represented by the Dutch colonial rulers) and the private sector in the energy sector, establishing their relation, and examining the choice and use of energy sources at the time.

Thereafter, the chapter applies historical institutionalism concepts to examine the evolution of *State involvement in the energy sector* and *State relation with the private sector* and their effects on the transformation of energy policies within four periods of analysis, namely: post-1945 independence era, Soeharto's authoritarian era, the early Reform era, and the renewable energy development era.

Following the analysis, the chapter then discusses Indonesia's low-carbon energy transition progress.

## 4.2. The Founding of Indonesia's Energy Sector (late 19<sup>th</sup> century to mid-1940s)

The development of Indonesia's energy sector began in the late 19<sup>th</sup> century during the Dutch colonial era. Indonesia was called the Dutch East Indies at the time. The situation of the Dutch colonial era was characterised by the control and exploitation of the Indonesian natural resources for the benefits of the Netherlands' economic development.<sup>487</sup> The private entities taking part in the economic activities were mainly Dutch.

Following the advent of the modern oil industry at the global level in 1859, private oil companies that had obtained concessions from the Dutch colonial ruler began their exploration and exploitation activities in Indonesia. Among the major players was the Royal Dutch company. The Royal Dutch extracted the first crude oil at Telaga Said in the east coast of Sumatra Island on 28 February 1892.<sup>488</sup> Following Telaga Said, many oil fields were found. These included, among others, in Sanga Sanga, East Kalimantan in 1887, in Muara Enim, South Sumatra in 1889, in Surabaya, East Java in 1890, in Palembang, South Sumatra in 1897, in Perlak, Aceh in 1900, and in Ledok, Central Java in 1901, leading to the establishment of eighteen big and small corporations doing oil businesses in Indonesia in the second half of the 19<sup>th</sup> century.<sup>489</sup>

The system was concession-based. In addition to Royal Dutch, Shell was another major player. The two merged on 24 February 1907 and assumed a new name Koninklijke Shell Groep (Royal Dutch Shell Group) that subsequently was referred to as Shell. Shell became the single largest oil company in the Dutch East Indies, having concessions in Delta Mahakam and Tarakan in East Kalimantan, North Sumatra, Pangkalan Brandan and Rantau in Aceh, Muara Enim in South

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<sup>487</sup> Barnes, P. (1995). *Indonesia, The Political Economy of Energy*. New York: Oxford Institute for Energy Studies.

<sup>488</sup> Jonker, J., and van Zanden, J. L. (2007). *From Challenger to Joint Industry Leader, 1890-1939: A History of Royal Dutch Shell*. Oxford: Oxford University Press.

<sup>489</sup> Darmono, D. (2009). Pertambangan di Masa Penjajahan. In *Mineral dan Energi Kekayaan Bangsa: Sejarah Pertambangan dan Energi Indonesia*. Jakarta: Departemen Energi dan Sumber Daya Mineral, pp. 66 – 84.

Sumatra, Cepu in Central Java, and Surabaya and Wonokromo in East Java, as well as oil refineries in Pangkalan Brandan in North Sumatra, Plaju in South Sumatra, Cepu in Central Java, Wonokromo in East Java and Balikpapan in East Kalimantan.

Indonesia's early oil industry was characterised by significant State intervention despite the private sector playing an important role as the operator. At the beginning, the Dutch colonial administration sought to protect the market by favouring Dutch companies and blocking other foreign entities, including American firms, from operating in Indonesia.<sup>490</sup> However, this stance shifted in the 1920s following the passage of the General Leasing Act in the United States that prohibited land leasing to non-U.S. companies whose home countries discriminated against American businesses. The Dutch discriminatory policies against American companies in Indonesia backfired under this act, affecting Shell's operations in the U.S. Consequently, the Dutch colonial authorities were compelled to relax their regulations and permit American oil companies such as Standard Vacuum Petroleum Maatschappij (Stanvac) and California Texas Oil Company (Caltex) to enter Indonesia.

Since the start of its exploration, oil production had been intended primarily for export. The emphasis on exports underscored its high economic value. Around 66 percent of the oil produced was allocated for export while about 38 percent used for domestic consumption in 1921, as indicated in Table 4.1 below.<sup>491</sup> By the late 19<sup>th</sup> century, oil had become increasingly essential in various sectors including industry, transportation, household, and electricity generation, leading to a significant growth rate averaging 10.14 percent between 1893 and 1939.<sup>492</sup>

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<sup>490</sup> Darmono. *Pertambangan di Masa Penjajahan*.

<sup>491</sup> (1924, April). Petroleum Production and Trade of the Dutch East Indies. *The Far Eastern Review*, 183 – 186.

<sup>492</sup> Darmono. *Pertambangan di Masa Penjajahan*.

**Table 4. 1: Petroleum Trade in 1921**

	<b>Quantity (Million Gallons)</b>
Local production	714
Import	33
Export	473
Local consumption	274

*Source: (1924, April). Petroleum Production and Trade of the Dutch East Indies.*

In addition to oil, Indonesia was endowed with huge coal reserves, with coal production primarily performed by the Dutch colonial government rather than the private sector, beginning in the second half of the 19<sup>th</sup> century the Ombilin field in West Sumatra starting production in 1892 and the Bukit Asam field in South Sumatra following in 1919, together accounting for approximately 64 percent of total coal production in Indonesia.<sup>493</sup> From the early 1900s to 1940, the country's coal output surged from about 200,000 metric to 2 million metric tons, with 30 percent earmarked for export.<sup>494</sup> Thus, like oil, coal was an important commodity to generate income.

Among other applications, coal was used to produce electricity, powering streetlights in big cities like Jakarta and Surabaya using gas produced from coal, and supported self-sufficiency in the coal industry as evidenced in the construction of Kampung Durian steam power plant in 1912 along the Batang Arau River in West Sumatra by Sumatra Staats Spoorwegen (SSS), or Sumatra State Railways, to electrify railways essential for transporting coal to Emmahaven (Telukbayur) harbour.<sup>495</sup>

Similar to oil and coal, the production of electricity in Indonesia began in the late 19<sup>th</sup> century, mainly by the private sector. The Netherlands Indies Electricity Company (Nederlandsch-Indisch

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<sup>493</sup> Darmono. *Pertambangan di Masa Penjajahan*.

<sup>494</sup> Ooi, J. B. (1984). Indonesia's Energy Transitions. *Applied Geography*, 4, 187 – 200.

<sup>495</sup> Darmono. *Pertambangan di Masa Penjajahan*.

Electriciteit Maatschappij/NIEM) was the first private company to generate electricity in Jakarta in 1897, followed by other private corporations such as the Netherlands Indies Gas Company (Nederlandsch-Indisch Gas-Maatschappij/NIGM) and the Netherlands Indies General Electricity Company (Algemeene Nederlandsch-Indische Electriciteit Maatschappij/ANIEM), leading to a more than ten times increase in installed capacity by private companies between 1914 and 1940.<sup>496</sup>

In addition to the private enterprises, many plantations and factories also generated their own electricity and sold surplus power to the local population. The colonial government was not initially involved in the electricity sector except for some small municipal power plants. In 1910, however, the colonial government began to show interest in electricity generation, creating a distinct division between the colonial government and the private sector on the utilisation and development of energy sources, with the former operating hydropower plants and the latter relying heavily on fossil fuels for power generation.<sup>497</sup>

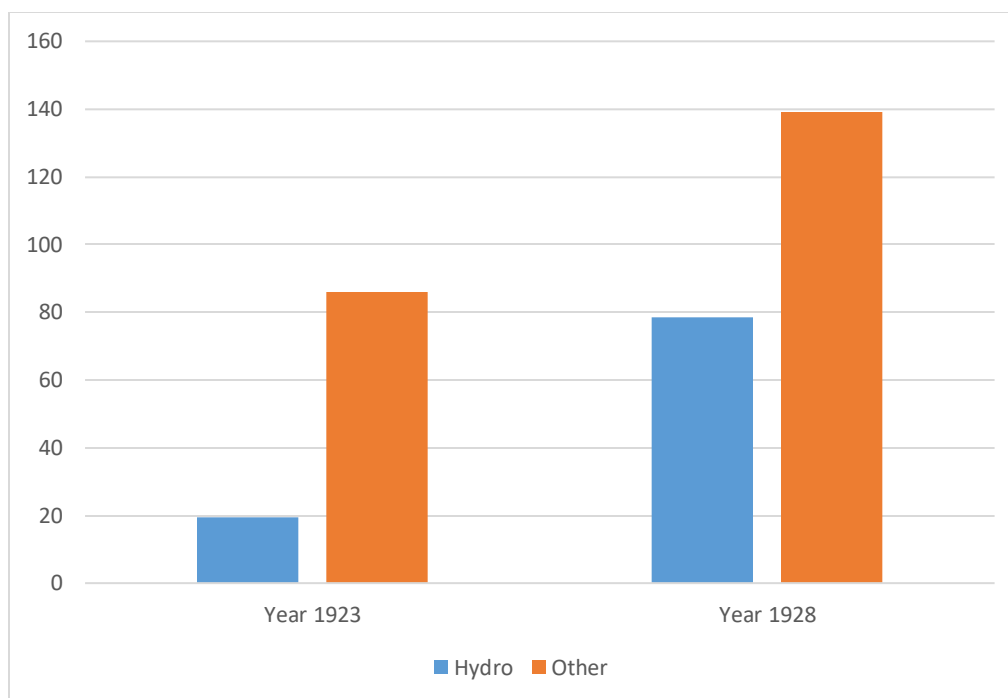
Overall, in the early years of electricity generation, non-hydropower sources such as coal and diesel made a larger contribution compared to hydropower, as depicted in Figure 4.1 below.

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<sup>496</sup> McCawley, P. (1971). *The Indonesian Electricity Supply Industry*. PhD dissertation, Australian National University.

<sup>497</sup> McCawley. *The Indonesian Electricity Supply Industry*.

**Figure 4. 1: Total Installed Capacities in Years 1923 and 1928 (in MW)**



Sources: Division of Commerce of the Department of Agriculture, Industry and Commerce. (1924). *Handbook of the Netherlands East-Indies*. Batavia: G. Kolff [for the 1923 data], and Division of Commerce of the Department of Agriculture, Industry and Commerce. (1930). *Handbook of the Netherlands East-Indies*. Batavia: G. Kolff [for the 1928 data]; both quoted in McCawley, P. (1971). *The Indonesian Electricity Supply Industry*. PhD dissertation, Australian National University.

Private companies were initially involved in hydropower, but by 1915, the colonial government became alarmed at what it perceived as uncontrolled use of hydropower by the private sector.<sup>498</sup> In August 1917, the colonial government established the Service for Waterpower and Electricity to regulate the issuance of permit for new power plants, among other mandates. The colonial government maintained complete control over the exploration survey of development of hydropower capacity,<sup>499</sup> which was estimated to reach 6.6 million horsepower.<sup>500</sup> Like in the oil industry, the dynamics in the hydropower industry again reflected the State's interventionist character.

<sup>498</sup> McCawley. *The Indonesian Electricity Supply Industry*.

<sup>499</sup> (1933, August). Water Power in the Dutch East Indies. *The Far Eastern Review*, 344.

<sup>500</sup> *Water Power in the Dutch East Indies*.

The foundation of Indonesia's energy sector was thus significantly shaped by the economic value of its abundant mineral resources, most notably oil and coal. Both the State and the private sector were actively engaged, with distinct roles: the State focused on coal mining and hydropower development, while the private sector concentrated on oil exploration and non-hydropower sources. The concurrent expansion of hydropower and non-hydropower facilities reflected an effort to ensure energy supply in response to increasing energy demand. The strategic importance of the energy sector, driven by its economic value, led to significant State involvement and occasional interventions in oil and hydropower development, thereby shaping private sector participation. It is apparent, therefore, that the State wielded considerable influence in the sector. This was the general landscape of the Indonesia's energy sector by the time the country gained independence in 1945.

#### 4.3. Nationalisation of Energy Sector in Post-Independence Era (1945 to 1968)

Indonesia gained its independence from the Dutch colonial ruler on 17 August 1945. Having experienced the trauma of colonialism and the exploitation of Indonesia's natural resources for the benefits of the colonial rulers, Indonesia's first President Soekarno espoused a strong anti-colonial and anti-imperial stance in his political agenda. Under Soekarno leadership, the mining sector was governed with nationalistic fervour.<sup>501</sup> It was a sentiment shared nationwide in the newly independent country, which was manifested in Article 33(2) of the 1945 Constitution of the Republic of Indonesia that said "Production sectors that are important for the country and affect the life of the people shall be under the powers of the State", and Article 33(3) that says "The land, the waters and the natural resources within [Indonesia] shall be under the powers of the State

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<sup>501</sup> Barnes. *Indonesia, The Political Economy of Energy*.

and shall be used to the greatest benefit of the people.”<sup>502</sup> These articles laid the foundation for the role of the State in the mining and electricity industries in Indonesia.

The events leading up to Indonesia’s independence were instrumental in shaping the nationalistic orientation of the energy sector. During the Japanese occupation from 1942 to 1945, many businesses abandoned by the Dutch and Americans, including those in mining and electricity generation, were seized. All generating plants and electricity companies previously owned by the central government, municipal councils, and private-owned utilities were consolidated into a single entity called the Java Electricity Company (Djawa Denki Djigyo Kosha).<sup>503</sup>

Similar to the Dutch colonial rulers, the Japanese exploited Indonesia’s resources for their own gains. During their occupation, mining and mineral resources played a vital role in supporting Japan’s Greater East Asia War.<sup>504</sup> The long oppression under different colonial rulers and their exploitative treatments of Indonesia’s natural resources galvanised some labour unions in the energy industry to transform into paramilitary groups. These included the Indonesian Militia Group of Electricity and Gas Workers (Laskar Buruh Listrik dan Gas Indonesia), the Indonesian Young Generation of Electricity and Gas (Angkatan Muda Listrik dan Gas Indonesia),<sup>505</sup> and the Oil Militia Group (Laskar Minyak)<sup>506</sup>

Recognising their strategic importance, the paramilitary movement seized electricity and gas installations on 29 September 1945, and to prevent these infrastructures from being re-captured by returning Dutch force, they destroyed several facilities, including the Lamajang hydropower

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<sup>502</sup> DPR (Dewan Perwakilan Rakyat). (n.d.). *Undang-Undang Dasar 1945*. Retrieved from <https://www.dpr.go.id/jdih/uu1945>

<sup>503</sup> McCawley. *The Indonesian Electricity Supply Industry*.

<sup>504</sup> Sato, S. (1994). *War, Nationalism and Peasant: Java Under the Japanese Occupation 1942-1945*. St Leonards: Asian Studies Association of Australia.

<sup>505</sup> Sambodo, M. T. (2016). *From Darkness to Light: Energy Security Assessment in Indonesia’s Power Sector*. Singapore: ISEAS Yusof Ishak House.

<sup>506</sup> Yusgiantoro, P. (2021). *Rekam Jejak Dua Periode ESDM: Menguak Masa Transisi 2000-2009, 2<sup>nd</sup> Edition*. Jakarta: Yayasan Purnomo Yusgiantoro.

plant, central Java transmission poles, Kanigaran substations, Mendalan hydropower plant, and Siman hydropower plant.<sup>507</sup>

The nationalistic undertone embedded in the energy and electricity sector laid the foundation for the State to nationalise Dutch electricity enterprise, a process that spanned approximately ten years from 1950 to 1960. In November 1951, a parliamentary committee proposed the nationalisation of all public utilities, starting with the Overseas Gas and Electricity Company (Overzeese Gasen Electriciteits-Maatschappij/OGEM).<sup>508</sup> In December 1951, the government established the Commission for the Nationalisation of Electricity and Gas Companies, which, after a year of evaluation, recommended the nationalisation of all the Dutch electricity companies.<sup>509</sup>

In October 1953, President Soekarno issued Presidential Decree No. 163, mandating the nationalisation of foreign-owned electricity companies upon the expiration of their concessions.<sup>510</sup> In January 1958, the administration of Dutch-owned electricity and gas enterprises was transferred to the Minister of Public Affairs.<sup>511</sup> President Soekarno subsequently issued Regulation No. 23/1958, stating that all Dutch enterprises were now under the Indonesian administration. The government set up the Central Administering Board for Electricity and Gas Enterprises (Pusat Penguasa Perusahaan Listrik dan Gas/P3LG) to coordinate these companies.<sup>512</sup> The P3LG was eventually dissolved, and the Power Department (Jawatan Tenaga) was converted into state-owned National Electricity Company (Perusahaan Listrik Negara/PLN),<sup>513</sup> which is still in operation until today at the time of this dissertation writing.

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<sup>507</sup> McCawley. *The Indonesian Electricity Supply Industry*.

<sup>508</sup> Sambodo. *From Darkness to Light: Energy Security Assessment in Indonesia's Power Sector*.

<sup>509</sup> McCawley. *The Indonesian Electric Supply Industry*.

<sup>510</sup> Sambodo. *From Darkness to Light: Energy Security Assessment in Indonesia's Power Sector*.

<sup>511</sup> McCawley. *The Indonesian Electric Supply Industry*.

<sup>512</sup> Sambodo. *From Darkness to Light: Energy Security Assessment in Indonesia's Power Sector*.

<sup>513</sup> DPE (Departemen Pertambangan dan Energi). (2000). *55 Years of Mining and Energy Development*. Jakarta: DPE.

The government subsequently issued Regulation No. 3/1959 to establish the Board of the Nationalisation of Dutch Enterprises (Badan Nasionalisasi Perusahaan Belanda or BANAS), and Regulation No. 18/1959 to nationalise Dutch-owned electricity and gas enterprises, completing the nationalisation process by the early 1960s, at which point state-owned PLN had gained total control of the electricity industry.<sup>514</sup>

A similar phenomenon was observed in the oil industry. After independence, the American oil company Caltex returned to Indonesia's Central Sumatra in 1949, but subsequently encountered concession problems.<sup>515</sup> On 2 August 1951, the Parliament encouraged the government to establish a commission to investigate oil and mining activities.<sup>516</sup> In 1957, the Parliament froze all new concessions.<sup>517</sup> In 1960, President Soekarno signed the Oil and Mining Law No. 44, mandating that "oil and natural gas mining is only conducted by the State and the State company that is authorised to engage in oil mining on behalf of the State," which the Parliament ratified the following year.<sup>518</sup>

Despite the State's tightening grip, the Soekarno administration eventually still allowed foreign oil companies to operate, though not without difficult negotiations. A memorandum from a staff member of the United States National Security Council to President Kennedy reported that American companies "had been negotiating fruitlessly with the Indonesian Government for two and one half years," prompting the involvement of the American government in the mediation process.<sup>519</sup> In 1963, the Indonesian government reached an agreement with American oil companies Stanvac, Caltex and Panam, and Shell to replace their existing concessions with work

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<sup>514</sup> Sambodo. *From Darkness to Light: Energy Security Assessment in Indonesia's Power Sector*.

<sup>515</sup> Muliadiredja, E. P. (2005). *Indonesian Energy Policy Pathways: From Past Trends to Future Alternatives*. PhD dissertation, Massey University.

<sup>516</sup> Carlson, S. (1977). *Indonesia's Oil*. Boulder, Colorado: Westview Press, Inc., p. 11.

<sup>517</sup> Ooi, J. B. (1982). *The Petroleum Resources of Indonesia*. Kuala Lumpur: Oxford University Press, p. 9.

<sup>518</sup> Carlson. *Indonesia's Oil*, 12.

<sup>519</sup> Office of the Historian. (1963, June 10). *Memorandum From Michael V. Forrestal of the National Security Council Staff to President Kennedy*. Foreign Relations of the United States, 1961-1963, Volume XXIII, Southeast Asia. Retrieved from <https://history.state.gov/historicaldocuments/frus1961-63v23/d309>

contracts, which were of shorter duration and covered smaller geographical areas, while assigning state-owned companies as contractors to each of the American oil companies: State company Permina to Stanvac, State company Pertamina to Caltex and Panam, and State company Permigan to Shell.<sup>520</sup> These measures were taken to ensure that the State retain some level of control in the oil sector. The arrangement saw the country's oil production grow by 160 percent between 1957 and 1967.<sup>521</sup>

In the extractive industry, similar restrictive laws were enacted. Government Regulation in Lieu of Law No. 37 Year 1960 on Mining emphasised the role of the State in managing mining activities and required Indonesian citizenship for private sector involvement.<sup>522</sup> Additionally, Law No. 78 Year 1958 on Foreign Investments completely prohibited foreign enterprises from investing in the extractive industry.<sup>523</sup>

It is evident, therefore, that the measures introduced during Soekarno's presidency significantly altered the energy sector by deepening State involvement, reducing the scope of private sector participation's involvement in the sector, and restricting foreign involvement. These changes enabled the State to exercise a tighter control over the sector and direct it based on its strategic interests. Indonesia's independence thus marked a critical juncture, with the State laying down a new foundation for Indonesia's energy sector by establishing itself as the primary authority over energy provisions and subjecting the sector according to its strategic interests.

In terms of energy sources, the country continued to use coal, diesel and hydropower as it did during the Dutch colonial era, with hydropower having the highest share of installed capacity until

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<sup>520</sup> Carlson. *Indonesia's Oil*.

<sup>521</sup> Republic of Indonesia. (1968). *Keputusan Presiden Republik Indonesia Nomor 319 tahun 1968 tentang Rentjana Pembangunan Lima Tahun 1969/70-1973/74*.

<sup>522</sup> Republic of Indonesia. (1960, October 26). *Peraturan Pemerintah Pengganti Undang-undang (Perpu) Nomor 44 tahun 1960 (44/1960) tentang Pertambangan Minyak dan Gas Bumi*. Retrieved from <https://www.bphn.go.id/data/documents/60ppu044.pdf>

<sup>523</sup> Republic of Indonesia. (1958, October 14). *Undang-undang Republik Indonesia Nomor 78 tahun 1958 tentang Penanaman Modal Asing*. Retrieved from <https://peraturan.bpk.go.id/Home/Details/52872/uu-no-78-tahun-1958>

1969.<sup>524</sup> The country's use of coal was affected due to external factors, notably by global technological innovations that favoured the use of oil over coal. Coal was an important energy source until the 1950s,<sup>525</sup> but technological advances rendered coal-fired furnaces obsolete,<sup>526</sup> replaced coal-fired ships with oil-fired ones,<sup>527</sup> and replaced steam locomotives with diesel locomotives.<sup>528</sup> As a consequence, global and national demands for oil increased significantly while coal demands plummeted. It was during this time that coal use began to decline.

The transfer of the energy sector to the State did not result in optimum performance despite increased oil production.<sup>529</sup> The sector's lack of progress was heavily influenced by the government's priorities, which were directed by Soekarno's strategic interests. Rather than focusing on economic development, Soekarno prioritised "gun over butter," as evidenced by his emphasis on territorial matters and significant budget allocations for military operations.<sup>530</sup> His principal economic ideology, the Guided Economy (Ekonomi), which he introduced in 1959 with the aim of building a socialist economic society, ultimately failed by the end of his presidency in 1965.<sup>531</sup> Given the influence of the State's strategic interests in the energy sector, Soekarno's lack of prioritisation on economic development had negatively affected the energy sector's performance.

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<sup>524</sup> Sambodo. *From Darkness to Light: Energy Security Assessment in Indonesia's Power Sector*.

<sup>525</sup> Ooi. *Indonesia's Energy Transitions*.

<sup>526</sup> Republic of Indonesia. (1968). *Keputusan Presiden Republik Indonesia Nomor 319 tahun 1968 tentang Rentjana Pembangunan Lima Tahun 1969/70-1973/74*.

<sup>527</sup> Ooi. *Indonesia's Energy Transitions*.

<sup>528</sup> Prijono, A. and Kusuma, A. (1983). Status and Prospect of Indonesian Coal Development. *Indonesian Quarterly II*, 2, 22 – 40.

<sup>529</sup> Interview with Prof. Ir. Purnomo Yusgiantoro, M.Sc., MA, Ph.D., former minister of energy and former minister of defence, in Jakarta, 23 January 2023.

<sup>530</sup> Yusgiantoro, P. Interview. 2023.

<sup>531</sup> Tan, T. K. (1966). Indonesia's Guided Economy and Its Implementation: 1959-1965. *The Australian Quarterly*, (38)(2), 9 – 28.

#### 4.4. Energy Diversification during Soeharto's Authoritarian Era (1968 to 1998)

Soekarno's presidency ended shortly after the infamous military-led purging of the Communists following the Thirtieth of September Movement (G30S/PKI) in 1965. In 1968, Soeharto rose to power and became Indonesia's second president. His ascent to the presidency marked a significant political shift, as he established a dictatorial regime with economic performance as the key legitimising factor.<sup>532</sup> Soeharto inherited a struggling economy, a consequence of the failure of Soekarno's Guided Economy to revitalise the economy two decades after independence.<sup>533</sup> To address this, he took a radically different paradigm by relaxing Soekarno's nationalistic stance and opening the economy to greater foreign investment.

This shift was driven by pro-market Western-educated economists who shaped Indonesia's economic policies at the start of his presidency.<sup>534</sup> The liberal leaning University of California-trained economists, or known as the Berkeley Mafia,<sup>535</sup> advised Soeharto to leverage natural resources as a central strategy for economic recovery, specifically recommending that oil production and export become the cornerstone of Indonesia's economy.<sup>536</sup>

The new economic strategy affected the energy sector by reinforcing the importance of oil and establishing a path dependence on its use, while also promoting the development of other energy sources to support economic growth. This ambition was reflected in the Five-Year Development Plans (Rencana Pembangunan Lima Tahun/REPELITA), which played a crucial role in enhancing

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<sup>532</sup> Mody, N.B. (1987). *Indonesia Under Soeharto*. London: Oriental University Press.

<sup>533</sup> Lindblad, J. T. (2010, March). The Indonesian Economy in the Early Independence Period. *Itinerario*, (XXXIV)(1), 7 – 8.

<sup>534</sup> Liddle, R. W. (1991). The Relative Autonomy of the Third World Politician: Soeharto and Indonesian Economic Development in Comparative Perspective. *International Studies Quarterly*, (35)(4), 403 – 427.

<sup>535</sup> The term "Berkeley Mafia" is widely used in the literature, see for example: Smith, B. (2003). "If I Do These Things, They Will Throw Me Out": Economic Reform and the Collapse of Indonesia's New Order. *Journal of International Affairs*, (57)(1), 113 – 128.

<sup>536</sup> Yusgiantoro, P. Interview. 2023.

the production of various energy sources in Indonesia,<sup>537</sup> thereby diversifying the country's energy portfolio.

To this end, the State under Soeharto leadership enacted Law no.11 Year 1967 to allow foreign investments in the extractive industry<sup>538</sup> while maintaining state-owned PLN's monopoly in the electricity sector. The opening of the Indonesian hydrocarbon sector to foreign direct investments resulted in an increased number of foreign oil companies entering the oil and gas sector. Between 1967 and 1972, more than forty production-sharing contracts were awarded to companies from the United States, the Netherlands, the United Kingdom, Australia, Italy, France and Panama, with American companies making up of 73 percent of such contracts.<sup>539</sup>

Following this policy, Indonesia's oil production reached an all-time high. It rose six times within two decades, from about 50 million barrels in 1950 during Soekarno era to 600 million barrels in mid-1970s.<sup>540</sup> Oil production showed the highest growth at about 12 percent annually, or 200 percent increase, between 1966 and 1973.<sup>541</sup> Concurrently, oil contributions to export earnings increased from about 20 percent in 1936-1940 during the Dutch colonial time, to 47 percent in 1973, to 71 percent in 1974,<sup>542</sup> and to 80 percent in 1982.<sup>543</sup> The use of oil in transportation, industry, cooking, and lighting, also accelerated from the 1950s onwards, increasing nearly ten times between 1955 and 1970.<sup>544</sup> As a result, oil share in the domestic energy mix reached as high

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<sup>537</sup> Interview with an official at the Directorate General of New and Renewable Energy and Energy Conservation (Energi Baru Terbarukan dan Konservasi Energi/EBTKE), the Ministry of Energy and Mineral Resources of the Republic of Indonesia, in Jakarta, 25 January 2023.

<sup>538</sup> Republic of Indonesia. (1967, December 2). Undang-Undang Republik Indonesia Nomor 11 Tahun 1967 Tentang Ketentuan-Ketentuan Pokok Pertambangan. Retrieved from <https://jdih.esdm.go.id/storage/document/UU%20No.%2011%20Th%201967.pdf>

<sup>539</sup> Susanti, E., and Trilaksana, A. (2016). Penanaman Modal Asing Sektor Pertambangan Minyak dan Gas Bumi Nasional pada Masa Orde Baru Tahun 1967-1981. *AVATARA*, (4)(3): 778 – 792.

<sup>540</sup> Ooi, J. B. (1982). *The Petroleum Resources of Indonesia*.

<sup>541</sup> Republic of Indonesia. (1974). *Keputusan Presiden Republik Indonesia Nomor 11 tahun 1974 tentang Rencana Pembangunan Lima Tahun Kedua (REPELITA II) 1974/75 – 1978/79*.

<sup>542</sup> Ooi. *Indonesia's Energy Transitions*.

<sup>543</sup> McCawley, P. (1983). Survey of Recent Developments. *Bulletin of Indonesian Economic Studies*, (19)(1), 1 – 31.

<sup>544</sup> Arismunandar, A. (1972). *Energy and Energy Resources for the Future of Indonesia: Problems and Proposed Solutions*. Workshop on Natural Resources, Jakarta, September 11–16, Jakarta, Indonesia.

as 80 to 90 percent from the early 1970s to the early 1980s.<sup>545</sup> The State's focus on economic development, coupled with increased participation from the private sector and foreign investments, significantly improved the energy sector's performance compared to the lackluster results seen during Soekarno's presidency.

In addition to boosting oil production, the State under Soeharto leadership played a crucial role in reviving the dying coal sector and increasing its production significantly. Before the World War II, Indonesia's coal production reached a high of 2 million tons, but this figure slumped significantly after the war<sup>546</sup> amounting to only about 175,000 tons per year in the 1970s.<sup>547</sup> Furthermore, the dimming global coal market between the early 1960s and the 1970s<sup>548</sup> rendered maintaining collieries increasingly challenging and constrained coal production capacity further.

Despite these unfavourable conditions, the State under Soeharto leadership was determined to reinvigorate the coal sector. Efforts included rehabilitating existing colliers, maintaining existing market, and exploring new uses for coal. The sector faced a tough start, with only companies Shell Mijnbouw and Rio Tinto investing in the 1970s,<sup>549</sup> both of which eventually withdrew after finding only low-quality coal in their exploration attempts. Regardless of challenges, by the end of 1976, the Soeharto administration had affirmed that coal was to become the main source of electricity generation in the country.<sup>550</sup>

At this juncture, it is evident that the State's deep involvement in the energy sector and its strategic interests directly influenced the country's energy choices. In relation to the private sector, the

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<sup>545</sup> Ooi. *Indonesia's Energy Transitions*.

<sup>546</sup> Ooi. *Indonesia's Energy Transitions*.

<sup>547</sup> Republic of Indonesia. *Keputusan Presiden Republik Indonesia Nomor 11 tahun 1974*.

<sup>548</sup> MME (Ministry of Mines and Energy). (1995). *50 Years Mining and Energy in Development*. Jakarta: MME.

<sup>549</sup> Friederich, M.C. and van Leeuwen, T. (2017). A Review of the History of Coal Exploration, Discovery and Production in Indonesia: The Interplay of Legal Framework, Coal Geology and Exploration Strategy. *International Journal of Coal Geology*, 178, 56 – 73.

<sup>550</sup> Republic of Indonesia. (1979). *Keputusan Presiden Republik Indonesia Nomor 7 tahun 1979 tentang Rencana Pembangunan Lima Tahun Ketiga (REPELITA III) 1979/80 – 1983/84*.

State assumed a regulatory role while private companies acted as operators. This was evident in the coal contracts of work (CCoW) scheme that the Soeharto administration established to facilitate coal exploration activities. In the early 1980s, twelve foreign and domestic companies signed the first batch of CCoWs.<sup>551</sup> Subsequently, driven largely by the commissioning of Suralaya coal-fired power plant in 1984 that spurred a surge in domestic coal demand, coal production in 1983/1984 jumped by 84 percent and coal export doubled from the previous year.<sup>552</sup>

The second batch of CCoWs was awarded to seventeen domestic companies in 1994.<sup>553</sup> Three years later in 1997, the government granted the third batch of CCoWs to 114 companies, the majority of which were domestic.<sup>554</sup> This issuance of additional CCoWs from the early 1980s to the late 1990s thus underscored the government's commitment to expanding the coal sector and increasing the participation of domestic companies in the sector.

The determination to accelerate coal production was further observed in the establishment of the Coordinating Committee on Coal Development chaired by the Director General for Mining in 1985, as coal use increased in industries, especially in the productions of cement and steel, resulting in a substantial rise in coal demand that continued to grow between mid-1980s and late-1990s, amounting to a surge in coal production by 107.5 percent in 1989/1990 and by 145.6 percent in 1991/1992.<sup>555</sup> State deep involvement in the coal industry thus brought the country to

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<sup>551</sup> Friederich and van Leeuwen. *A Review of the History of Coal Exploration, Discovery and Production in Indonesia*.

<sup>552</sup> Muliadiredja. *Indonesian Energy Policy Pathways*.

<sup>553</sup> Tirtosoekotjo, S. (2000). *The Prospect of Coal Supplier for Future Coal: Major Expansion of Energy Supply/Demand in Indonesia*. Proceedings of the Sixth APEC Coal Flow Seminar, March 14–16, Kyongju, Korea.

<sup>554</sup> Lucarelli, B. (2010). *The History and Future of Indonesia's Coal Industry: Impact of Politics and Regulatory Framework on Industry Structure and Performance*. Stanford: Program on Energy and Sustainable Development. Retrieved from [https://fsi-live.s3.us-west-1.amazonaws.com/s3fs-public/WP\\_93\\_Lucarelli\\_revised\\_Oct\\_2010.pdf](https://fsi-live.s3.us-west-1.amazonaws.com/s3fs-public/WP_93_Lucarelli_revised_Oct_2010.pdf)

<sup>555</sup> Muliadiredja. *Indonesian Energy Policy Pathways*.

become the third largest thermal coal exporter by the mid-1990s and the world's largest LNG exporter by the mid-1990s.<sup>556</sup>

Overall, the extractive industry's contribution to the national economy through export and foreign exchange receipts rose significantly, from 55 percent in 1974 to 70 percent in 1979.<sup>557</sup> Such impressive development was made possible by the deep involvement of the State under Soeharto's authoritarian leadership, and its focus on economic development, which was critical in facilitating project planning and execution and ensuring compliance from all relevant stakeholders.<sup>558</sup>

The 1973 global oil shock happened against such a backdrop. Unlike many countries that felt the pinch from the price hike, Indonesia, as an oil producer, benefited greatly from the high prices.<sup>559</sup>

The emphasis on revenue generation was an important element of energy security for energy-producing and exporting countries like Indonesia.<sup>560</sup> The Soeharto administration allowed oil exports to continue while encouraging energy diversification, including by developing geothermal,<sup>561</sup> to ensure sufficient energy sources at the domestic level. The 1973 global oil crisis also led to increased foreign interest in investing in Indonesia's coal production for export purposes,<sup>562</sup> given that the global oil crisis led to growing demand for coal as oil substitute in many countries including Japan, Korea, and Taiwan.<sup>563</sup> The 1973 global oil crisis therefore reinforced a

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<sup>556</sup> Tajdoeddin, M. Z. (2007). *A Future Resource Curse in Indonesia: The Political Economy of Natural Resources, Conflict, and Development*. CRISE Working Paper No. 35. Oxford: Centre for Research on Inequality, Human Security, and Ethnicity (CRISE). Retrieved from <https://assets.publishing.service.gov.uk/media/57a08c05ed915d3cfd001100/wp35.pdf>

<sup>557</sup> Republic of Indonesia. *Keputusan Presiden Republik Indonesia Nomor 7 tahun 1979 tentang Rencana Pembangunan Lima Tahun Ketiga (REPELITA III) 1979/80 – 1983/84*.

<sup>558</sup> Interview with Dr Maxensius Tri Sambodo, MIDEK, Senior Researcher, Indonesian Institute of Sciences (Lembaga Ilmu Pengetahuan Indonesia/LIPI) based in Jakarta, 18 January 2021.

<sup>559</sup> Ooi. *Indonesia's Energy Transitions*.

<sup>560</sup> Romanova, T. (2013). Energy Demand: Security for Suppliers? In H. Dyer and M. J. Trombetta. (eds.) *International Handbook of Energy Security*. Edward Elgar: Cheltenham, UK, 239 – 257.

<sup>561</sup> Republic of Indonesia. *Keputusan Presiden Republik Indonesia Nomor 11 tahun 1974 tentang Rencana Pembangunan Lima Tahun Kedua (REPELITA II) 1974/75 – 1978/79*.

<sup>562</sup> Lucarelli. *The History and Future of Indonesia's Coal Industry*.

<sup>563</sup> See: James, P. (1984). *The Future of Coal*. London: Palgrave Macmillan; Rüdiger, M. (2014). The 1973 Oil Crisis and the Designing of a Danish Energy Policy. *Historical Social Research*, (39)(4), 94 – 112; Lucarelli. *The History and Future of Indonesia's Coal Industry*.

path dependence on energy diversification that Soeharto initiated at the beginning of his presidency.

Similarly, Indonesia again reaped substantial benefits during the second oil boom in 1979-1980.<sup>564</sup> Despite the ensuing “Dutch Disease” economic slowdown which necessitated Indonesia to devalue its Rupiah currency,<sup>565</sup> the State maintained its oil export and energy diversification strategy. The fortified energy diversification trajectory subsequently paved the way for the development of newer forms of energy sources such as solar photovoltaic, wind, biogas, and photo-electric or thermal chemical, in addition to the more established coal, hydropower, and geothermal power generation technologies, es exemplified by the opening of the country’s first 30MW geothermal power plant opened in Kamojang in 1981, followed by a second one of the same capacity in Dieng in 1984.<sup>566</sup>

The Soeharto administration also explored nuclear option for electricity generation. Preparations were undertaken by the National Nuclear Power Agency (Badan Tenaga Nuklir Nasional/BATAN). Unlike other non-oil energy sources, however, nuclear source proved to be controversial. Following an IAEA-assisted feasibility study in 1972, Soeharto was reportedly not fully in favour of constructing a nuclear power plant although the plan to build the country’s first nuclear power plant in Muria nearly advanced.<sup>567</sup> Ultimately, the plan was shelved due to a strong public resistance led by the Islamic organisation Nahdlatul Ulama.<sup>568</sup>

The State’s deep involvement in the energy sector was further reinforced and institutionalised by the establishment of the inter-ministerial National Energy Coordinating Agency (Badan

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<sup>564</sup> Ooi. *Indonesia’s Energy Transitions*.

<sup>565</sup> Gillis, M., Perkins, D. H., Roemer, M., and Snodgrass, D. R. (1992). *Economic of Development*, 3<sup>rd</sup> Edition. New York: Norton.

<sup>566</sup> Republic of Indonesia. *Keputusan Presiden Republik Indonesia Nomor 7 tahun 1979 tentang Rencana Pembangunan Lima Tahun Ketiga (REPELITA III) 1979/80 – 1983/84*.

<sup>567</sup> Amir, S. (2010). Nuclear Revival in Post-Suharto Indonesia. *Asian Survey*, (50)(2), 265 –286.

<sup>568</sup> (1994, January 29). Antiklimaks Nuklir Muria. Retrieved from Tempo: <https://majalah.tempo.co/read/ilmu-dan-teknologi/1256/antiklimaks-nuklir-muria>

Koordinasi Energi Nasional/BAKOREN). Mandated by the Presidential Decision No. 46 in 1980, BAKOREN was tasked to manage the overall strategy in the energy sector. Its specific responsibilities included formulating energy policy, drafting energy regulations, preparing guidelines for energy development and oversight, conducting research and development of energy sources, and coordinating domestic and international cooperation in energy research and development. Led by the mining and energy minister, BAKOREN's membership comprised the heads of the public works ministry, industry ministry, defence-security ministry, transportation ministry, agriculture ministry, research and technology ministry, environment ministry, civil service or national development planning ministry, and BATAN.<sup>569</sup>

BAKOREN formulated the first General Policy of the Energy Sector (Kebijakan Umum Bidang Energi/KUBE) in 1981. While energy diversification agenda had been featured from the first 1981 KUBE,<sup>570</sup> the link between renewable energy development and its environmental benefits only started to appear in the 1998 KUBE,<sup>571</sup> following the ratification of the 1992 through Law No. 6 Year 1994.<sup>572</sup>

Although the 1992 UNFCCC brought global climate change agenda concerns to Indonesia, its initial impact on shaping greenhouse gas reduction policies was limited. This was evident in Law No. 6 Year 1994, which, despite expressing an intent to address rising greenhouse gas emissions, did not identify the energy sector as a key component. Instead, the bill capitalised on Indonesia's vast tropical forests and sea cover and highlighted its role as a carbon sink. The country's contribution to climate mitigation thus focused on environmental rehabilitation, pollution

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<sup>569</sup> Republic of Indonesia. (1980, August 4). *Keputusan Presiden Republik Indonesia Nomor 46 Tahun 1980 tentang Badan Koordinasi Energi Nasional*.

<sup>570</sup> MEMR. (2006). *Blueprint Pengelolaan Energi Nasional 2006- 2025*. Retrieved from [https://www.esdm.go.id/assets/media/content/Blueprint\\_PEN\\_tgl\\_10\\_Nop\\_2007.pdf](https://www.esdm.go.id/assets/media/content/Blueprint_PEN_tgl_10_Nop_2007.pdf)

<sup>571</sup> BAKOREN. (1998). *Kebijakan Umum Bidang Energi di Indonesia, 4<sup>th</sup> Edition*. Jakarta: Indonesian Ministry of Mines and Energy.

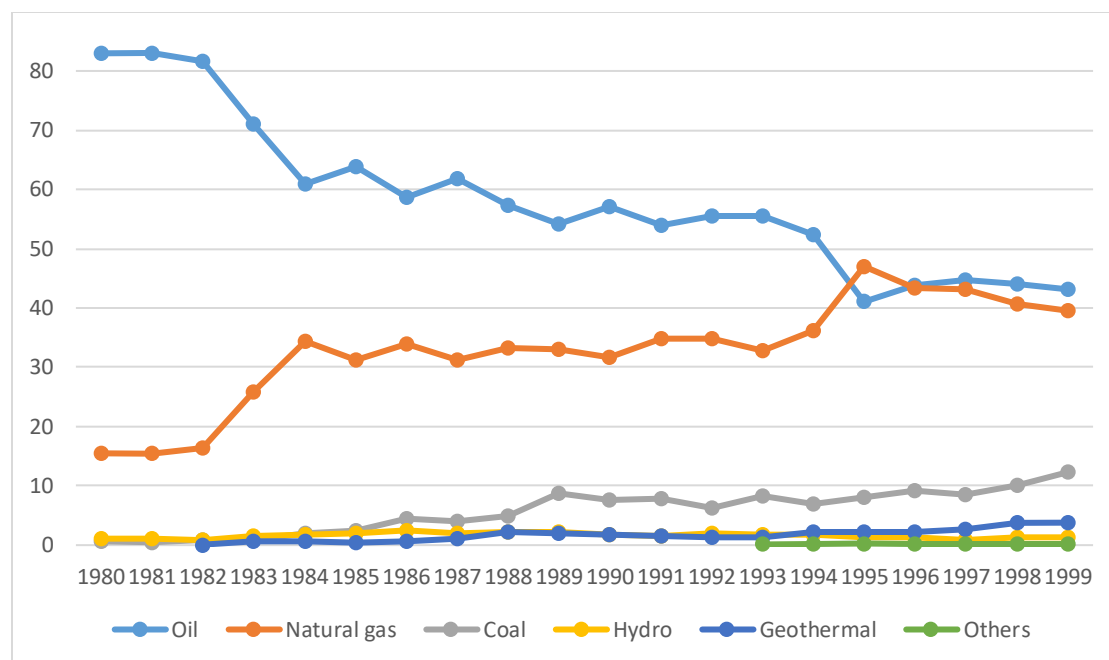
<sup>572</sup> Republic of Indonesia. (1994). *Law No. 6 Year 1994 on the Ratification of the United Nations Framework Convention on Climate Change*. Retrieved from <http://sipongi.menlhk.go.id/cms/images/files/1025.pdf>

control, and improving environmental quality. This response reflected a path dependence on fossil fuel use and signified that the reference to renewable energy's environmental benefits in the KUBE 1998 did not imply an intention to replace fossil fuels.

In summary, under Soeharto's leadership, Indonesia's energy sector underwent institutional shifts through layering, seen in the opening of the energy sector to foreign investments and entities while retaining State's deep involvement in the sector through state-owned enterprises. Concurrently, the policies introduced during Soeharto's presidency had resulted in expanded exploration and utilisation of both oil and non-oil energy sources such as coal, natural gas, and geothermal. This development thus reinforced a path dependence on State deep involvement and the country's continued reliance on fossil fuel use.

Soeharto administration's relative success in diversifying energy sources was reflected in Indonesia's changing primary energy supply seen in Figure 4.2. Although Soeharto's presidency began in 1968, Figure 4.2 shows trends from 1980 due to data availability, displaying a decline in oil share and an increase in natural gas share in the mid-1980s, and growing shares of geothermal and coal in the late 1980s.

**Figure 4. 2: Indonesia's Primary Energy Supply by Sources (%), 1980 to 1999**



Source: APEC Energy Working Group - Expert Group on Energy Data and Analysis (EGED). (n.d.). *Primary Energy Supply Table*. Retrieved from [https://www.egeda.ewg.apec.org/egeda/database\\_info/newprimary\\_select\\_form.html](https://www.egeda.ewg.apec.org/egeda/database_info/newprimary_select_form.html)

#### 4.5. Energy Sector in the Early Reform Era (1998 to 2014)

Soeharto's 32-year authoritarian regime ended on 21 May 1998 against the backdrop of the 1997 Asian financial crisis, which had a profound impact on the State's performance in the energy sector. Many infrastructure projects commissioned by state-owned Pertamina and PLN were delayed or cancelled, necessitating independent power producers to reschedule power plant developments.<sup>573</sup> Under the IMF pressure, the Indonesian government re-evaluated the pricing and the production schedules of the affected power projects.<sup>574</sup> Of the 27 private developers that had signed the Power Purchase Agreements with the PLN, some awaited further development from the Indonesian government, while others sought reparations through international

<sup>573</sup> Yusgiantoro. *Rekam Jejak Dua Periode ESDM*.

<sup>574</sup> Wells, L. T. (2007). The Private Power in Indonesia. *Bulletin of Indonesian Economic Studies*, (43)(3), 341 – 363.

arbitration, and concurrently, 159 energy infrastructure projects related to Pertamina's oil and gas activities became poorly managed following the economic crisis.<sup>575</sup>

State-owned PLN itself was badly affected by the financial crisis. Between 1997 and 1998, the value of Indonesian currency Rupiah (Rp) depreciated by nearly 350 percent, from Rp2,880 to Rp10,194 per USD.<sup>576</sup> The currency devaluation had significantly increased the PLN's payment obligations to private power producers, as these payments were in USD, while its revenue from consumers was in Rupiah.<sup>577</sup> Consequently, the PLN faced substantial financial strain.

The financial hardship prompted Indonesia to seek external assistance. In exchange for a standby loan from the IMF, the World Bank, the ADB, and contingency loans from Japan and Singapore, the Indonesian government pledged to undertake comprehensive macroeconomic, financial, and structural reforms.<sup>578</sup> Before Soeharto's presidency ended, Indonesia submitted a letter of intent to the IMF on 31 October 1997, outlining plans for deregulation and privatisation as part of structural reforms.<sup>579</sup>

Shortly after Soeharto stepped down, following large-scale demonstrations and chaos in the Indonesian capital Jakarta triggered by the Asian financial crisis, the Indonesian government submitted another letter of intent dated 13 November 1998, expressing its plan to restructure and privatise 150 state enterprises, including state-owned PLN, between 1999 and 2001.<sup>580</sup> The promised reforms potentially caused a significant departure from State longstanding deep involvement in the energy sector, making the 1997 Asian financial crisis a candidate for critical juncture in the sector.

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<sup>575</sup> Yusgiantoro. *Rekam Jejak Dua Periode ESDM*.

<sup>576</sup> Sambodo. *From Darkness to Light: Energy Security Assessment in Indonesia's Power Sector*.

<sup>577</sup> Wells. *The Private Power in Indonesia*.

<sup>578</sup> Soesastro, H., and Basri, M.C. (1998). Survey of Recent Developments. *Bulletin of Indonesian Economic Studies*, (34)(1), 3 – 54.

<sup>579</sup> IMF (International Monetary Fund). (1997, October 31). *Letter of Intent of the Government of Indonesia*. Retrieved from <https://www.imf.org/external/np/loi/103197.htm>

<sup>580</sup> IMF. (1998, November 13). *Letter of Intent of the Government of Indonesia*. Retrieved from <https://www.imf.org/external/np/loi/1113a98.htm>

The end of the Soeharto authoritarian leadership ushered in a new Reform era characterised by democracy and decentralisation, which weakened the concentration of power of the president and the bureaucracy.<sup>581</sup> The first few years of the Reform era were tumultuous, marked by frequent changes in leadership within a short span of time, namely from President B. J. Habibie to President Abdurrahman Wahid on 20 October 1999, and from President Abdurrahman Wahid to President Megawati Soekarnoputri on 23 July 2001. The country's democratisation also allowed CSOs to influence policymaking although the extent of their involvement and influence in policymaking varied according to contexts.

The efforts to privatise the electricity sector that began towards the end of Soeharto's presidency in 1998 culminated in the signing of the Electricity Law No. 20 in 2002 by President Soekarnoputri. The Law, however, drew objections from members of the public. On 11 February 2002, a few months before the passage of the Law, a group of CSOs comprising the International NGO Forum on Indonesia Development (INFID), the Foundation Gei Nastiti (Yayasan Gei Nastiti/GENI), the Legal Aid Institute (Lembaga Bantuan Hukum Jakarta/LBH Jakarta), the Indonesia Corruption Watch (ICW), the Indonesian Forum for Environment (Wahana Lingkungan Hidup Indonesia/Walhi), and the Bank Information Center (BIC) wrote to the Parliament's Commission VII to express their concerns, emphasising the need for the government to conduct a thorough evaluation of the country's readiness before privatising the electricity sector; and following the Law's enactment, three different groups namely: (a) the Human Rights Defenders and Lawyers Association (Asosiasi Penasehat Hukum dan Hak Asasi Manusia Indonesia/APHI), the Legal Aid and Human Rights Association (Perhimpunan Bantuan Hukum dan Hak Asasi Manusia Indonesia/PBHI), and the Foundation 324 (Yayasan 324); (b) the PLN

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<sup>581</sup> Basri, M. C., and Hill, H. (2004). Ideas, Interests and Oil Prices: The Political Economy of Trade Reform during Soeharto's Indonesia. *The World Economy*, (27)(5), pp. 633 – 655.

Worker Union; and (c) individuals Ir. Januar Muin and Ir. David Tombeng, lodged legal complaints to the Indonesian Constitutional Court to review the Law.<sup>582</sup>

On 15 December 2004, the Constitutional Court ruled the 2002 Electricity Law unconstitutional, citing a violation of the 1945 Constitution, which mandated that the provision of public goods be in the hands of the State.<sup>583</sup> This Constitutional Court ruling thus marked the 1997 Asian financial crisis a near-miss critical juncture by halting the attempt to privatise the electricity sector, maintaining state-owned PLN's monopoly in the sector, and reinforcing the path dependence on State deep involvement in the energy sector.

The opportunity to substantively develop renewable energy sources came with the formulation of the 2003-2020 National Energy Policy (Kebijakan Energi Nasional/KEN), which was the first energy policy issued in the Reform era. The policy, formalised in Ministerial Decree No. 0983 K/16/MEM/2004 and signed by Energy Minister Purnomo Yusgiantoro on 6 May 2004 near the end of President Soekarnoputri's term,<sup>584</sup> framed economic growth and emerging challenges related to oil use as the main driving force in the energy sector. By this time, Indonesia's oil reserves were depleting, and oil production was insufficient to meet domestic demand. The policy document identified renewable energy development as a solution to this problem.

To overcome cost challenges associated with renewable energy technologies, the 2003-2020 KEN introduced fiscal incentives such as tax reductions and leveraged international climate commitments to secure necessary support. This demonstrated Indonesia's strategic use of international agreements on environmental issues, which often positioned developing countries

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<sup>582</sup> Sambodo. *From Darkness to Light: Energy Security Assessment in Indonesia's Power Sector*.

<sup>583</sup> Constitutional Court of the Republic of Indonesia. (2018). *Anotasi Undang-Undang Berdasarkan Putusan Mahkamah Konstitusi: Undang-Undang Republik Indonesia Nomor 20 Tahun 2002 tentang Ketenagalistrikan*. Retrieved from

[https://www.mkri.id/public/content/infoumum/undang/pdf/Anotasi\\_94\\_Anotasi%20%20no.%20%2020thn%202002%20Listrik.pdf](https://www.mkri.id/public/content/infoumum/undang/pdf/Anotasi_94_Anotasi%20%20no.%20%2020thn%202002%20Listrik.pdf)

<sup>584</sup> Republic of Indonesia. (2004b). *Keputusan Menteri Energi dan Sumber Daya Mineral Nomor: 0983 K/16/MEM/2004 tentang Kebijakan Energi Nasional*. Retrieved from

<https://jdih.esdm.go.id/peraturan/kepmen-0983-2004.pdf>

as recipients of financial and technical assistance from developed countries. One example was the Clean Development Mechanism (CDM). Established under the 1997 Kyoto Protocol, the CDM was designed to incentivise developed countries to install renewable energy systems in developing countries.<sup>585</sup>

Indonesia ratified the 1997 Kyoto Protocol through Law No. 17 Year 2004 during Soekarnoputri's presidency.<sup>586</sup> This Law clearly indicated Indonesia's intention to benefit from the CDM to expand its renewable energy installations. However, in resemblance to the approach observed in the 1998 KUBE, the Law did not include provisions to reduce fossil fuel use despite aiming to develop renewable energy. This further highlights a path dependence on continued fossil fuel use, with renewable energy serving as an additional measure to enhance energy security amid rising energy demand.

This trajectory continued to the next administration. President Susilo Bambang Yudhoyono (SBY) succeeded Soekarnoputri in October 2004 not long after the issuance of the 2003-2020 KEN and the ratification of the Kyoto Protocol under Law No. 17 year 2004. During his administration, national economic recovery following the 1997 Asian financial crisis remained an important objective, with increased investment and exports in the mining and energy sectors deemed essential to achieving that goal.<sup>587</sup>

State continuing deep involvement in the energy sector facilitated SBY to exercise his agency to introduce incremental changes in the energy sector by mainstreaming climate agenda into national policies regardless of the enduring roles of fossil fuels in the energy sector and in the economy. Driven by a desire to be seen as a president with an international outlook, SBY actively

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<sup>585</sup> United Nations Climate Change. (n.d.b.). *The Clean Development Mechanism*. Retrieved March 4, 2022 from: <https://unfccc.int/process-and-meetings/the-kyoto-protocol/mechanisms-under-the-kyoto-protocol/the-clean-development-mechanism>

<sup>586</sup> Republic of Indonesia. (2004a). *Law No. 17 Year 2004 on the Ratification of the Kyoto Protocol as the Working Convention Framework of the United Nations on Climate Change*. Retrieved from <https://peraturan.bpk.go.id/Home/Details/40514>

<sup>587</sup> Yusgiantoro. *Rekam Jejak Dua Periode ESDM*.

engaged with issues important to the global community, particularly those valued in the West, such as environmental protection and climate change.<sup>588</sup> Consequently, under SBY's leadership, the State formulated an unprecedented number of national and international policies on these matters,<sup>589</sup> as illustrated in Table 4.2 below.

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<sup>588</sup> Fitriani, E. (2015). Yudhoyono's Foreign Policy: Is Indonesia a Rising Power? In E. Aspinall, M. Mietzner, and D. Tomas. (eds.) *The Yudhoyono Presidency: Indonesia's Decade of Stability and Stagnation*. Singapore: Institute of Southeast Asian Studies, 73 – 90.

<sup>589</sup> Anderson, P., Firdaus, A., and Mahaningtyas, A. (2015). Big Commitments, Small Results: Environmental Governance and Climate Change Mitigation under Yudhoyono. In E. Aspinall, M. Mietzner, and D. Tomas. (eds.) *The Yudhoyono Presidency: Indonesia's Decade of Stability and Stagnation*. Singapore: Institute of Southeast Asian Studies, 258 –280.

**Table 4. 2: Timeline of Indonesia’s Climate Change Policy (2004 to 2014)**

<b>Year</b>	<b>Policy Development</b>	<b>Institutions and Other Initiatives</b>
2005		Establishing Designated National Authority (DNA)-Clean Development Mechanism (CDM)
2006	Presidential Decree No. 5 on National Energy Policy	
2007	Long-term National Development Program (RPJP 2005-2025) by Law No. 17	Hosting COP13 in Bali and the resultant Bali Action Plan and Bali Road Map
2008	National Development Planning Response to Climate Change (“Yellow Book”)	Establishing National Council on Climate Change by Presidential Instruction No. 46; Establishing National Energy Council by Presidential Regulation No. 26
2009	Economic and Fiscal Policy Strategies for Climate Change Mitigation (“Green Paper”); Mid-term National Development Program (RPJMN 2010-2014)	Law no. 32 on Protection and Management of Environment; Establishing Indonesia Climate Change Trust Fund (ICCTF); Hosting World Ocean Conference in Manado
2010	Indonesia Climate Change Sectoral Roadmap (ICCSR)	Promotion of Adaptation Section Parallel to Mitigation at the Ministry of Environment; Establishing Indonesia Green Investment Fund (IGIF); Signing Letter of Intent (LoI) between the Norwegian Government and the Indonesian Government to support Indonesia Reducing GHG Emissions
2011	National Action Plan on Greenhouse Gas (GHGs) by Presidential Decree No 61/2011; Presidential Decree No 71/2011 on GHGs Emission Inventory; and Guideline for Developing Local Action for GHGs Reduction; Presidential Instruction No. 11 on Moratorium on the Issuance of Permits for Primary Forests and Peatlands	Second National Communication; Establishing REDD+ Task Force by Presidential Decree No. 25
2012	Local Action Plan on Climate Change	Establishing REDD+ National Strategy
2013	National Action Plan on Climate Change Adaptation; Presidential Instruction No. 6 on the Moratorium of the Issuance of Permits for Primary Forests and Peatlands	Establishing Management Agency on REDD+ by Presidential Decree No. 6

Source: Sinaga, L. C. (2020). Assessing the Commitment of Indonesian Government towards Climate Change Policy: The Yudhoyono Presidency 2004 – 2014. *Politica*, (11)(2), 163 – 182.

His most remarkable expressions at the international level included the hosting of the COP13 in Bali in 2007, the pledging of Indonesia's GHG emission reduction by 26 percent through its own efforts by 2020, and by 41 percent with international assistance at the 2009 G20 meeting in Pittsburgh,<sup>590</sup> and the proposal for the formation of the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF) regional body in the 8<sup>th</sup> Convention on Biological Diversity in Brazil in 2006.<sup>591</sup>

The institutional change that SBY effected through the mainstreaming of climate agenda in national policies amounted to layering in the energy sector because it introduced new agendas relating to environment without making any fundamental changes in the sector. Law No. 30 Year 2007 on Energy was a key legislation that illustrated this layering by expanding the principles of energy security<sup>592</sup> to include not only energy sufficiency, availability, accessibility, and optimisation, but also environmental preservation.<sup>593</sup> The Law defined *new energy sources* to include nuclear, hydrogen, coal bed methane, liquified coal, and gasified coal, as well as *renewable energy sources* to include geothermal, wind, bioenergy, solar, hydropower, and tidal power. It also outlined their potential contributions to the country's energy security alongside conventional fossil fuel sources, thereby placing greater emphasis on the importance of new and renewable energy sources within Indonesia's energy strategy compared to the previous administrations.

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<sup>590</sup> (2009, September 25). *Intervention By H.E. Dr. Susilo Bambang Yudhoyono President of the Republic of Indonesia on Climate Change*. G-20 Leaders Summit, Pittsburgh, PA [ 13:00 - Working Lunch]. Retrieved from <http://www.redd-monitor.org/wp-content/uploads/2013/10/2009-09-25-Intervention-by-President-SBY-on-Climate-Change-at-the-G-20-Leaders-Summit.pdf>

<sup>591</sup> Ministry of Foreign Affairs of the Republic of Indonesia. (2023, May 19). *Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF)*. Retrieved from [https://kemlu.go.id/portal/en/read/136/halaman\\_list\\_lainnya/coral-triangle-initiative-cti#!](https://kemlu.go.id/portal/en/read/136/halaman_list_lainnya/coral-triangle-initiative-cti#!).

<sup>592</sup> Indriyanto, A. R. S., Wattimena, B. A. T., Batih, H., Sari, I. and Triandi. (2015). *Policy and Regulatory Perspectives of Energy Security*. Retrieved from <https://iiee.or.id/wp-content/uploads/2015/07/POLICY-AND-REGULATORY-PERSPECTIVES-on-ENERGY-SECURITY.pdf>

<sup>593</sup> Republic of Indonesia. (2007). *Undang-undang Republik Indonesia Nomor 30 tahun 2007 tentang Energi*. Retrieved from <https://jdih.esdm.go.id/peraturan/uu-30-2007.pdf>

In addition, the Law mandated the establishment of the National Energy Council (Dewan Energi Nasional/DEN) to replace BAKOREN. Unlike BAKOREN, which was headed by energy minister, the DEN was led directly by the President. This new organisational arrangement enhanced its capacity to perform inter-ministerial and inter-agency coordination for more effective energy sector management. DEN is still in operation at the time of this dissertation writing.

Institutional change through layering was also evident in Presidential Regulation no. 61 of 2011 on National Action Plan to Reduce Greenhouse Gas Emissions,<sup>594</sup> which was the first policy in the country that subjected the energy sector to emission reduction measures along with other sectors such as transportation, industry, waste management, agriculture, forestry and peatland. This regulation targeted emission reduction by 26 percent by own efforts and by 41 percent with international assistance within each identified sector following SBY's pledge in Pittsburgh in 2009. The regulation also assigned relevant ministries, including the Ministry of Energy and Mineral Resources, the Ministry of Transportation, the Ministry of Industry, the Ministry of Agriculture, the Ministry of Forestry, the Ministry of Finance, and the Ministry of Public Works, to implement the action plan within stipulated time periods. In the energy sector, strategies included reducing energy demand through energy conservation and developing new and renewable energy sources. As for climate adaptation, Indonesia formulated the National Action Plan for Climate Adaptation in 2012 and prioritised actions in the agriculture, coastal, ocean, fishery, small islands, health, and public works sectors and tapped into existing policies and regulations to formulate climate adaptation action plans in each of the identified sectors.<sup>595</sup>

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<sup>594</sup> Republic of Indonesia. (2011a). *Presidential Regulation No. 61 Year 2011 on National Action Plan to Reduce Greenhouse Gas Emissions*. Retrieved from [http://www1.bappenas.go.id/files/1114/1214/1681/Peraturan\\_Presiden\\_Republik\\_Indonesia\\_No.61\\_tahun\\_2012\\_tenang\\_Rencana\\_Aksi\\_Nasional\\_Penurunan\\_Emisi\\_Gas\\_Rumah\\_Kacaindonesia.pdf](http://www1.bappenas.go.id/files/1114/1214/1681/Peraturan_Presiden_Republik_Indonesia_No.61_tahun_2012_tenang_Rencana_Aksi_Nasional_Penurunan_Emisi_Gas_Rumah_Kacaindonesia.pdf)

<sup>595</sup> Dewan Nasional Perubahan Iklim (National Council on Climate Change). (2012). *Rencana Aksi Nasional Adaptasi Perubahan Iklim Indonesia*. Jakarta: Dewan Nasional Perubahan Iklim. Retrieved from [https://d1wqtxts1xzle7.cloudfront.net/32482145/BUKU\\_RENCANA\\_DNPI\\_ADAPTASI\\_%2826022012%29.pdf?20131204-19313-zw8cxc-libre-libre.pdf?1386190676=&response-content-](https://d1wqtxts1xzle7.cloudfront.net/32482145/BUKU_RENCANA_DNPI_ADAPTASI_%2826022012%29.pdf?20131204-19313-zw8cxc-libre-libre.pdf?1386190676=&response-content-)

Another transformative policy that affected the energy sector was the Presidential Regulation no. 71 of 2011 on National Greenhouse Gas Stocktaking<sup>596</sup> that mandated greenhouse gas assessments across sectors that utilised energy. These sectors encompassed electricity generation, industry, transportation, residential and commercial buildings, agriculture, construction and mining. This underscored a stronger awareness of the far-reaching consequences of energy use on increasing greenhouse gas emissions. Additionally, the regulation required regional and local governments to conduct similar assessments in their respective jurisdictions.

While the State under SBY leadership made significant strides in the environment and climate change agenda, the path dependence on fossil fuel use was simultaneously reinforced as evidenced in the surge in domestic coal production. Spurred by China's economic boom, the demand for Indonesian coal soared, leading to a remarkable 93 percent increase in coal production and a 10 percent annual growth rate per year between 2002 and 2009, which propelled Indonesia to become the largest exporter of steam coal in the world by 2005.<sup>597</sup>

Moreover, during SBY's presidency, the coal industry saw an increase in the prominence of domestic companies, particularly following the sale of ownerships of large foreign coal companies such as BHP, BP/Rio Tinto, New Hope Mining of Australia, and Samtan of Korea in the early 2000s, as domestic players progressively assumed the majority share or managerial roles in

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<sup>596</sup> Republic of Indonesia. (2011b). *Presidential Regulation no. 71 year 2011 on National Greenhouse Gas Stocktaking*. Retrieved from

[https://peraturan.bpk.go.id/Home/Download/69584/Perpres\\_no\\_71\\_2011.pdf](https://peraturan.bpk.go.id/Home/Download/69584/Perpres_no_71_2011.pdf)

<sup>597</sup> Lucarelli. *The History and Future of Indonesia's Coal Industry*.

Indonesia's four largest coal companies namely KPC, Arutmin, Adaro, and Kideco and Indonesia, which collectively accounted for 57 percent of total coal production in 2002.<sup>598</sup>

The increased involvement of domestic coal companies coincided with the decentralisation initiatives that were enabled by the passage of Law no. 32 year 2004 on Local Government. The Law granted regional governments greater control over the utilisation of natural resources within their jurisdictions, thereby reinforcing a path dependence on fossil fuel use, as mining activities became important revenue sources for local governments.<sup>599</sup> Importantly, the convergence of domestic players' increased participation in the coal industry and coal's growing importance in the local economy had arguably bolstered the coal sector's political significance. This was evidenced by the increasing influence of domestic coal companies within the government and state-owned PLN.<sup>600</sup>

At this juncture, it is apparent that the State simultaneously pursued the expansion of fossil fuel and renewable energy sources. The State's two-pronged pursuit of both coal development and climate action was reflected in the 2006 KEN, formalised under Presidential Regulation No. 5 Year 2006. On one hand, aligned with climate change mitigation objectives, the 2006 KEN was the first policy that set quantitative targets for new and renewable energy sources, signifying a stronger intention for their development. It aimed for biofuels, geothermal, biomass, nuclear, hydropower, solar power, wind power, and liquefied coal to constitute over 17 percent of the Indonesia's primary energy mix by 2025.<sup>601</sup> State's commitment to expand renewable energy use was further demonstrated in the establishment of the Directorate of New Renewable Energy and Energy Conservation (Energi Baru Terbarukan dan Konservasi Energi/EBTKE) within the

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<sup>598</sup> Lucarelli. *The History and Future of Indonesia's Coal Industry*.

<sup>599</sup> Interview with Fabi Tumiwa, Executive Director, the Institute for Essential Services Reform (IESR), based in Jakarta, 19 January 2021.

<sup>600</sup> Interview with Dwi Sawung, Campaign Manager for Energy and Cities, the Indonesian Forum for the Environment (Wahana Lingkungan Hidup Indonesia/Walhi), based in Jakarta, 6 October 2021.

<sup>601</sup> Republic of Indonesia. (2006, January 25). *Peraturan Presiden Republik Indonesia Nomor 5 Tahun 2006 tentang Kebijakan Energi Nasional*. Retrieved from <https://jdih.kemenkeu.go.id/fulltext/2006/5TAHUN2006PERPRES.HTM>

Ministry of Energy and Mineral Resources in 2010, which was previously subsumed under the Electricity and Energy Utilisation directorate, following the issuance of Presidential Regulation No. 5 year 2006.<sup>602</sup>

On the other hand, while the 2006 KEN set a firmer path for renewable energy expansion, it also envisioned that “*more than 33 percent*”<sup>603</sup> of coal would comprise the country’s primary energy mix by 2025. This plan was subsequently translated into Presidential Regulation No. 71 Year 2006,<sup>604</sup> establishing the foundation for state-owned PLN to launch its First Fast Track Programme that aimed to develop 10,000MW coal-fired power plants between 2006 and 2010.<sup>605</sup>

Subsequent Presidential Regulation No. 4 Year 2010 similarly instructed the PLN to build new power plants.<sup>606</sup> Unlike the First Fast Track Programme, however, this regulation explicitly mandated the use of renewable energy and gas alongside coal. Ministerial Regulation no. 2 Year 2010 was issued to detail the projects that the PLN would undertake following this directive.<sup>607</sup> Under this framework, the PLN launched its Second Fast Track Programme, with 66 percent of the total 10,047MW planned to come from renewable energy sources comprising 4,900MW geothermal and 1,753MW hydropower.<sup>608</sup> The bigger allocation to renewable energy sources

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<sup>602</sup> EBTKE Senior Official. Interview. 2023.

<sup>603</sup> Emphasis added.

<sup>604</sup> Republic of Indonesia. (2006, July 5). *Peraturan Presiden Republik Indonesia Nomor 71 Tahun 2006 tentang Penugasan kepada PT Perusahaan Listrik Negara (Persero) untuk Melakukan Percepatan Pembangunan Pembangkit Tenaga Listrik yang Menggunakan Batubara*. Retrieved from <https://jdih.kemenkeu.go.id/FullText/2006/71TAHUN2006PERPRES.HTM>

<sup>605</sup> MEMR. (2008, June 16). *Perkembangan Program Percepatan 10.000 MW*. Retrieved from <https://www.esdm.go.id/en/media-center/news-archives/perkembangan-program-percepatan-10000-mw>

<sup>606</sup> Republic of Indonesia. (2010, January 8). *Peraturan Presiden Republik Indonesia Nomor 4 Tahun 2010 tentang Penugasan kepada PT Perusahaan Listrik Negara (Persero) untuk Melakukan Percepatan Pembangunan Pembangkit Tenaga Listrik yang Menggunakan Tenaga Listrik Terbarukan, Batubara, dan Gas*. Retrieved from <https://www.bphn.go.id/data/documents/10pro04.pdf>

<sup>607</sup> Saleh, D. Z. (2010, January 27). *Peraturan Menteri Energi dan Sumber Daya Mineral Nomor 2 Tahun 2010 tentang Daftar Proyek-Proyek Percepatan Pembangunan Pembangkit Tenaga Listrik Yang Menggunakan Energi Baru Terbarukan, Batubara, dan Gas Serta Transmisi Terkait*. Retrieved from <https://jdih.maritim.go.id/cfind/source/files/permenesdm/2010/permen-esdm-02-2010.pdf>

<sup>608</sup> MEMR. (2012, July 24). *Perkembangan Fast Track Program (FTP) Tahap I dan II*. Retrieved from <https://www.esdm.go.id/id/media-center/arsip-berita/perkembangan-fast-track-program-ftp-tahap-i-dan-ii>

compared to fossil fuels signified the State's efforts to achieving renewable energy target despite the concurrent increase in coal use. At this juncture, the effect of the State deep involvement in influencing the country's energy choices is evident.

Presidential Regulation no. 61 year 2011, issued during SBY's second presidential term, reflected a similar two-pronged approach. It established quantifiable targets and timelines for the expansion of new and renewable energy sources, demonstrating a stronger intention for their deployment. For example, the action plan aimed to increase solar power installations from 102.1MW between 2010-2014 to 224.68MW between 2015-2020 and projected an increase in wind power installations from 21.67MW to 37.53MW during the same period across all Indonesian provinces.<sup>609</sup>

Like the 2006 KEN, however, Presidential Regulation no. 61 year 2011 also featured the intention to continue fossil fuel use. While acknowledging the necessity to reduce fossil fuel dependency, it did not outline a systematic way to achieve this goal. Instead, the action plan promoted increased use of natural gas across various applications.

The path dependence on fossil fuel use persisted despite a growing pro-climate and anti-fossil movement among civil society groups during SBY's presidency. In 2000, Greenpeace set up its Southeast Asia and brought with it the energy transition agenda.<sup>610</sup> It began to accelerate its energy campaigns in 2008,<sup>611</sup> primarily targeting the coal industry and its use in electricity generation. Their strategies included creative campaigns, confrontation, lobbying and mobilisation.<sup>612</sup> Greenpeace Indonesia staged protests against plans to construct the Batang coal-

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<sup>609</sup> Republic of Indonesia. *Presidential Regulation No. 61 Year 2011 on National Action Plan to Reduce Greenhouse Gas Emissions*.

<sup>610</sup> Greenpeace Southeast Asia. (n.d.b.). *2015 Annual Report: Creating the Future We Want*. Retrieved from [https://www.greenpeace.org/static/planet4-southeastasia-stateless/2019/04/248f9686-248f9686-gp\\_sea\\_ar\\_mobile.pdf](https://www.greenpeace.org/static/planet4-southeastasia-stateless/2019/04/248f9686-248f9686-gp_sea_ar_mobile.pdf)

<sup>611</sup> Interview with Tata Mustasya, Southeast Asia Regional Climate and Energy Campaign Coordinator, Greenpeace based in Jakarta, 20 January 2021.

<sup>612</sup> Greenpeace Southeast Asia. *2015 Annual Report: Creating the Future We Want*.

fired power plant<sup>613</sup> and the Celukan Bawang coal power plant,<sup>614</sup> mobilising local population and collaborating with like-minded organisations. These efforts resulted in, for example, delays for the Batang coal-fired power plant project<sup>615</sup> and disruptions in coal supply delivery in Cirebon.<sup>616</sup>

Similar to Greenpeace, the WWF Indonesia started its Climate and Energy Programme in the early 2000s.<sup>617</sup> However, unlike Greenpeace, the WWF Indonesia opted for a more collaborative and peaceful approach by partnering with the government. In addition to advocating low-carbon energy policies, the WWF Indonesia conducted awareness-raising campaigns, facilitated stakeholders in developing a clean and sustainable energy sector, and assisted Indonesian negotiators in preparing national and international climate plans, among others.<sup>618</sup>

The CSOs used various arguments to discredit the coal industry, highlighting pollution and its impacts on health, coastal ecosystems, fishermen's livelihoods, and human rights violations related to land acquisition and forced evictions. They also linked new coal power plant projects to corruption cases implicating some of the country's top officials. These included Emir Moeis, a PDI Perjuangan party politician implicated in a corruption case at the Tarahan coal-fired power plant in Lampung, receiving a 3-year jail term in 2014;<sup>619</sup> Suprihono, the Secretary of the Cilacap administration, implicated in Bunton coal-fired power plant in Cilacap and sentenced in 2012,<sup>620</sup>

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<sup>613</sup> Greenpeace Southeast Asia. (n.d.d.). *2017 Annual Report: Breaking Boundaries*. Retrieved from <https://www.greenpeace.org/static/planet4-southeastasia-stateless/2020/03/d509f48e-greenpeace-southeast-asia-2017-annual-report.pdf>

<sup>614</sup> Greenpeace Southeast Asia. (n.d.e.). *Sounding the Alarm: Annual Report 2019*. Retrieved from <https://www.greenpeace.org/static/planet4-southeastasia-stateless/2020/10/2fod602d-greenpeace-august-2020-cs6-explore-v9a.pdf>

<sup>615</sup> Greenpeace Southeast Asia. *2017 Annual Report: Breaking Boundaries*.

<sup>616</sup> Greenpeace Southeast Asia. (n.d.c.). *2016 Annual Report: The Power of Many*. Retrieved from [https://www.greenpeace.org/static/planet4-southeastasia-stateless/2019/04/358f1673-358f1673-greenpeace\\_southeast\\_asia\\_annualreport\\_2016.pdf](https://www.greenpeace.org/static/planet4-southeastasia-stateless/2019/04/358f1673-358f1673-greenpeace_southeast_asia_annualreport_2016.pdf)

<sup>617</sup> WWF (World Wide Fund for Nature). (n.d.). *Turning Down the Heat, WWF-Indonesia Annual Report FY 2007-2008*. Jakarta: Yayasan WWF-Indonesia. Retrieved from [http://awsassets.wwf.or.id/downloads/wwfid\\_annualreport\\_2007\\_2008.pdf](http://awsassets.wwf.or.id/downloads/wwfid_annualreport_2007_2008.pdf)

<sup>618</sup> WWF. *Turning Down the Heat*.

<sup>619</sup> (2014, April 14). *Emir Moeis Divonis 3 Tahun Penjara*. Retrieved from Kompas:

<https://nasional.kompas.com/read/2014/04/14/1151304/Emir.Moeis.Divonis.3.Tahun.Penjara>

<sup>620</sup> (2014, April 1). *Korupsi Proyek PLTU Bunton, PK Eks Sekda Cilacap Ditolak*. Retrieved from Detiknews: <https://news.detik.com/berita/d-2542375/korupsi-proyek-pltu-bunton-pk-eks-sekda-cilacap-ditolak>

Irianto Syafiuddin, the Indramayu regent, implicated in the Indramayu coal-fired power plant and sentenced in 2016,<sup>621</sup> and Eni Maulani Saragih, a Parliament member from Golkar party and the vice chair of Parliament's Commission VII overseeing energy affairs, implicated in Riau 1 coal-fired power plant and was sentenced in 2019.<sup>622</sup>

The CSOs also actively voiced their perspectives at international and regional conferences. For example, formed in 2006, the Indonesia Civil Society Forum for Climate Justice (CSF-CJI) was present at the 2017 COP13 in Bali, Indonesia, to demand climate justice.<sup>623</sup> At the 2019 COP15 in Bonn, the CSF-CJI issued a statement urging developed countries to adopt more ambitious emission mitigation measures.<sup>624</sup> During the ASEAN People Forum in 2011, the CSF-CJI presented six recommendations for the climate justice agenda.<sup>625</sup> In the context of the Rio-20 Conference in 2012, the CSF-CJI issued a statement challenging the blue economy concept, arguing that it did not alter the prevailing neoliberal economic development model, which they believed was the main cause of continued carbon emissions.<sup>626</sup>

While CSOs campaigned against continuing fossil fuel use, the State progressively reinforced renewable energy development pathway. This was reflected in the 2014 KEN, which SBY signed on 17 October 2014, just days before completing his second presidential term. Formalised in Government Regulation no. 79 year 2014, it was the first energy policy formulated by the newly

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<sup>621</sup> Rahadian, L. (2016, May 23). *Korupsi PLTU, Eks Bupati Indramayu Dijebloskan ke Penjara*. Retrieved from CNN Indonesia: <https://www.cnnindonesia.com/nasional/20160523223405-12-132973/korupsi-pltu-eks-bupati-indramayu-dijebloskan-ke-penjara>

<sup>622</sup> Aji, M. R., and Persada, S. (2019, March 1). *Eni Saragih Divonis 6 Tahun Penjara Dalam Kasus Suap PLTU Riau-1*. Retrieved from Tempo: <https://nasional.tempo.co/read/1180868/eni-saragih-divonis-6-tahun-penjara-dalam-kasus-suap-pltu-riau-1/full&view=ok>

<sup>623</sup> Olsen, K. (2007, December 13). *Demanding Climate Justice in Bali*. Retrieved from Google: <https://blog.google/outreach-initiatives/sustainability/demanding-climate-justice-in-bali/>

<sup>624</sup> (2009, June 12). *Bumi Bakal Gagal Diselamatkan?* Retrieved from Kompas: <https://nasional.kompas.com/read/2009/06/12/09380634/~Sains~Global%20Warming>

<sup>625</sup> Radja, A. M. (2011, May 11). *Enam Rekomendasi untuk Dorong Keadilan Iklim*. Retrieved from Antaranews: <https://www.antaranews.com/berita/258073/enam-rekomendasi-untuk-dorong-keadilan-iklim>

<sup>626</sup> Hamzah, Z. A. (2012, July 9). *LSM: Ekonomi Hijau Belum Selamatkan Lingkungan*. *Republika*, p. 12, Retrieved from <http://perpustakaan.menlhk.go.id/pustaka/images/docs/LSM%20Ekonomi%20Hijau%20KLIPING%20JULI%202012-8.pdf>

established DEN.<sup>627</sup> The 2014 KEN set more ambitious targets for new and renewable energy sources compared to the 2006 KEN, increasing the goal from 17 percent to at least 23 percent by 2025, and potentially to at least 31 percent if its economic value is met. Conversely, the coal target was slightly reduced from 33 percent in the 2006 KEN to 30 percent in the 2014 KEN.<sup>628</sup> However, the phrasing “*a minimum of 30 percent*” coal share by 2025 and “*a minimum of 25 percent*” coal share by 2050 again indicated no intention to halt coal use.<sup>629</sup>

In summary, the State deep involvement in the energy sector enabled institutional changes to be introduced through the agency of SBY as the president. The changes were implemented incrementally through layering mechanism, starting with the greater integration of the global climate change agenda into national policies. This mainstreaming subsequently exposed the energy sector to emission reduction imperatives, creating momentum for more committed development of renewable energy sources. This, however, did not change the prevailing pathway on fossil fuel use. On the contrary, the country’s coal production, use, and export increased during SBY’s presidency, both for economic and energy security reasons.

The energy sector during the SBY’s leadership was thus characterised by dual ambitions to develop renewable energy sources and to maintain fossil fuel reliance. The *State deep involvement in the energy sector* allowed it to make strategic choices regarding energy sources, with *its relationship with private companies* designed to achieve the State’s objective in the sector.

The implementation of energy policies in this post-authoritarian era is illustrated in the trend of primary energy supply shown in Figure 4.3. The figure clearly shows coal’s increasing share in

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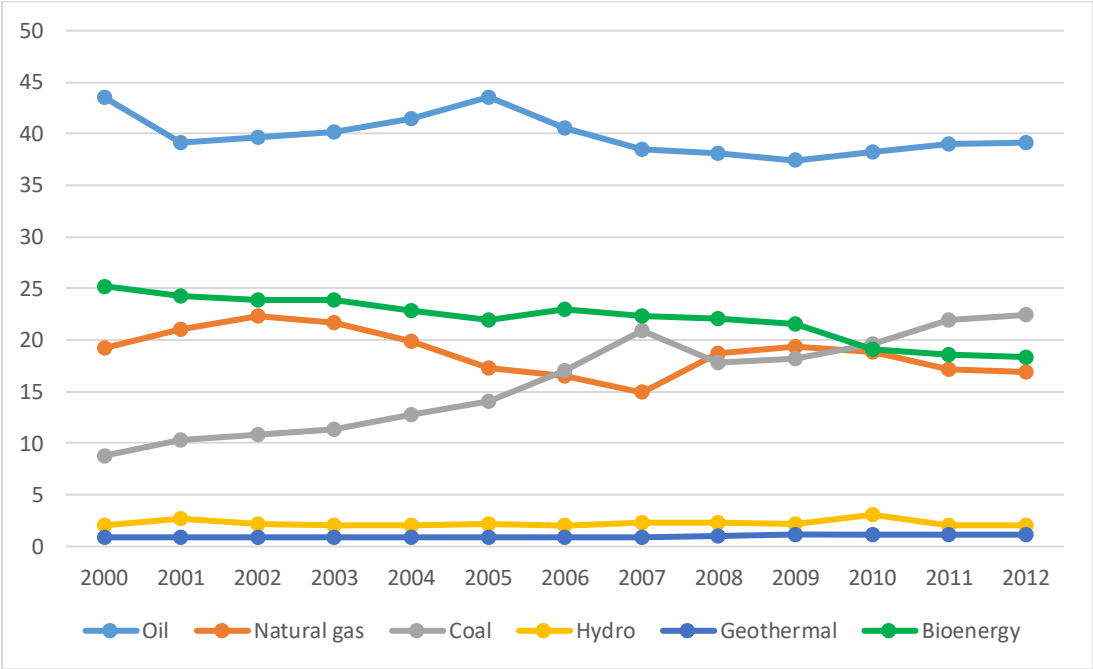
<sup>627</sup> Republic of Indonesia. (2014). *Peraturan Pemerintah Republik Indonesia Nomor 79 Tahun 2014 tentang Kebijakan Energi Nasional*. Retrieved from <https://jdih.esdm.go.id/peraturan/PP%20No.%2079%20Thn%202014.pdf>

<sup>628</sup> Republic of Indonesia. *Peraturan Pemerintah Republik Indonesia Nomor 79 Tahun 2014 tentang Kebijakan Energi Nasional*.

<sup>629</sup> Emphases added.

mid-2000s during SBY’s presidency. It likewise demonstrates that newer types of renewable energy sources, like wind and solar power, were yet to be developed significantly in this period despite the various policies that were put in place during SBY era to encourage their expansion.

**Figure 4. 3: Indonesia’s Primary Energy Supply by Sources (%), 2000 to 2012**



Source: MEMR. (2008). *Handbook of Energy & Economic Statistics of Indonesia 2008*. Retrieved from <https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-economic-statistics-of-indonesia-2007-846h2h1.pdf> (for 2000 to 2006 data); MEMR. (2013). *2013 Handbook of Energy & Economic Statistics of Indonesia*. Jakarta: MEMR. Retrieved from <https://esdm.go.id/assets/media/content/content-handbook-of-energy-economic-statistics-of-indonesia-2013-997ndnz.pdf> (for 2007 to 2012 data).

#### 4.6. Renewable Energy Development Era (2014 to 2024)

Joko Widodo, who succeeded SBY in 2014, inherited the two-pronged approach established during SBY’s 10-year leadership. The following year, the COP21 took place and saw the formulation of the landmark Paris Agreement, where developing countries, including Indonesia, stepped forward and pledged their commitment to reducing emissions for the first time. The

country's signing of the Paris Agreement, which aimed to limit temperature rise below 1.5°C by the end of the century, thus marked a potential critical juncture in the energy sector.

As part of the COP21 protocol, Indonesia formulated and submitted its Nationally Determined Contribution (NDC) to the UNFCCC Secretariat. The NDC was built on what SBY had previously pledged at the G20 meeting in Pittsburgh in 2009,<sup>630</sup> thereby marking a path dependence, evidenced by the NDC's vision to reduce emissions by 29 percent from 2020-2030, and up to 41 percent conditional upon international assistance.<sup>631</sup> Indonesia subsequently ratified the 2015 Paris Agreement in Law no. 16 year 2016<sup>632</sup> and identified forestry, energy and transportation, waste, industrial processes and product utilisation, and agriculture as sectors subject to mitigation measures. The scope of actions closely resembled those identified during SBY's presidency, further highlighting a path dependence.

Following the 2015 Paris Agreement, the 2014 KEN signed by SBY towards the end of his presidency was subsequently operationalised in greater detail in the 2017 National Energy Development Plan (Rencana Umum Energi Nasional/RUEN) during Jokowi's era. Legalised in Government Regulation No. 22 on Year 2017,<sup>633</sup> the 2017 RUEN demonstrated a greater awareness of the need to mitigate emissions in the energy sector. Although the energy sector had been subjected to emission mitigation measures in the previous policies, the 2017 RUEN was the first energy policy document to explicitly detail a strategy for greenhouse gas emission mitigation

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<sup>630</sup> Alisjahbana, A. S., and Busch, J. M. (2017). Forestry, Forest Fires, and Climate Change in Indonesia. *Bulletin of Indonesian Economic Studies*, (53)(2), 111 – 136.

<sup>631</sup> Republic of Indonesia. (2022). *Enhanced Nationally Determined Contribution Republic of Indonesia*. Retrieved from <https://unfccc.int/sites/default/files/NDC/2022-09/ENDC%20Indonesia.pdf>

<sup>632</sup> Republic of Indonesia. (2016). *Law No 16 Year 2016 on the Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change*. Retrieved from <https://peraturan.bpk.go.id/Home/Details/37573>

<sup>633</sup> Republic of Indonesia. (2017). *Peraturan Presiden Republik Indonesia Nomor 22 tahun 2017 tentang Rencana Umum Energi Nasional*. Retrieved from <https://www.esdm.go.id/assets/media/content/content-rencana-umum-energi-nasional-ruen-1.pdf>

in the sector. This included energy diversification through increased use of renewable energy sources, decreased use of fossil fuels, and energy conservation.

Importantly, the 2017 RUEN prioritised maximising renewable energy development, followed by minimising oil use, and optimising natural gas and new energy such as hydrogen, coal bed methane, liquified coal, and gasified coal. It placed coal use as a last resort, envisioning its use only as a backup if other energy sources were not able to meet domestic energy demand. The shift towards favouring renewable energy development reflected a promising start for low-carbon energy transition.

At the same time, however, the two-pronged approach remained in place as the document did not envision a complete fossil fuel phase-out. Natural gas was to be used as bridge fuel. In addition, while the relative share of coal in the primary energy supply mix was projected to decrease from 30 percent in 2025 to 25.3 percent in 2050, its absolute volume was expected to increase from 119.8 MTOE in 2025 to 255.9 MTOE in 2050. Furthermore, its use was to be expanded not only for electricity generation, but also in household, industrial and commercial sectors in the form of synthetic gas, Dimethyl Ether (DME) and briquette. DME is deemed a cleaner and viable alternative fuel to petroleum. Compared to other alternative fuels like methane, methanol, and ethanol, DME emits less polluting materials and does not pose major concerns relating to toxicity, production, infrastructure and transportation.<sup>634</sup> DME can support a wide range of applications including as a substitute of Liquefied petroleum gas (LPG) for cooking, as an alternative to diesel fuel in vehicles and small-scale electricity generation, a substitute of chlorofluorocarbon (CFC), Freon and R-134 for aerosol propellant, as a feedstock in chemicals, as solvent, kiln fuel for

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<sup>634</sup> Semelsberger, T.A., Borup, R.L. and Greene, H.L. (2006). Dimethyl Ether (DME) as An Alternative Fuel. *Journal of Power Sources*, (156)(2), 497 – 511.

ceramics, and for welding, cutting and brazing purposes.<sup>635</sup> Coal briquettes can be used in households as a cleaner cooking fuel compared to unprocessed coal as it emits lesser pollutants.<sup>636</sup> Moreover, the document continued to acknowledge the economic importance of coal exports through foreign exchange revenue. Coal export indeed remained significant in Jokowi era, amounting to about 80 percent of total coal production in 2015.<sup>637</sup> In addition, domestic coal demand was set to increase to support the new coal power plants that were included in Jokowi's plan to build 35GW of additional power capacity.<sup>638</sup>

The document's shift towards a greater emphasis on renewable energy therefore represented a layering mechanism. The Paris Agreement did not turn into a critical juncture because the State under Jokowi's leadership opted to continue using fossil fuels while gradually strengthening its commitment to transition to low-carbon energy sources. Although the Paris Agreement did not serve as a critical juncture, it played an important role in catalysing the shift, along with government officials' own awareness of climate consequences.<sup>639</sup> Indonesia's adherence to the global push for low-carbon energy transition, despite coal's ongoing contribution to the country's economy and energy security, underscored its commitment to being a responsible global citizen.<sup>640</sup>

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<sup>635</sup> Mondal, U. and Yadav, G.D. (2019). Perspective of Dimethyl Ether as Fuel: Part I. Catalysis. *Journal of CO<sub>2</sub> Utilization*, 32, 299 – 320.

<sup>636</sup> See: Das, D., Qadri, A., Tak, P., and Gupta, T. (2022). Effect of Processing on Emission Characteristics of Coal Briquettes in Cookstoves. *Energy for Sustainable Development*, 69, 77 – 86; Zhi, G., Chonghu Peng, C., Chen, Y., Liu, D., Sheng, G., and Fu, J. (2009). Deployment of Coal Briquettes and Improved Stoves: Possibly an Option for both Environment and Climate. *Environmental Science & Technology*, (43)(15), 5586 – 5591.

<sup>637</sup> Lucarelli. *The History and Future of Indonesia's Coal Industry*.

<sup>638</sup> MEMR. (2015, May 4). *Peluncuran Program Pembangunan Pembangkit 35.000 MW*. Retrieved from <https://www.esdm.go.id/id/media-center/arsip-berita/peluncuran-program-pembangunan-pembangkit-35000-mw>

<sup>639</sup> Interview with Dr Satya Widya Yudha, Member, National Energy Council (Dewan Energi Nasional/DEN), in Jakarta, 26 January 2023.

<sup>640</sup> Interview with Y. W. Junardy, President, Indonesia Global Compact Network in Jakarta, 3 February 2023.

The mainstreaming of climate issues that SBY started during his presidency evidently paved the way for a convergence between increasing global pressure for climate action and the disposition of the State under Jokowi's leadership towards the low-carbon energy transition agenda. Mr Hageng Suryo Nugroho, an Expert Staff at the Presidential Staff Office, corroborated this observation by emphasising that the Indonesian government fully understands, supports, and follows the global shift towards sustainability, and is committed to the low-carbon energy transition agenda with or without global pressure.<sup>641</sup> This commitment was demonstrated, for example, in the significant reduction of fuel subsidy in 2014 towards the end of SBY's era, which was further reduced during Jokowi's presidency. Furthermore, Jokowi's announcement at the COP26 in Glasgow in 2021, declaring Indonesia's goal to achieve carbon neutrality by 2060, further underscored this commitment.

### **The Parliament and the Drafting of New and Renewable Energy Law**

A similar effect of the combination between the increasing global pressure for climate mitigation and the growing awareness of climate issue was seen in the eventual drafting of a special law on renewable energy in 2019, twelve years after the plan to develop renewable energy sources was encapsulated in the 2007 Energy Law. This observation was corroborated by Mr Aristia Hady Wanjaya, an expert staff member at the Commission VII, who asserted that the push for new and renewable energy<sup>642</sup> bill was driven neither by political agendas nor the economic interests of the Commission VII members.<sup>643</sup> Not only there was little lobbying from the renewable energy sector, but also there was little business interest among the Commission VII members, given that only a few were involved in operating new and renewable energy power plants.<sup>644</sup> Instead, their

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<sup>641</sup> Interview with Hageng Suryo Nugroho, Expert Staff, Presidential Staff Office in Jakarta, 25 January 2023.

<sup>642</sup> The term 'new and renewable energy' denotes the inclusion of nuclear energy and coal derivatives as new energy sources, in addition to wind and solar energy, among others, as renewable energy sources.

<sup>643</sup> Interview with Aristia Hadi Wanjaya, Expert Staff, Commission VII of the Parliament based in Jakarta, 30 August 2021.

<sup>644</sup> Wanjaya, A. H. Interview. 2021.

motivation stemmed from their awareness and knowledge of climate change and their personal experiences with the benefits of new and renewable energy in their electoral areas, especially in villages.

The important role of growing awareness on climate issues in driving the drafting of a special renewable energy bill was further confirmed by Mr Sugeng Suparwoto, the Head of the Commission VII, who showcased his deep understanding of climate change and his personal conviction of the energy sector's contribution to global warming. He elaborated that Indonesia has already experienced the impacts of climate change, such as increased flooding in Jakarta and saline intrusion in northern shores of Java Island, and referring to the 2015 Paris Agreement, Mr Suparwoto emphasised that the development of new and renewable energy has reached a point of no return, marking a definitive trajectory towards a low-carbon energy transition that rendered a drafting of such law in Indonesia inevitable.<sup>645</sup>

Despite progress in favour of renewable energy development, the persistence of the two-pronged approach hindered its accelerated expansion. Mr Suparwoto revealed that there was strong pushback from fossil fuel players against the efforts to draft the new and renewable energy bill, leading to the Commission VII negotiating with the fossil fuel industry to find compromises. Among such compromises was a gradual coal phase-out instead of an immediate one.<sup>646</sup> For example, efforts to reduce coal use began with the mixing of renewable energy sources and coal, often referred to as co-firing, in existing coal power plants before progressively transitioning to renewable energy sources only. The use of gas during the transition period was also part of the compromise.

The reason for maintaining fossil fuel use despite a greater commitment to reducing emissions in the energy sector has been subject to debate. According to Ordonez et al., the rise of domestic

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<sup>645</sup> Interview with Sugeng Suparwoto, Head, Commission VII of the Parliament, based in Jakarta, 2 September 2021.

<sup>646</sup> Suparwoto, S. Interview. 2021.

players in the coal sector in the early 2000s transformed them to a coal oligarchy who wielded significant influence on Jokowi's presidency, as evidenced in the involvement of energy and mining business owners in key political appointments.<sup>647</sup> The presence of coal moguls Luhut Binsar Pandjaitan and Erick Thohir in Jokowi's cabinet granted them strong lobbying positions to favour their interests.<sup>648</sup> The plan to diversify coal into synthetic gas, DME and briquettes, which was to be classified as new energy sources in the upcoming renewable energy bill, was perceived as an intention to perpetuate coal use and protect the coal industry's interests.<sup>649</sup> Additionally, the passage of Law No. 3 Year 2020 on Mineral and Coal Mining,<sup>650</sup> which essentially guaranteed coal mining contract extensions upon expiry, was regarded as an effort to preserve coal use.

### **Coal Industry and Low-Carbon Energy Transition Agenda**

Mr Hendra Sinadia, the Executive Director of the Indonesian Coal Mining Association (Asosiasi Pertambangan Batubara Indonesia/APBI), contested such observations by emphasising that the coal industry was not in a position to shape government policies; rather, it saw itself as a government contractor responding to government's energy directives.<sup>651</sup> Mr Sinadia underscored that the plan to develop new coal products like the DME originated from the government, not the coal industry, and highlighted that the coal industry approached this plan with trepidation given its lack of expertise in producing such products and was uncertain about its profitability.<sup>652</sup> With regard to Law No. 3 Year 2020 on Mineral and Coal Mining, the main purpose of lobbying was to ensure that the State honoured its promise of coal mining contract extensions for two periods of

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<sup>647</sup> Ordonez, et al. *Coal, Power and Coal-Powered Politics in Indonesia*.

<sup>648</sup> Mustasya, T. Interview. 2021.

<sup>649</sup> Tumiwa, F. Interview. 2021.

<sup>650</sup> Republic of Indonesia. (2020). Undang-undang Republik Indonesia Nomor 3 tahun 2020 tentang Perubahan atas Undang-undang Nomor 4 tahun 2009 tentang Pertambangan Mineral dan Batubara. Retrieved from <https://jdih.esdm.go.id/storage/document/UU%20No.%203%20Thn%202020.pdf>

<sup>651</sup> Interview with Hendra Sinadia, Executive Director, Indonesian Coal Mining Association (Asosiasi Pertambangan Batubara Indonesia/APBI) based in Jakarta, 25 January 2021.

<sup>652</sup> Sinadia, H. Interview. 2021.

10 years each that it made to the coal industry 30 years ago. From the industry's perspective, the passage of this Law was intended to safeguard its rightful interests, and did not constitute a deliberate effort to preserve coal use or hinder renewable energy development.

The reference to the State's promise made three decades ago confirms a path dependence on coal use, which was linked to electricity generation by state-owned PLN since the Soeharto era. PLN's longstanding reliance on coal for power generation had thus made it challenging for the company to swiftly transition to renewable energy facilities at a massive scale, despite calls from stakeholders to expand renewable energy usage.<sup>653</sup> Several factors contribute to this complexity, including existing contracts for coal power plant projects, grid overcapacity in Java-Bali transmission due to a slump in electricity demand during the Covid-19 pandemic, a lack of grid connectivity nationwide, and more importantly, PLN's dual mandate of maintaining affordable electricity prices while ensuring profitability.<sup>654</sup> The PLN had to navigate these challenges<sup>655</sup> in its business planning, project tendering, and operational strategies. As a dominant player in the electricity sector, the PLN's decisions played an instrumental role in influencing renewable energy expansion in the country. In other words, the PLN's operational constraints created a bottleneck in the low-carbon energy transition,<sup>656</sup> with renewable energy targets taking a backseat amidst the various challenges that the PLN faced. While these issues were not insurmountable, resolving them required time and inadvertently caused a delay in renewable energy development, further reinforcing the continued use of coal in the energy sector.

The private sector's claim on its position as a government partner was likewise substantiated, given a path dependence on State deep involvement in the energy sector and the private sector's

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<sup>653</sup> Interview with a senior official in the energy sector in Jakarta, 2 February 2023.

<sup>654</sup> Interview with a senior management of P.T. Vena Energy Indonesia in Jakarta, 20 January 2023.

<sup>655</sup> State-owned PLN holds the mandate to keep the prices low and acts as a gatekeeper that ensures affordable electricity prices for consumers.

<sup>656</sup> P.T. Vena Energy Indonesia senior management. Interview. 2023; and Interview with a senior management of P.T. UPC Renewable Energy Indonesia based in Jakarta, 9 January 2023.

supporting role to achieve State's strategic visions. Like Mr Sinadia, Mr Nugroho also repudiated any views suggesting purposeful efforts to retain coal use to protect the interests of the powerful coal group, allegedly linked the current Jokowi presidency, and emphasised on its role in meeting the country's energy security needs instead.<sup>657</sup> This signifies that energy security considerations underpinned the choice of energy sources in Indonesia, even if there was an overlap between the interests of coal oligarchs and the State's energy security agenda.

In view of energy security, cost was a significant factor contributing to the State's persistence on the two-pronged approach. Although Indonesia never opposed global agreements on environmental issues, cost had been a major stumbling block to their implementations given that the basic philosophy governing the energy sector in Indonesia had always been the least cost principle.<sup>658</sup> Not only cost presented a sensitive electoral issue with high political risks for the government, it was also an important element in energy supply and affordability.

Coal power generation remained the cheapest option compared to oil, gas, and renewable sources at the time of this dissertation writing. Renewable energy projects in Indonesia were expensive due to their small outputs and high initial costs. Project sizes were typically around 20MW in Indonesia, whereas in Malaysia they could reach 500MW, and even up to 1500MW in the Philippines.<sup>659</sup> Limited availability of vast swathes of land necessary for building large-scale renewable energy facilities<sup>660</sup> near populous areas like Java, Bali, and Sumatra islands was part of the reason behind the prevalence of small-scale projects in Indonesia. Vast lands were available in less inhabited areas or islands, typically in Eastern part of Indonesia, but building large-scale renewable facilities in those regions would have potentially driven up the overall tariffs due to transmission costs to demand centres in western part of Indonesia in Java, Bali and Sumatra

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<sup>657</sup> Nugroho, H. S. Interview. 2023.

<sup>658</sup> Yusgiantoro, P. Interview. 2023.

<sup>659</sup> P.T. Vena Energy Indonesia senior management. Interview. 2023.

<sup>660</sup> Sambodo, M. T. Interview. 2023.

islands, thereby making them uneconomical for consumers and potentially unviable for businesses.

### **State and the Use of Coal**

A senior official in the energy sector confirmed that while Indonesia was aware of the global decline in wind and solar energy costs, coal was still seen as the cheaper option,<sup>661</sup> given that its cost of electricity supply (Biaya Penyediaan Pokok/BPP) remained lower than renewable energy sources.<sup>662</sup> The dilemma lied in the high upfront capital of renewable energy development, which would necessitate substantial subsidies to make it competitive with coal. Such subsidy requests, however, were likely to face objections from the Ministry of Finance.<sup>663</sup> On the other hand, if renewable energy were to be given a low tariff comparable to coal, private developers would be dissuaded from committing to the projects given the impact on their profitability. A senior official at PLN corroborated this observation, noting that renewable energy expansion would certainly increase prices and add extra subsidy burden on the State if total tariffs were to be maintained at their current levels.<sup>664</sup> Not only were cost-related challenges difficult to overcome, the preference for fossil fuels persisted due to their leading role in supporting economic growth.

The perception that coal was the cheaper option was shared not only among government officials but also the public. Mr Novan Putranto, a senior journalist covering the Indonesian energy sector, confirmed that, precluding social and environmental externalities, coal was indeed less expensive.<sup>665</sup> Mr Paul Butarbutar, the Executive Director of the Indonesian Renewable Energy Society (Masyarakat Energi Terbarukan Indonesia/METI), also emphasised that economic

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<sup>661</sup> Energy sector senior official. Interview. 2023.

<sup>662</sup> Interview with a senior official at the Directorate General of New and Renewable Energy and Energy Conservation (Energi Baru Terbarukan dan Konservasi Energi/EBTKE), the Ministry of Energy and Mineral Resources of the Republic of Indonesia, in Jakarta, 25 January 2023.

<sup>663</sup> EBTKE senior official. Interview. 2023.

<sup>664</sup> Interview with a senior official at the PLN in Jakarta, 24 January 2023.

<sup>665</sup> Interview with Novan Putranto. Journalist. CNBC Indonesia, based in Jakarta, 2021.

factors, most notably cost, was the defining factor in the energy sector.<sup>666</sup> According to him, regardless of policy commitment to develop new and renewable energy sources, coal use was still prioritised, especially when operational challenges arise. For example, during the Covid-19 pandemic, when electricity generation exceeded demand and caused grid capacity overload, coal-generated electricity was prioritised over renewable sources to enter the grids because it made business sense for state-owned PLN to do so in view of its take-or-pay obligations, which necessitated the PLN to make payments to independent power producers even if consumers did not use the electricity they generated.<sup>667</sup> Ms Elrika Hamdi, a finance analyst at the Institute for Energy Economics and Financial Analysis (IEEFA), confirmed that the perception of coal being the cheapest source of energy was the main reason for its continued use.<sup>668</sup> Mr Norman Harsono, a journalist covering the Indonesian energy sector, projected that Indonesia was likely to continue using coal despite increasing awareness of sustainability issues.<sup>669</sup>

Cost was thus an important factor reinforcing a path dependence on its use. Beyond cost concerns, coal's performance in electricity generation further entrenched its continued use, given that renewable energy technologies still lacked the maturity and the feasibility required to produce electricity at a scale comparable to coal.<sup>670</sup> Unlike coal, which baseload characteristic can provide stability, the intermittent characteristic of renewable energy sources made them less reliable.<sup>671</sup> In terms of performance, therefore, coal remained a superior choice.

At this juncture, it is evident that coal use was intricately linked to the country's energy security. To ensure an affordable coal supply, the government imposed the Domestic Market Obligation

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<sup>666</sup> Interview with Paul Butarbutar. Executive Director. Masyarakat Energi Terbarukan Indonesia (METI), based in Jakarta, 6 May 2021.

<sup>667</sup> Butarbutar. P. Interview. 2021.

<sup>668</sup> Interview with Elrika Hamdi. Finance Analyst. Institute for Energy Economics and Financial Analysis (IEEFA), based in Jakarta, 27 January 2021.

<sup>669</sup> Interview with Norman Harsono. Journalist. The Jakarta Post, based in Jakarta, 10 January 2021.

<sup>670</sup> Interview with Rafli Yandra, Director of Business Development, PT. Bukit Asam (Persero) Tbk, based in Jakarta, 20 January 2023.

<sup>671</sup> Yudha, S. W. Interview. 2023.

(DMO) and the Domestic Price Obligation (DPO) on coal companies.<sup>672</sup> These obligations mandated a certain volume of coal to be made available in the domestic market at a price capped at USD70 per tonne. The State's intervention in pricing arguably further reinforced a path dependence on coal use by potentially masking its true cost, which may fluctuate overtime, thereby sustaining the perception of coal as consistently affordable.

As in the coal industry, the *State deep involvement* in renewable energy development allowed for significant intervention. This was evident in the setting of additional agenda aimed at deriving economic benefits from renewable energy development, beyond the primary goal of increasing its share in the energy mix. For example, the government and state-owned PLN were exploring ways to transform renewable energy development from a cost centre to a revenue generator.<sup>673</sup> This included plans to establish a new industrial base for renewable energy technologies and integrate Indonesia into the global battery and electric vehicle supply chain. Furthermore, the Indonesian Ministry of Industry has issued a regulation requiring a certain percentage of components produced domestically (Tingkat Komponen Dalam Negeri/TKDN) in new renewable energy projects.<sup>674</sup>

These additional agendas inevitably introduced extra layers of complexity that could slow down the country's renewable energy expansion and justify continuing fossil fuel use. For example, the vision to develop battery industry in Indonesia was challenging because the mandated construction of smelters under Law no. 4 year 2009 had not yet materialised given investment constraints.<sup>675</sup> In addition, the TKDN requirement drove up overall costs because imported items

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<sup>672</sup> P.T. Vena Energy Indonesia senior management. Interview. 2023.

<sup>673</sup> Nugroho, H. S. Interview. 2023.

<sup>674</sup> See for example: Ministry of Industry. (2017). *Peraturan Menteri Perindustrian Republik Indonesia Nomor 04/M-IND/PER/2/2017 on Ketentuan dan Tata Cara Penilaian Tingkat Komponen Dalam Negeri untuk Pembangkit Listrik Tenaga Surya*. Retrieved from <https://peraturan.go.id/files/bn274-2017.pdf>

<sup>675</sup> Yugianoro, P. Interview. 2023.

were cheaper.<sup>676</sup> Consequently, the PLN needed, at times, to appeal or negotiate the TKDN requirements to enable the completion of its renewable energy projects.<sup>677</sup>

### **CSOs in Low-Carbon Energy Transition Agenda**

Like it was in the SBY era, Jokowi's two-pronged approach faced opposition from CSOs. They employed various strategies, with deliberate efforts to obstruct coal use remaining an important tactic. For instance, in 2017, Walhi, a prominent environmental CSO whose origins dated back to the Soeharto era, released a statement addressed to President Jokowi, urging him to stop activities related to the construction of the Indramayu 2 coal power plant, which was part of Jokowi's 35GW power plant building projects.<sup>678</sup> The problems highlighted include grid overcapacity (which referred to electricity generation oversupply due to temporary lower demand as seen during the Covid-19 pandemic), the take-or-pay scheme,<sup>679</sup> and human rights issues associated with coal use<sup>680</sup> including health impacts due to polluting materials generated by coal mining activities and coal power plants,<sup>681</sup> water pollution affecting day-to-day life and land use conflicts with housing and livelihood activities such as farming.<sup>682</sup>

Walhi also challenged local governments. For example, it held a press conference in response to the Central Java government's plan to build new power plants, emphasising the environmental

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<sup>676</sup> EBTKE official. Interview. 2023.

<sup>677</sup> Senior official in the energy sector. Interview. 2023.

<sup>678</sup> WALHI (Wahana Lingkungan Hidup Indonesia). (2017, January 13). *Kekerasan Infrastruktur PLTU Indramayu 2, Jepang Harus Menghentikan Investasi Energi Kotor*. Retrieved from <https://www.walhi.or.id/kekerasan-infrastruktur-pltu-indramayu-2-jepang-harus-menghentikan-investasi-energi-kotor>

<sup>679</sup> WALHI. (2018, July 17). *Proyek Energi Kotor PLTU Batubara Sarat Korupsi dan Membangkrutkan Negara*. Retrieved from <https://www.walhi.or.id/proyek-energi-kotor-pltu-batubara-sarat-korupsi-dan-membangkrutkan-negara>

<sup>680</sup> WALHI. (2018, August 1). *Stop Energi Kotor Batubara, Hentikan Kriminalisasi Pejuang Lingkungan Hidup*. Retrieved from <https://www.walhi.or.id/stop-energi-kotor-batubara-hentikan-kriminalisasi-pejuang-lingkungan-hidup>

<sup>681</sup> Morrice, E. and Colagiuri, R. (2013). Coal Mining, Social Injustice and Health: A Universal Conflict of Power and Priorities. *Health & Place*, 19, 74 – 79.

<sup>682</sup> Nasir, M. (2023). Coal Mining Operations and Environmental Rights Violations in the East Kalimantan Province, Indonesia. In S. Foster, B. Stanford, and M. Vanhullebusch (eds.) *The Asian Yearbook of Human Rights and Humanitarian Law, Volume: 7*. Leiden: Koninklijke Brill NV, 241 – 267.

impact including pollution, health problems, and the effects on coastal ecosystem and fishermen.<sup>683</sup> Walhi also targeted the Sumber Segara Primadaya (S2P) coal power plant in Cilacap, and demanded local government of the Cilacap regency to act on it.<sup>684</sup>

In addition, Walhi took part in demonstrations. In the lead-up to the COP23 in 2017, it organised a workshop on climate justice,<sup>685</sup> and participated in demonstrations in Fiji to demand an end to coal use together with other CSOs.<sup>686</sup> Walhi also protested against the 24<sup>th</sup> Coaltrans Asia conference held in Bali in 2018 and filed a legal suit against the Ministry of Energy and Mineral Resources in the civil service arbitration tribunal (PTUN) Jakarta for issuing production permit to PT. Mantimin Coal Mining (PT. MCM).<sup>687</sup> Furthermore, it protested against coal power plants Jawa 9 and Jawa 10 in 2020.<sup>688</sup>

CSOs also sought to engage the broader public through creative means such as filmmaking. The 2019 documentary *Sexy Killers* showcased the negative repercussions of coal use in electricity generation, and the alleged involvement of the coal oligarchs in the government. The documentary narrative indirectly suggested abuse of power and collusion between the rich and powerful to secure their economic benefits at the expense of the poor, the weak, and the ordinary

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<sup>683</sup> WALHI. (2017, February 15). *Konflik Energi untuk Penataan Ruang Jawa Tengah*. Retrieved from <https://www.walhi.or.id/konflik-energi-untuk-penataan-ruang-jawa-tengah>

<sup>684</sup> WALHI (Wahana Lingkungan Hidup Indonesia). (2019, July 24). *Cilacap Tolak Energi Kotor Batubara “Menuntut Hak Atas Lingkungan Hidup yang Baik.”* Retrieved from <https://www.walhi.or.id/cilacap-tolak-energi-kotor-batubara-menuntut-hak-atas-lingkungan-hidup-yang-baik>

<sup>685</sup> WALHI. (2017, September 11). *Lokakarya Keadilan Iklim dalam Kebijakan Adaptasi and Mitigasi Perubahan Iklim di Sektor Energi; Respon Jelang COP 23 Bonn*. Retrieved from <https://www.walhi.or.id/lokakarya-keadilan-iklim-dalam-kebijakan-adaptasi-dan-mitigasi-perubahan-iklim-di-sektor-energi-respon-jelang-cop-23-bonn>

<sup>686</sup> WALHI. (2017, November 6). *Hentikan Solusi Palsu Perubahan Iklim, Tinggalkan Energi Fosil*. Retrieved from <https://www.walhi.or.id/hentikan-solusi-palsu-perubahan-iklim-tinggalkan-energi-fosil>

<sup>687</sup> WALHI. (2018, May 9). *In Various Regions, WALHI Mobilized against Dirty Energy*. Retrieved from <https://www.walhi.or.id/in-various-regions-walhi-mobilized-against-dirty-energy>

<sup>688</sup> WALHI. (2020, June 25). *Presiden Moon, Energi Kotor PLTU Jawa 9-10 Bukan Kesepakatan Hijau Baru!* Retrieved from <https://www.walhi.or.id/presiden-moon-energi-kotor-pltu-jawa-9-10-bukan-kesepakatan-hijau-baru> ; and WALHI (Wahana Lingkungan Hidup Indonesia). (2020, October 27). *Peringatan Hari Listrik Nasional: Banten Dikepung PLTU Batubara, Beralih ke Energi Bersih Sekarang Juga!* Retrieved from <https://www.walhi.or.id/peringatan-hari-listrik-nasional-banten-dikepung-pltu-batubara-beralih-ke-energi-bersih-sekarang-juga>

citizens, thereby provoking antipathy against coal use and generating support for renewable energy.

The director of *Sexy Killers*, Mr Dandhy Laksono, stated that his film, which garnered 37 million views on Youtube as of August 2023, was quite successful in raising public awareness about coal use.<sup>689</sup> He claimed that the film helped to shape anti-coal and pro-renewable narratives even among government officials and technocrats who previously viewed coal as the cheapest energy source. Although the film did not immediately translate to policy changes, it made it increasingly difficult to openly support coal and maintain that coal was the most affordable energy source, especially after factoring in socio-environmental costs.

In addition to aggressive campaigns, CSOs also employed softer approaches. Greenpeace Indonesia collaborated with Udayana University in Bali for research on solar energy, motivating the Bali Governor to gradually phase out coal and replace it with solar, while also engaging high school students in energy transition projects<sup>690</sup> and conducting research and published reports on topics like the ‘true cost of coal.’<sup>691</sup> Other indirect engagements included educational initiatives targeting youth groups,<sup>692</sup> research and publications discrediting coal<sup>693</sup> while promoting renewable energy,<sup>694</sup> and workshops on climate-related topics.<sup>695</sup>

Another method was to forge a more cordial and mutually supportive relationship with the State. The METI and the Electricity Society of Indonesia (Masyarakat Kelistrikan Indonesia/MKI)

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<sup>689</sup> Interview with Dandhy Laksono, Documentary Producer at Watchdoc Indonesia based in Jakarta, 16 February 2021.

<sup>690</sup> Greenpeace Southeast Asia. *Sounding the Alarm: Annual Report 2019*.

<sup>691</sup> Greenpeace Southeast Asia. (n.d.a). *2014 Annual Report*. Retrieved from <https://www.greenpeace.org/static/planet4-southeastasia-stateless/2019/04/0a113428-0a113428-annualreport2014.pdf>

<sup>692</sup> WALHI. (2018, November 26). *40 Pemuda Jawa Tengah Terlibat Pendidikan Perubahan Iklim dan Energi Bersih Terbarukan Bersama WALHI Jawa Tengah*. Retrieved from <https://www.walhi.or.id/40-pemuda-jawa-tengah-terlibat-pendidikan-perubahan-iklim-dan-energi-bersih-terbarukan-bersama-walhi-jawa-tengah>

<sup>693</sup> Greenpeace Southeast Asia. *2014 Annual Report Greenpeace*.

<sup>694</sup> Greenpeace Southeast Asia. *Sounding the Alarm: Annual Report 2019*.

<sup>695</sup> Walhi. *Lokakarya Keadlian Iklim dalam Kebijakan Adaptasi and Mitigasi Perubahan Iklim di Sektor Energi*.

partnered up with state-owned PLN to provide the company with feedback and assist it in evaluating and formulating policies.<sup>696</sup> Similarly, the Institute for Essential Services Reform (IESR) and the METI worked with the EBTKE to provide progressive and useful inputs. Despite being aware of CSOs' possible subjective agendas, the EBTKE found these interactions mutually reinforcing.<sup>697</sup> Another example of synergy between the State and the CSOs was with IBEKA, a CSO founded by Ms. Tri Mumpuni, which has helped expand micro-hydro facilities in rural areas in Indonesia.<sup>698</sup>

Despite Indonesia's thriving civil society and their numerous initiatives to stop fossil fuels and advance renewable energy, the State maintained its authority in the energy sector. For example, CSOs campaigned against coal financing, with Greenpeace Indonesia re-directing funds from coal to renewable energy and attempting to disrupt coal power plant project financing.<sup>699</sup> However, the campaigns to shame coal financiers had not been successful in Indonesia,<sup>700</sup> thereby signaling some limitations on CSOs' influence. The State's tight grip on the energy sector despite CSOs opposition was attributed to factors such as weak bottom-up pressure given that members of the public tended to prioritise energy supply and affordability over sustainability issues,<sup>701</sup> and the largely government-controlled media that often failed to critically scrutinise new power plant projects.<sup>702</sup>

CSOs' limited influence was also evident in the drafting of the special renewable energy bill, despite their involvement in the drafting process. For example, the METI and the IESR were invited to a Focus Discussion Group organised by WWF Indonesia to exchange views about the

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<sup>696</sup> PLN senior official. Interview. 2023.

<sup>697</sup> EBTKE official. Interview. 2023.

<sup>698</sup> Yusgiantoro, P. Interview. 2023.

<sup>699</sup> Greenpeace Southeast Asia. *2015 Annual Report: Creating the Future We Want*.

<sup>700</sup> Interview with Binbin Mariana, Southeast Asia Energy Finance Analyst, Market Forces based in Jakarta, 21 January 2021.

<sup>701</sup> Interview with Indra Sari Wardhani, Former Climate and Energy Manager, WWF Indonesia based in Jakarta, 26 January 2021.

<sup>702</sup> Mustasya, T. Interview. 2021.

bill with the representatives of the Economic Coordinating Ministry and the Maritime Coordinating Ministry.<sup>703</sup> Similarly, the Parliament's Commission VII invited the METI, the MKI, the Female Coalition of Indonesia (Koalisi Perempuan Indonesia/KPI) and the Indonesian Civil Society Coalition for Clean Energy (Koalisi Masyarakat Sipil Indonesia untuk Energi Bersih) to provide feedback on the draft bill.<sup>704</sup> Regardless of their active participation, CSOs were unable to persuade the government and the Commission VII to exclude *new energy sources*, which refer to coal derivatives and nuclear source, from the draft renewable energy bill, despite their strong objection.<sup>705</sup>

The CSOs' limited ability to effect changes in the energy sector was further exacerbated by the changing nature of their engagement with the State. For example, Walhi was engaged by the Ministry of Energy and Mineral Resources, the National Planning Agency (Bappenas), and the DEN in drafting of the National Mid-term Development Plan (RPJMN), the National Energy Development Plan (RUEN), and the National Energy Policy (KEN).<sup>706</sup> Despite its access to government agencies and involvement in drafting government plans, the intensity and effectiveness of these engagements had fluctuated, as seen in Walhi no longer having a representative in DEN like it did before.

The State involvement in the energy sector significantly influenced the extent of CSOs' impacts, as it allowed the State to treat them differently depending on their types of activism. For example, the State had the tendency to value those CSOs that collaborated with the government, thereby granting them more influence to policymaking.<sup>707</sup> In contrast, CSOs that opposed coal use without

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<sup>703</sup> IESR (Institute for Essential Services Reform). (2019, April 11). *Masukan IESR tentang Badan Pengelola Energi Terbarukan dalam RUU Energi Baru dan Terbarukan*, Retrieved from <https://iesr.or.id/en/iesr-memberikan-masukan-tentang-badan-pengelola-energi-terbarukan-dalam-ruu-energi-baru-dan-terbarukan>

<sup>704</sup> (2020, September 18). *Pembahasan Draf RUU EBT: Koalisi Masyarakat Menyerukan Agar DPR Fokus Pada Energi Terbarukan*, Retrieved from <https://iesr.or.id/wp-content/uploads/2020/09/200906-Draf-Siaran-Pers-Koalisi-OMS-Energi-Bersih-1.pdf>

<sup>705</sup> Sawung, D. Interview. 2021.

<sup>706</sup> Sawung, D. Interview. 2021.

<sup>707</sup> Nugroho, H. S. Interview. 2023.

offering solutions were often regarded as making futile attempts.<sup>708</sup> This was especially relevant considering that the State already had plans to reduce coal use even if it could not be done immediately.<sup>709</sup> Furthermore, the State believed it was already in line with what CSOs were advocating for<sup>710</sup> as evidenced by Indonesia's alignment with global trends and frameworks such as the Energy Transition Mechanism (ETM) and the JETP.<sup>711</sup> Consequently, CSOs had limited space to influence policy changes, and their roles were more into accelerating transition and awareness raising, although in some instances their activism could have impacts at the operational level as seen, for example, in obstructing geothermal development.<sup>712</sup> Likewise, CSOs' voices mattered when it came to the use of nuclear source as they affected the acceptability and the societal readiness aspects that Indonesia must meet in accordance with the IAEA guidelines.

At the operational level, companies often anticipated CSOs objections by taking pre-emptive measures. For instance, P. T. Vena Energy Indonesia engaged with communities before and during project execution to understand their socio-environmental concerns, which was then followed-up by an observation after the completion of the project to assess the accuracy of the company's initial assessments.<sup>713</sup> Similarly, the company monitored the impact of wind blades on birds at its 72MW wind farm in Tolo in Jeneponto Regency of South Sulawesi Province. By making such anticipatory initiatives, the space for CSOs to lodge protests and introduce changes through their activism became constrained.

The implementation of energy policies in this period is illustrated in the trend of primary energy sources shown in Figure 4.4. It clearly shows coal's increasing share since the start of Jokowi's presidency in 2014, notably replacing oil, whose share was declining. The figure also shows

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<sup>708</sup> Yudha, S. W. Interview. 2023.

<sup>709</sup> Nugroho, H. S. Interview. 2023.

<sup>710</sup> Senior official in the energy sector. Interview. 2023.

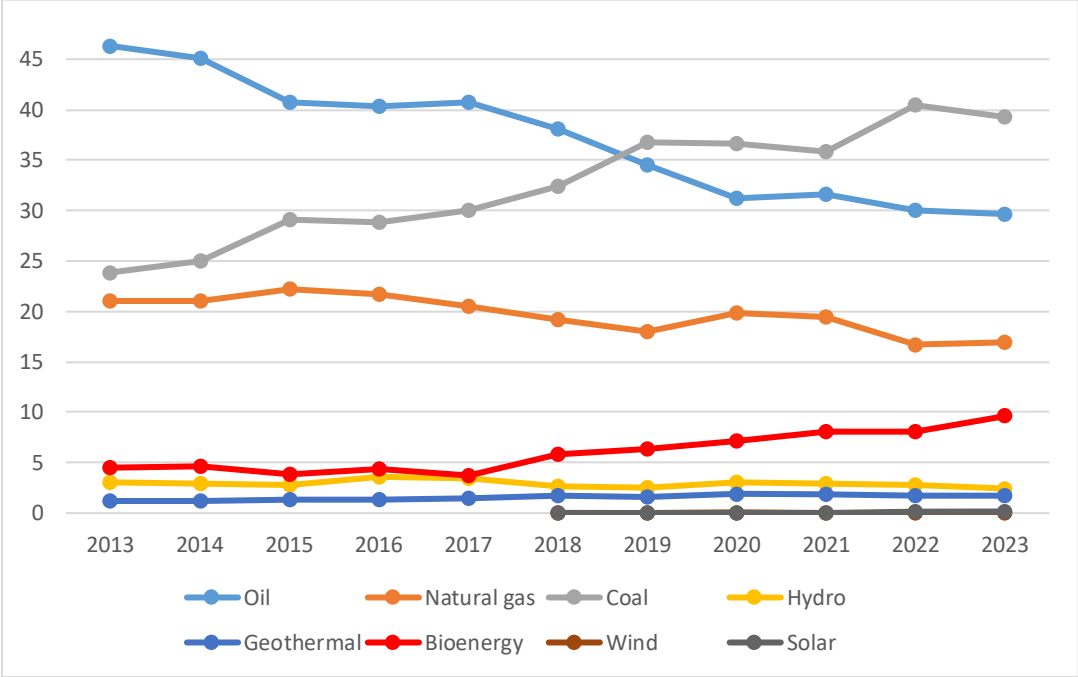
<sup>711</sup> Yudha, S. W. Interview. 2023.

<sup>712</sup> EBTKE senior official. Interview. 2023.

<sup>713</sup> P.T. Vena Energy Indonesia senior management. Interview. 2023.

increasing share of biofuel since 2018, along with solar power’s budding share that started in the same year.

**Figure 4. 4: Indonesia’s Primary Energy Supply by Sources (%), 2013 to 2023**



Source: MEMR. (2024). *Handbook of Energy & Economic Statistics of Indonesia 2023*.

At this juncture, it is evident that the path dependence on *State deep involvement in the energy sector* continues to play a critical role in setting the agenda forward for both fossil fuel use and renewable energy expansion. It is also apparent that the energy sector was held captive by the State’s strategic interests and priorities. This suggests that unless the State decisively channels its resources to facilitate renewable energy development and moves away from fossil fuels, Indonesia’s two-pronged approach is likely to get reinforced over time, rendering low-carbon energy transition progress elusive.

#### 4.7. Elusive Low-Carbon Energy Transition Progress

Such elusiveness is embodied in the anticipated continuing coal production and exports for at least the next three decades, driven by demand from Southeast Asian countries, China, India, Japan, South Korea and Taiwan.<sup>714</sup> Despite acknowledging the pressure to shift towards low-carbon energy sources and recognising coal demand's projected decline amid global energy transitions, the profit-driven coal industry maintained its right to adhere to the prevailing operating principle in the coal industry, which was to first maximise the use of coal reserves within contract periods while gradually transforming to downstream products (such as DME, synthetic gas, and briquettes) or diversifying business portfolios to include renewable energy sources.<sup>715</sup> This strategy reflected the extractive economy model that the State espoused,<sup>716</sup> thereby ensuring continued coal exports as long as there was demand in the international coal market.<sup>717</sup>

At the same time as maintaining coal use, the State also aimed to facilitate low-carbon energy transition through the Presidential Regulation no. 112 on the Acceleration of Renewable Energy Development for Electricity Generation, signed by President Jokowi in late 2022. Unlike earlier regulations, this 2022 Presidential Regulation included provisions for the early retirement of existing coal power plants and the ban on new coal power plants.<sup>718</sup> These provisions presented a promising development for low-carbon energy transition,<sup>719</sup> and was expected to improve investor confidence and enhance Indonesia's investment climate for renewable energy development.<sup>720</sup>

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<sup>714</sup> Sinadia, H. Interview. 2023.

<sup>715</sup> Sinadia, H. Interview. 2023.

<sup>716</sup> Hamdi, E. Interview. 2021.

<sup>717</sup> Sinadia, H. Interview. 2023.

<sup>718</sup> Republic of Indonesia. (2022, September 13). *Peraturan Presiden Republik Indonesia Nomor 112 Tahun 2022 tentang Percepatan Pengembangan Energi Terbarukan untuk Penyediaan Tenaga Listrik*. Retrieved from <https://drive.esdm.go.id/wl/?id=o8WDm5f2AXpP9Awt2y4CFnvB3t2JdOaf>

<sup>719</sup> EBTKE Official. Interview. 2023.

<sup>720</sup> Nugroho, H. S. Interview. 2023.

In practice, however, the private sector contended that Presidential Regulation no. 112 of 2022 did not significantly differ from the previous regulations because there was no provision on fixed tariffs.<sup>721</sup> Given that independent power producers were selling their electricity outputs to state-owned PLN, fixed tariff held great importance to private companies because it gave clarity over their profit-loss outlook, and eliminated rooms for tariff negotiation with state-owned PLN, which could present risks for private developers.<sup>722</sup>

It was not that the State was unaware of the private sector's preferences for fixed tariffs. To spur renewable energy growth, the Ministry of Energy and Mineral Resources had previously implemented fixed tariffs across different regions and obligated the PLN to buy the outputs; however, the PLN subsequently resisted such obligation, and the Ministry of Energy and Mineral Resources had amended the regulation since then.<sup>723</sup> This demonstrates the State's dominance in the sector and the prioritisation of its interests over those of the private sector. Considering the emphasis on fixed tariffs, the private sector viewed the Presidential Regulation no. 112 year 2022's intentions to retire coal power plants early and ban coal use as insufficient as it did not provide tangible measures to ensure their business viability.

This dynamic reflects a lack of synergy in the *State relation with the private sector*. This observation is corroborated by the private sector's lack of confidence in the State's commitment to renewable energy development, expressed in complaints about excessive hurdles and requirements that rendered projects non-bankable. Moreover, the business development planning (Rencana Usaha Penyediaan Tenaga Listrik/ RUPTL) rolled out by state-owned PLN was perceived as unreliable due to frequent changes and much uncertainty in the implementation process.

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<sup>721</sup> P.T. UPC Renewable Energy Indonesia senior management. Interview. 2023.

<sup>722</sup> Interview with a senior management of P.T. Sumberdaya Sewatama in Jakarta, 27 January 2023.

<sup>723</sup> EBTKE Official. Interview. 2023.

There was also a major complaint around cost issues, which the private sector identified as the primary stumbling block in renewable energy development. State-owned PLN's strong emphasis on price in project bids often overlooked other crucial factors such as company credibility, experience, expertise, and service quality, in tender selection processes.<sup>724</sup> The PLN's auction system, which heavily favoured cost components over quality and experience, awarded projects to the cheapest bidders and made it difficult for reputable companies to secure projects. Furthermore, considering factors such as the TKDN requirement, the tariffs expected from the private sector were deemed impossibly low, often leading to bids that were financially unfeasible, forcing companies into compromises on quality or necessitating renegotiations with the PLN, thereby delaying the commercial operation date (COD). Thus, while private companies did not face major challenges in securing financing from international and multilateral institutions, winning PLN projects remained difficult due to benchmarked prices that were too low and did not align with financial viability for their businesses.<sup>725</sup>

These obstacles significantly hindered renewable energy development in the country. By the time of this dissertation writing, P.T. Vena Energy Indonesia had the largest share of solar and wind power in Indonesia, totaling 114MW combined.<sup>726</sup> However, this figure paled in comparison to the 1500MW the company committed to in the Philippines in 2022. Despite its aspirations to expand its renewable energy portfolio in Indonesia, the company had acknowledged the daunting challenges that pervade the sector.

*The lack of synergy between the State and the private sector* was again demonstrated in the observed mismatch between the private sector's interests and the various assistance schemes that the State provided to support companies develop renewable energy in the country. These schemes

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<sup>724</sup> P.T. UPC Renewable Indonesia senior management. Interview. 2023.

<sup>725</sup> P.T. Vena Energy Indonesia and P.T. UPC Renewable Indonesia senior managements. Interviews. 2023.

<sup>726</sup> P.T. Vena Energy Indonesia senior management. Interview. 2023.

included the Indonesian Infrastructure Guarantee (Penjaminan Infrastruktur Indonesia/PII), which, in coordination with the Ministry of Finance, assessed project viability and financed special projects with lower interest rates; the Viability Gap Fund, which helped companies to meet their financing needs; and the Environment Financing Agency (Badan Layanan Umum Badan Pengelola Dana Lingkungan Hidup/ BLU BPD LH), which managed carbon credit funds for renewable energy projects.<sup>727</sup> Although these assistance schemes were made available, Mr Nugroho acknowledged that the extent of uptake by the private sector depended on its assessment of their alignment with their for-profit interests. At the time of this dissertation writing, the private sector still perceived the costs of developing renewable energy sources in Indonesia prohibitively expensive and not financially attractive.

*The lack of synergy between the State and the private sector* reflects a challenging dilemma for Indonesia. Moreover, to push ahead with low-carbon energy transition, the country must undergo deep systemic transformation, requiring approximately USD600 billion in the energy sector alone,<sup>728</sup> a sum that exceeded the country's financial capacity. While Indonesia had secured financing pledges of around USD20 billion from international sources such as the Just Energy Transition Partnership (JETP) and the Japan International Cooperation Agency (JICA), among others, Indonesia still had to work on the details of the agreements to ensure conformance with Indonesia's regulations.<sup>729</sup> For example, there must not be a direct appointment to certain developers as a condition attached to the assistance, given that the regulations in Indonesia mandated a project auction. Similarly, there must not be a condition attached for certain technology and materials to be used, given that Indonesia had the TKDN requirement. The need to iron out the regulatory details meant a delay in the disbursement of these external funds, and a delay in low-carbon energy transition.

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<sup>727</sup> Nugroho, H. S. Interview. 2023.

<sup>728</sup> PLN senior official. Interview. 2023.

<sup>729</sup> PLN senior official. Interview. 2023.

At this juncture, it is evident that Indonesia was neither able nor completely willing to phase out coal despite efforts to reduce its usage.<sup>730</sup> This rendered low-carbon energy transition progress largely uncertain despite policy measures aimed at expanding renewable energy development. This observation was corroborated by an assessment from the private sector, which doubted Indonesia's ability to meet industrial demands for 100 percent renewable energy-sourced electricity, as pledged by major enterprises that were part of RE100 companies. With renewable energy currently constituting only about 9 percent of electricity in the grid, Indonesia's investment competitiveness could be at risk as RE100 companies might opt to relocate their operations to countries that guaranteed 100 percent renewable energy supply.<sup>731</sup>

The elusiveness of Indonesia's low-carbon energy transition was further reflected in the wait-and-see approach that the State took on renewable energy technology costs, which were anticipated to decrease as demand for renewable energy-generated electricity grows.<sup>732</sup> Betting on time, the country was banking on advancements in battery storage technology, which, despite its current high costs, was expected to become more affordable in the coming years,<sup>733</sup> and could revolutionise renewable energy technologies.

The State's wait-and-see approach was also observed in Indonesia's strategy in response to the global coal market. Given the country's competitive advantage on coal reserves and production, Indonesia framed low-carbon energy transition as a collective effort involving both coal-producing countries like itself as well as coal-consuming countries. Within the framing of shared responsibilities, Indonesia refrained from immediately phasing out coal use and exports, and chose to monitor global coal demand trends and the progress of energy transition initiatives as the basis for its response as a coal producer and exporter.<sup>734</sup> In the interim, the country utilised

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<sup>730</sup> EBTKE official. Interview. 2023.

<sup>731</sup> P.T. Vena Energy Indonesia senior management. Interview. 2023.

<sup>732</sup> PLN senior official. Interview. 2023.

<sup>733</sup> Senior official in the energy sector. Interview. 2023.

<sup>734</sup> Yudha, S. W. Interview. 2023.

emission-reducing technologies such as the super critical and ultra super critical technologies for coal power plants with generating capacity beyond 600MW<sup>735</sup> while waiting for renewable energy to become more economically and technologically viable.<sup>736</sup> This approach clearly manifested a path dependence on coal use, bolstered by the rationale that there was no imperative to completely phase out coal as long as Indonesia's emissions calculations and related plans comply with the COP21's 1.5 degree target.<sup>737</sup>

Regardless of the elusive progress in low-carbon energy transition, Indonesia held promise for renewable energy expansion, and some companies decided to maintain operating their businesses in Indonesia, optimistic that situations would improve over time.<sup>738</sup>

#### 4.8. Summary

This chapter explores the historical evolution of Indonesia's energy sector from the post-1945 independence era to the contemporary period. Applying historical institutionalism, it examines how critical juncture, path dependency, and incremental changes have shaped *State involvement in the energy sector* and *State relation with the private companies* in the specific industry in the sector, and the influence on the transformation of energy policies leading to renewable energy development.

The founding of Indonesia's energy sector traced back to the colonial era. It was characterised by partial *State involvement* (represented by the Dutch colonial rulers) *in the energy sector* and a *complementary relation between the State and the private companies* in the sector. State was

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<sup>735</sup> See: MEMR. (2016, November 14). *PLTU Kapasitas Lebih Dari 600 MW Harus Gunakan Super Critical Technology*. Retrieved from <https://www.esdm.go.id/id/media-center/arsip-berita/pltu-kapasitas-lebih-dari-600-mw-harus-gunakan-super-critical-technology> ; MEMR. (2020, February 26). *Pemerintah Komitmen Kembangkan Clean Coal Technology*. Retrieved from <https://www.esdm.go.id/id/berita-unit/direktorat-jenderal-ketenagalistrikan/pemerintah-komitmen-kembangkan-clean-coal-technology>

<sup>736</sup> Yusgiantoro, P. Interview. 2023.

<sup>737</sup> Yudha, S. W. Interview. 2023.

<sup>738</sup> P.T. Vena Energy Indonesia senior management. Interview. 2023.

more involved in hydropower generation and coal production whereas the private in non-hydropower generation and oil production. Despite such complementary relation, the strategic importance of Indonesia's energy sector to the Dutch economy led the Dutch colonial government to adopt an interventionist approach. This was evident in the Dutch colonial government restricting private sector involvement in hydropower generation and attempting to limit oil industry participation to Dutch companies only. During this early period, both hydropower and non-hydropower generating capacity were developed, reflecting the need to meet increasing energy demand.

The one critical juncture that happened in the country's energy sector was during the time of President Soekarno following the country's independence in 1945. The end of Dutch colonisation presented an opportunity to the newly formed government to introduce radical measures. Fueled by strong nationalist sentiment nationwide, as exemplified in labour union-turned-paramilitary groups seizing electricity and gas installations around the time of Indonesia's declaration of independence in 1945, the State under Soekarno's leadership capitalised on this momentum to nationalise the Dutch electricity enterprises and transferred the workings of the energy sector to the State by establishing state-owned energy enterprises. The nationalisation process that took about fifteen years to complete deepened State involvement in the sector and consequently subjected the energy sector to the State's strategic interests and priorities. During Soekarno's presidency, both hydropower and non-hydropower generating capacity were developed, continuing the legacy of the Dutch colonial ruler. Despite a rise in oil production, the overall performance of the energy sector, and the economy in general, was lackluster given Soekarno's emphasis on territorial and defence-related matters.

Since the independence critical juncture, Indonesia's energy sector had experienced path dependence and incremental changes governed primarily by the State's interests and priorities. Throughout the four periods of analysis, it was evident that the State played a critical role in

setting the agenda and galvanising actions, or constraining them, in the development of various energy sources. In view of the State deep involvement in the sector, the private sector positioned itself in a complementary position and at the service of the State's objectives.

The State's preference for fossil fuel use had been established as far back to Soeharto era, during which time oil production and export was utilised to fund the country's development. Given the country's fossil fuel endowments, the State's agenda for energy diversification, which included renewable energy development, had primarily been seen from energy security lens, particularly in anticipation of depleting oil reserves. In view of global climate processes, the State did not show objections to the call for low-carbon energy transition agenda. However, it is evident that such agenda was not a priority despite the relatively successful mainstreaming of the global climate norms in national policies that subsequently exposed the energy sector to climate mitigation agenda during SBY's presidency. The State's lack of determination in pursuing renewable energy development was attributed to the path dependence over fossil fuel use and its contribution to the country's economy and energy sector, which rendered renewable energy expansion less attractive. This was most evident in the two-pronged approach of simultaneous fossil fuel and renewable energy development that guided the energy sector in the SBY era. The same two-pronged approach was also observed during Jokowi's presidency regardless of increasingly stronger policy measures to expand renewable energy sources and reduce coal use, especially following the 2015 Paris Agreement.

While the country was gradually expanding its utilisation of renewable energy sources, a path dependence on *State deep involvement in the energy sector* suggests that the country had the potential to drive all relevant stakeholders to develop renewable energy sources and phase out fossil fuels, provided the State was strongly committed to it. In other words, Indonesia's low-carbon energy transition will only progress in a meaningful way when the State's perception and

calculations of the benefits of renewable energy sources vis-à-vis fossil fuels begin to shift more favourably towards renewable energy sources.

## Chapter 5

### Pathways of Energy Sector Developments: A Comparative Assessment

#### 5.1. Introduction

This chapter presents a critical comparative analysis of the interactions between *State involvement in the energy sector* and *State relation with the private sector* in the specific industry in the energy sector and policy responses at four periods of analysis, namely the post-independence era, the authoritarian era, the post-authoritarian era, and the renewable energy development era, throughout the history of the two countries. It aims at examining the evolution of the identified variables and the effects on the choice and use of energy sources leading to the development of renewable energy sources and the eventual phase-out of fossil fuels. Historical institutionalism principles suggest that a country's contemporary progress in low-carbon energy transition is a product of historical developments in the energy sector. Carrying out the analysis can thus explain why developing countries still implement the low-carbon energy transition agenda despite financial and technological hurdles, and why some of them do it faster than others.

#### 5.2. Energy Sector Formative Years

The beginnings of the energy sector in both the Philippines and Indonesia can be traced back to the late 19<sup>th</sup> century during the colonial era. The energy sector in both countries developed along similar lines, characterised by the involvement of both the State and the private sector, each within specified functions. In both countries, the State was primarily engaged in coal exploration and hydropower development, while the private sector mostly focused on oil exploration and non-

hydropower development. Additionally, the State assumed oversight and regulatory roles through mechanisms such as the issuance of permits. The private sector generally enjoyed considerable autonomy in making business decisions, including in determining which energy sources to invest in and develop. The simultaneous development of hydropower and non-hydropower sources indicated that ensuring energy supply to meet demand was the primary driver.

Despite these similarities, differences in resource endowments were evident as early as this colonial period. The Philippines had to resort in oil and coal imports due to insufficient domestic production, whereas Indonesia established itself as a major oil and coal exporter. The substantial economic value of Indonesia's mining resources gave them strategic importance, driving the Dutch colonial government to have tighter control over the energy sector despite the private sector's playing a significant role. Such control was observed in several interventions by the Dutch colonial government in oil and hydropower developments. The State's presence in the energy sector was therefore more pronounced in Indonesia than the Philippines.

### 5.3. Post-Independence Energy Sector

The Philippines and Indonesia gained independence from their colonial rulers around the same time in the mid-1940s, following the end of the World War II. Although this politically significant event had the potential to serve as a critical juncture, it generated different effects in each country's energy sector.

In the Philippines, the need to rebuild its devastated post-war economy compelled President Manuel Roxas to support the passage of the parity rights provision in the 1946 Bell-Trade Act despite the country's restrictive laws. This was to allow American continued involvement in the economy, including in the energy sector, which was necessary to secure American investment and technologies as well as the assistance needed to rebuild the country post-independence. President

Roxas successfully navigated the passage of the Act through public campaigns, the exclusion of Communist opposition from Parliament, and intense lobbying with Senate members. As a result, the energy sector in the Philippines maintained its colonial-era configuration, with American companies, particularly in the oil sector, continuing their operations. Consequently, the country's independence marked a near-miss critical juncture given that the energy sector's structure remained largely unchanged since the colonial era.

Conversely, in Indonesia, the end of colonial rule ended all Dutch involvement in the country's economy. Although Indonesia, like the Philippines, faced the imperative to rebuild its economy post-independence, President Soekarno focused on affirming Indonesia's identity as a free and independent nation. Soekarno's anti-imperialist outlook enjoyed popular support because nationalistic fervour was widespread among the post-independence population. Amid heightened anti-colonialism sentiment, the Soekarno administration pursued policies to assert national sovereignty over natural resources. This led to the nationalisation of Dutch enterprises, the transfer of public goods provision to the hands of the State, and the passage of the 1960 Oil and Mining Law no. 44 that prohibited foreign involvement in the oil and mining sectors. This marked a clear departure from the colonial era and thus served as a critical juncture in the energy sector, initiating *State deep involvement*, evidenced by the establishment of state-owned energy companies PERTAMINA and PLN.

The divergent pathways taken by the Philippines and Indonesia after independence led to distinct dynamics in their energy sectors. In the Philippines, the financial and technological prowess of American oil companies, essential for developing the country's oil sector, arguably accorded them certain power in their relations with the State. Additionally, private companies continued to play an important role in the energy sector, while the State maintained its dominance in hydropower generation.

In Indonesia, the country's independence established a regulated, top-down mechanism for energy sector development. With such mechanism, the development of energy sector in Indonesia was governed more closely by the country's strategic interests and priorities, and the mandates of SOEs. Like the Philippines, Indonesia also needed American capital and technology to develop its oil sector. However, unlike the Philippines, the power dynamics between the State and American oil companies was more balanced as evidenced by Indonesia asserting its restrictive policies, compelling negotiations with the American oil enterprises, and resulting in collaborations between SOEs and the American oil firms to operate in Indonesia.

#### 5.4. Energy Sector during Authoritarian Regime

The dynamics in the Philippines' energy sector changed dramatically during President Marcos' Martial Law period. Within the context of rising authoritarianism, and triggered by the 1973 global oil crisis, Marcos nationalised the energy sector as part of strategic measures to address the country's vulnerability against the soaring oil prices. Marcos' nationalisation initiatives marked a critical juncture as the government took over private sector operations, with the exception of foreign oil companies, and transferred energy provision to state-owned energy companies like the NPC and the PNOOC. The nationalisation measures that President Marcos imposed on domestic energy companies represented a clear departure from the previously amicable public-private relationships observed in earlier administrations.

Like in Indonesia, the development of the energy sector in the Philippines became top-down, with investment choices heavily influenced by the State's strategic directives and policies, even when they lacked market rationale. For example, Marcos issued policies to boost domestic coal production despite its poor quality and low economic value. Other developments such as the ramping up of geothermal and hydropower and the construction of nuclear power plants was also part of the State's strategic agenda to meet energy needs and reduce its dependence on imported

fossil fuels. The nuclear power plant project would have materialised had it not been for the corruption allegations that eventually halted it. Similarly, the favourable treatment of foreign oil companies reflected Marcos' strategic and pragmatic approach, given the country's high dependence on foreign capitals and technology in the oil sector.

In Indonesia, the transition of political leadership from President Soekarno to President Soeharto further deepened State involvement in the energy sector. Such deepening was enabled not only by Soeharto's authoritarian leadership style, but also by his strategic formulation of the natural resource utilisation as a key enabler of the country's economic development, following the feedback by his economic advisers. To facilitate this, Soekarno-time policy was reversed to allow foreign investments in the sector, through the enactment of Law no. 11 year 1967. Under Soeharto, the State directed energy sector development, emphasising increased oil exploration and export, as well as energy diversification. This was evidenced by the revival of the sunset coal industry and the construction of the first geothermal facilities, achieved through various policy interventions.

Following high oil withdrawal rate, the strategic vision for energy diversification was then also conceived to anticipate future oil depletion. Given its status as an oil producer, Indonesia was not affected by the 1973 global oil crisis in the same way as oil-importing countries such as the Philippines. Rather, Indonesia responded to the crisis by maintaining its oil exports and reinforced the country's energy diversification plans.

State involvement in the energy sector was solidified with the establishment of BAKOREN, a coordinating agency responsible for formulating national energy policies. The agency further shaped the direction of the country's energy sector development. The State's authority was also evident in its response to the 1992 Rio Earth Summit and the subsequent ratification of the 1992 UNFCCC, as it did not translate the global climate change agenda into climate mitigation measures in the energy sector due to its strategic interest in safeguarding the development in the energy sector for energy security and national economy purposes.

At this juncture, it is apparent therefore that State deep involvement influenced the energy sector's development according to its strategic interests and priorities. The *relationship between the State and the private sector* also tended to accord more power to the State although, unlike in the Philippines, Indonesia did not appropriate and nationalise private companies during Soeharto's authoritarian regime.

## 5.5. Energy Sector in the Post-Authoritarian Period

After a period of deep *State involvement in the energy sector* in both countries, their energy pathways diverged again with the fall of Marcos following the politically significant People's Power Movement in the Philippines in 1986. His downfall made way for his political opponents, who were eager to purge the country of Marcos' corrupt legacy, to assume top leadership positions. His successor, President Corazon Aquino, reversed Marcos-era policies by re-privatising the energy sector and mothballing the corruption-ridden Bataan nuclear power plant (BNPP). These initiatives carried a strong political undertone.

While she was largely successful in achieving her political objectives, the electricity industry was not performing well in general, resulting in frequent brownouts that frustrated both the people and the economy. The State through state-owned NPC still had a considerable role in electricity provision at that time. The State's perceived inefficiency in providing electricity, combined with its lack of financial resources to build infrastructure necessary for economic growth, led to poor performing economy and growing public discontent. Consequently, the Aquino administration was compelled to strengthen private sector involvement in the energy sector and in the economy at large. The IMF, engaged by both the Aquino and Ramos administrations for financial assistance, exerted significant influence by pressuring leaders to adhere to market liberalisation as a condition for the various assistance it was disbursing to the Philippines.

The 1997 Asian financial crisis decisively accelerated the process. The crisis uncovered the financial conundrum within state-owned NPC, further negatively affecting the State's reputation in managing the energy sector and bolstering public sentiment that the private sector was more capable to run electricity businesses. Support for privatisation gained stronger momentum, culminating in the passage of the EPIRA in 2001, which privatised the electricity sector just a few months after President Estrada was ousted and replaced by Gloria Macapagal-Arroyo.

The end of Marcos' authoritarian regime in the Philippines thus marked a critical juncture that significantly reduced State involvement in the sector. This transition thus liberated the private sector from the State's strategic interests and priorities, granting it greater autonomy to make business decisions based on market forces. At the same time, the privatisation of electricity provision shifted the power dynamics between the State and the private sector, making the State dependent on the private sector for electricity supply in the country. Consequently, when State's strategic direction did not align with market forces, the State had to attract the private sector by addressing their for-profit interests and offering support and incentives to guide the private sector toward that strategic goal.

Like in the Philippines, the 1997 Asian financial crisis had significant repercussions in Indonesia, which included ending Soeharto's 32-year authoritarian presidential reign. The financial crisis, and the subsequent Law no. 20 year 2002 on Electricity, which attempted to privatise the electricity sector as a condition for receiving aid from international institutions to deal with the financial crisis, could have acted as a critical juncture in the energy sector. However, unlike in the Philippines where political leaders (Presidents Aquino and Ramos) themselves saw privatisation as a solution to their domestic issues post-Marcos, Indonesia's attempt at privatisation in the electricity sector was primarily a response to the 1997 Asian financial crisis. Furthermore, while the private sector in the Philippines had traditionally played a prominent role since the colonial era until the Marcos' authoritarian period, Indonesia's electricity sector had always been under

the strong influence of the State since post-independence Soekarno. Given such context, Indonesia's privatisation journey inevitably faced greater controversy compared to the Philippines. This was evident in the strong opposition from members of the public, and the eventual repeal of the Electricity Law by the Indonesian Constitutional Court in 2004.<sup>739</sup>

The Electricity Law was signed and endorsed by President Soekarnoputri. Its repeal, therefore, signified the institutional constraint on political leadership's decision-making despite the power of top political leaders to introduce changes as seen during Soekarno's and Soeharto's presidencies. It demonstrated that institutional constraint was particularly effective when proposed changes deviated significantly from existing path dependence on the State's role in the sector. The repeal of the Electricity Law thus allowed the State deep involvement in the sector to continue, maintaining the strategic interests and priorities of the State and state-owned energy enterprises to influence the sector's development.

The end of the authoritarian regimes in both countries thus had distinct impacts on their energy sectors. In the Philippines, it led to the privatisation, whereas in Indonesia, it witnessed the State's continued deep involvement in the sector. These contrasting scenarios set the stage for both countries' transitions into the renewable energy development era.

## 5.6. Renewable Energy Development Era

In the Philippines, the idea of expanding renewable energy sources beyond geothermal and hydropower can be traced back to Ramos' presidency, during which time the development of indigenous renewable energy sources including solar and wind power to strengthen the country's energy security started to gain greater prominence. This focus continued under President Gloria

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<sup>739</sup> Constitutional Court of the Republic of Indonesia. *Anotasi Undang-Undang Berdasarkan Putusan Mahkamah Konstitusi: Undang-Undang Republik Indonesia Nomor 20 Tahun 2002 tentang Ketenagalistrikan.*

Macapagal-Arroyo, who saw renewable energy sources not only as a means to enhance energy security but also as a tool for poverty reduction and economic recovery following the 1997 Asian financial crisis, particularly through job creation.

However, despite global trends of declining renewable energy costs and increasing investments, the high cost of renewable energy development, coupled with the country's recovering economy post-1997 Asian financial crisis and its longstanding high electricity prices, made it less attractive for the private sector to invest in renewable energy. In response to these challenges and in the context of the 2001 EPIRA, the State was compelled to create incentives to guide the private sector towards renewable energy. This necessity, alongside a decade of draft bill deliberations and active advocacy by civil society groups on the grounds of environmental concerns, led to the passage of the Renewable Energy Act in 2008.

The 2008 Renewable Energy Act marked a critical juncture in the Philippine energy sector. It not only galvanised the private sector but also underscored the State's determination to harnessing and maximising the country's indigenous renewable energy sources. In the decade following its enactment, the progress in developing renewable energy sources had been notably encouraging.

In Indonesia, the State's continuing deep involvement also allowed a greater expansion of renewable energy sources. The energy diversification agenda, initiated during Soeharto's presidency for energy security reasons, gained additional impetus with the integration of climate change agenda into energy policies under President SBY. Driven by his personal disposition and responsiveness to international agendas, and facilitated by State deep involvement in the energy sector, SBY brought Indonesia much closer to global climate objectives than his predecessors. While previous administrations had translated international agreements such the 1992 UNFCCC and the 1997 Kyoto Protocol into national policies, often by selectively emphasising certain aspects that were in line with the country's economic interests, SBY adopted global climate objectives by gradually subjecting various sectors, including energy, to climate mitigation

measures. In other words, the vision for renewable energy development in SBY era was more deliberate and targeted, informed by environmental concerns as well as the country's increasingly pressing need to replace depleting oil reserves.

This approach created an imperative for a low-carbon transition in the energy sector. The incremental steps taken led to a two-pronged approach that pursued the simultaneous development of both fossil fuels and renewable energy sources. The two-pronged approach enabled Indonesia to safeguard its energy security while accommodating the interests of various stakeholders, thereby introducing the climate mitigation agenda in the energy sector with minimal resistance. However, continuing the development of fossil fuels, particularly coal and natural gas, ultimately compromised to the underlying climate mitigation goals of the low-carbon energy transition agenda.

The two-pronged approach thus presented a middle ground, indicating that the trajectory to a low-carbon energy transition will be marked by compromises and shaped by the State's strategic interests and priorities. This approach also implies that the private sector, as independent power producers, was highly dependent on State's directives and policies in making their business investments. Unlike the Philippines where the State relied on the private sector for electricity provision and therefore must attend to their interests, Indonesia's deep *State involvement* granted it greater control over the terms and direction in the energy sector. In essence, a low-carbon energy transition will only advance if the State is fully determined to do so.

## 5.7. Low-Carbon Energy Transition Outlook

Indonesia's determination to advance renewable energy was elusive given its unique economic context, where the benefits of such energy sources were not appraised in the same way as in the Philippines. With its vast natural resource reserves, Indonesia's competitive advantage lied in

mining, including coal. The argument that renewable energy projects were good for the economy because they created jobs did not constitute a strong enough of incentive for Indonesia to push the renewable energy agenda forward. However, the intensifying focus on climate issues at the global level had indeed made it increasingly difficult for Indonesia to maintain the status quo.

Indonesia's commitment to global climate initiatives, along with a growing personal awareness of climate concerns, compelled Parliament Commission VII's members to begin drafting a dedicated renewable law in 2019, twelve years after the development of renewable energy sources was envisioned in the 2007 Energy Law during SBY era. Subsequent related developments included Jokowi pledging for carbon-neutrality by 2060 and the passage of Presidential Regulation no 112 of 2022 to accelerate renewable energy development.

Despite such progress, Indonesia remained occupied with creating additional economic justifications for expanding renewable energy sources. This included mandating the TKDN requirement and developing an industrial base for renewable energy technology, as seen in the development of nickel-mining industry to support global electric vehicle production.<sup>740</sup> A clear manifestation of competing agendas and compromises surrounding low-carbon energy transition in Indonesia was in the delay in passing the renewable energy bill, which remained a draft bill five years later, during the time of this dissertation writing.

On the other hand, in the Philippines, the potential bottleneck lied with the private sector, who was more autonomous in their business decision-making. This means that even if the State is committed to a low-carbon energy transition, the progress will largely be influenced by the private sector's reception of the incentives offered by the State. This is especially the case when if the low-carbon energy transition agenda does not yet align naturally with market forces.

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<sup>740</sup> Nangoy, F., Suroyo G., and Christina, B. (2023, February 6). *Like Musk, Nickel-Rich Indonesia Has High Electric Vehicle Ambitions*. Reuters. Retrieved from <https://www.reuters.com/markets/commodities/like-musk-nickel-rich-indonesia-has-high-electric-vehicle-ambitions-2023-02-06/>

Against such a backdrop, it is not surprising that the Philippines has made faster progress than Indonesia in expanding its renewable energy sources. This observation is corroborated by various statistical data relating to renewable energy development in both countries over the last 10-15 years, as shown in Appendix B. With major private power producers in the Philippines beginning to reduce coal use and increase the share of renewable energy in their electricity generation in recent years, it can be said that the Philippines has now entered the low-carbon transition phase.

Furthermore, the Philippines showed stronger resolve and flexibility to overcome the various challenges related to expanding renewable energy technologies compared to Indonesia. This is demonstrated through the formulation and implementation of preferential policies for renewable energy such as the RPS, the GEOP, and the GEAP, as well as scheduled auctions for renewable energy projects, the creation of EVOSS, and the decision to allow 100 percent foreign ownership of renewable energy projects to address cost and financing challenges. While the Philippines has entered the early phase of the low-carbon energy transition, the extent to which it will progress in alignment with global climate goals remains to be seen. Nonetheless, the prospect of low-carbon transition in the Philippines is more promising than in Indonesia.

In Indonesia, while several mechanisms have been established to support renewable energy development, there is no preferential treatment to deliberately encourage its expansion. Instead, the existing incentives and assistance are part of the broader strategic context focused on economic and energy security, which does not necessarily prioritise renewable energy sources. This situation may evolve with the eventual passage of a dedicated renewable energy law that would include specific provisions for promoting renewable energy. Until such legislation is enacted, the ongoing challenges facing renewable energy development in Indonesia are likely to persist.

Another factor that makes low-carbon energy transition in the Philippines more promising is the possible end of its technology-neutral approach. With the formulation of an energy transition bill

is underway, the passage of this legislation would mandate a fossil fuel phase out. In contrast, Indonesia is expected to continue utilising and exporting coal, especially when global coal demand still exists, while gradually increasing the share of renewable energy sources in its energy mix until such time when renewable energy can match coal in terms of energy performance and economic benefits. With the coal industry still being given the opportunity to maximise its contributions to energy supply and the economy, Indonesia's low-carbon energy transition likely needs to wait until the country's assessment of renewable energy's economic and energy security contributions can improve vis-à-vis coal and natural gas.

Moreover, the private sector in the Philippines is generally content with the overall arrangements and incentives that the State has been providing them. The mutual dependence and synergy between the State and private sector have fostered a trust in the State's commitment to advancing renewable energy expansion. In contrast, the private sector in Indonesia generally expresses frustration over the myriad hurdles encountered in developing renewable energy sources in the country.

## 5.8. Summary

This chapter has carried out a systematic comparative analysis of the interactions between *State involvement in the energy sector* and *State relation with the private sector in the specific industry in the energy sector* and the transformation of energy policies leading to renewable energy development in the four periods of analysis in the Philippines and Indonesia. The comparative analysis in this chapter shows that while both the Philippines and Indonesia acknowledged the benefits of renewable development as a viable solution to their domestic needs, the Philippines assessed renewable energy development more favourably compared to Indonesia. For the Philippines, the expansion of indigenous renewable energy sources was critical to fortify its energy independence, which was central to the country's energy security. For Indonesia,

renewable energy development was desirable to help the country diversify away from oil, but its importance was not yet as critical given that Indonesia still had other domestic energy sources, such as coal, that could enable the country to achieve the same objective. Furthermore, coal production and export had been contributing to national income. Thus, while both countries assessed renewable energy development as a viable solution to their domestic needs and have implemented the low-carbon energy transition agenda, the Philippines was demonstrably more willing to accept cost-related and other risks to explore how renewable energy development could further benefit the countries. The passage of the 2008 Renewable Energy Act demonstrated such commitment as it provided the legal basis for the provision of incentives for the development of renewable energy sources.

The earlier passage of the EPIRA in 2001, which transferred electricity provision in the Philippines from the State to the private sector, arguably created a more conducive environment for renewable energy expansion and low-carbon energy transition. The long legacy of the private sector's involvement in the sector, and the more balanced power dynamics between the State and the private sector, made them less subservient to the State's changing interests and priorities. In fact, in the Philippines, the private sector had more power to affect the pace of renewable energy expansion as it could choose to halt progress if the State failed to offer sufficient incentives. Currently, the State's strong determination to pursue renewable energy development, both for energy security and climate mitigation reasons, converged with the private sector's interests. This mutual alignment between the State and the private sector in the Philippines fostered a greater synergy, making progress towards a low-carbon energy transition more promising. The lack of complaints expressed by interview respondents from the private sector confirmed such synergy.

On the contrary, in Indonesia, the State's more dominant position in the energy sector allowed it to prioritise its interests and priorities over those of the private sector's. This was evident in the multiple additional agendas that the country was pursuing at the same time as expanding

renewable energy sources. These included strategising the most optimum treatment for coal, managing the problems faced by state-owned PLN, and capitalising on global low-carbon energy transition agenda by creating a domestic industrial base for renewable energy technologies. The lack of focus on expanding renewable energy installations had thus slowed down renewable energy development progress. The frustration expressed by interview respondents from the private sector signified a lack of synergy between the State and the private sector in pursuing renewable energy development. As long as the private sector is expected to be on the forefront of renewable energy development in Indonesia, the power dynamics that favoured the State in the energy sector is likely to hinder progress until the State demonstrates a genuine commitment to renewable energy expansion and low-carbon energy transition. This can be facilitated by the end of global coal demand, the drop in costs of key renewable energy technologies such as the battery storage, and the success of the country in building renewable energy industry.

These observations help to formulate a more realistic assessment of the prospects of low-carbon energy transition processes in both countries moving forward. It is apparent that there is more promise in the Philippines, and one could anticipate a more difficult trajectory for low-carbon energy transition moving forward.

## Chapter 6

### Summary and Conclusion

The purpose of this research project has been two-fold: first, to evaluate why developing countries still take up the low-carbon energy transition agenda despite financial and technological hurdles, and second, to analyse why some developing countries implement the agenda faster than others.

This study has attempted to answer the research questions by applying historical institutionalist approach. By analysing critical junctures, path dependency, and incremental changes across different periods, this study argues that the historical development of *State involvement in the energy sector*, and *State relation with the private sector in the specific industry in the energy sector*, affected the evolution of energy policies that eventually led to the mainstreaming of renewable energy development in the energy policy.

The emphasis on the State was made following a review of existing literature that affirms the critical role of policies in effecting energy transition. Additionally, given that most developing countries have limited capacity for technological innovations, the focus on the State and policymaking complements the usual engagement of sociotechnical transition's MLP framework that positions technological innovations as the primary driver of energy transition. Sociotechnical transition's MLP is the most widely used framework to explain energy transition.

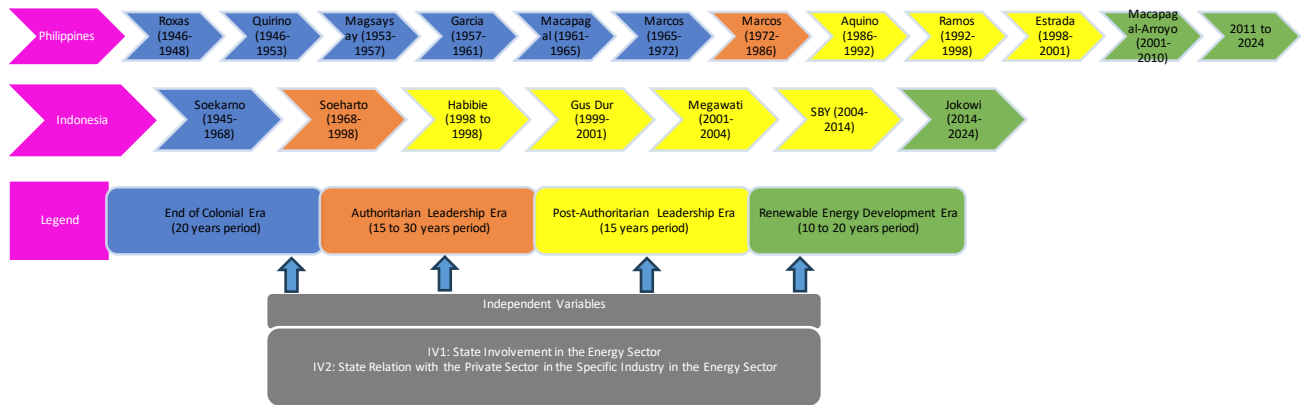
To see the contrast, the study identified the Philippines and Indonesia as case studies. An early statistical observation showed that the Philippines made a far significant progress in wind and solar power development after 2015 despite a similar start in the preceding years in the two countries. While noting the difference in coal endowment with Indonesia having significantly more, similar characteristics such as geographical location, increasing energy demands driven by

huge population size and high economic growth rate, and vulnerability to climate-driven natural disasters are among reasons to choose the two countries for this comparative study.

Against this backdrop, Chapter Three traces back the history of the Philippines' energy sector from its founding during the colonial era and Chapter Four does the same for Indonesia. The purpose is to map the initial landscapes of the energy sector in both countries upon which the process tracing began. The study categorised four similar significant periods that both countries experienced namely the post-independence era, the authoritarian era, the post-authoritarian era, and the renewable energy development era. In each of this period, the analysis of critical juncture, path dependence, and incremental changes on *State involvement* and *State relation with the private sector* in the specific industry in the energy sector, and the implications on energy policy transformation and choice of energy sources, is carried out. The within-case analyses in Chapters Three and Four then discuss how the different pathways are currently affecting renewable energy development and low-carbon energy transition progress in each country. Chapter Five subsequently presents a critical comparative analysis of the factors that led to the formation of the different trajectories in both countries. The historical timeline and the periods of comparative historical analysis are summarised in Figure 6.1.

The configurations of the Philippines' and Indonesia's early energy sector exhibited some similarities and differences. In both countries, the State, represented by the colonial rulers, and the private sector were involved in the energy sector, with the State generally focusing on hydropower development and coal production whereas the private sector focusing more on oil production and thermal power development. Within the private sector, the Philippines saw the active involvements of American companies, whereas Indonesia saw the active involvements of Dutch companies. The relationship between the State and the private sector was thus generally complementary, with the development in the energy sector being meant to meet energy needs, as evidenced in the non-selective pursuit of various energy sources.

**Figure 6. 1: The Four Periods of Comparative Historical Analysis**



*Source: Author*

Despite these similarities, the difference in oil and coal endowments, which saw Indonesia having much more, was also observed since the colonial era. Although the Philippines had domestic coal and oil, it needed to resort in import to meet its needs. Indonesia, on the other hand, emerged as an important exporter. Given their economic values, this rendered the energy sector more strategic for Indonesia compared to the Philippines, and saw the Dutch colonial ruler in Indonesia having more interventions in the sector compared to the Philippines. The interventions, however, mainly meant to limit the involvement of certain actors in the development of certain energy sources. For example, the Dutch colonial rulers attempted to limit the involvement of the American oil companies in the oil industry, and the private sector’s involvement in hydropower development. The landscaping of the initial configurations in both countries serves as a starting point for the process tracing in the four identified periods of analysis.

### **State Involvement in the Energy Sector**

Both the Philippines and Indonesia gained independence from their colonial rulers in the mid-1940s. Despite a similar politically significant development, both countries underwent different

experiences in the energy sector. One important determinant is the State involvement in the energy sector.

### *Indonesia*

In Indonesia, the country's independence marked a critical juncture that resulted in stronger State involvement through the nationalisation of the Dutch companies and the establishment of state-owned energy enterprises like Pertamina and PLN in the oil and electricity industries respectively. The transfer of the workings of the energy sector to the State granted it considerable power. Such changes deeply impacted the energy sector because the sector became more heavily influenced by the interests and priorities of the State and its relevant agencies, as reflected in policies that restricted foreign involvement in the extractive industry. While the restrictive policies were not able to revive the coal industry that had suffered from slumping production after World War II and declining global demand due to increased oil use, Soekarno-era's establishment of the State's central role in the energy sector had set the foundation for the subsequent development in the sector.

State involvement in the energy sector arguably deepened when authoritarian leader Soeharto came to power in 1968. Unlike Soekarno, Soeharto was able to utilise the State's control over the sector to achieve its strategic objectives. Having established the role of natural resources, most notably oil, as the key enabler of the country's economic development, President Soeharto reversed Soekarno era's restrictive policies and opened the extractive industry to foreign investments. The policies formulated during Soeharto's presidency have proven to be a gamechanger that resulted in a massive expansion of oil, coal, and LNG productions and exports. The increase in coal production and export could also have been in response to the growing global demand for coal following the 1973 global oil crisis, which made coal a viable oil substitute.

The increase in non-oil production was likewise enabled by Soeharto's energy diversification policy that aimed at ensuring domestic energy supply in view of oil export. Soeharto-era

diversification policy was considered successful as evidenced by the revival of the dying coal sector, the beginning of coal utilisation in power plants, and the commissioning of the first geothermal facility in 1981.

By the time Soeharto's presidency ended in 1998, the close to 50 years of State deep involvement in the energy sector had arguably turned into a path dependence. The 1997 Asian financial crisis almost led to a critical juncture with the passage of the 2002 Electricity Law. However, the Constitutional Court's revocation of the Law, which contained provisions to privatise the electricity sector, ended up maintaining strong State involvement in the electricity sector.

State continuing deep involvement in the energy sector enabled President SBY to introduce the global environmental agenda into national policies. His personal disposition towards global environmental agenda had an important role in the formulation of numerous climate-related policies and initiatives during his presidency, which eventually resulted in the exposure of the energy sector to climate mitigation imperatives. This was largely unprecedented given that the push for renewable energy expansion in the previous administrations had largely been motivated by energy security consideration, for the purpose of replacing depleting oil reserves. Despite a stronger thrust to address climate change, in practice, SBY-era policies continued to see considerable coal expansion. In other words, the country adopted a two-pronged approach of simultaneous fossil fuel and renewable energy development regardless of the State's relative success in mainstreaming the global climate agenda into national policies.

The Jokowi administration continued the two-pronged approach, thereby rendering low-carbon energy transition in Indonesia elusive.

### *The Philippines*

In the Philippines, its independence did not result in major changes in the energy sector due mainly to the need for American continuing involvement to rebuild the country's devastated post-

war economy, despite the political leaders' intentions to impose restrictive policies. Consequently, the State involvement in the energy sector remained focused on hydropower development and the continuing presence of American oil companies maintained the country's use of oil.

The combination of Marcos-era Martial Law and the 1973 global oil crisis became a critical juncture that transferred the workings of the energy sector to the State. This was a clear departure from the general configuration that had been in place since the colonial era as it significantly affected the private companies' involvement in the sector, except for the foreign oil companies that were still allowed to continue their operations in the country. Similar to what happened in Indonesia right after independence, the transfer to the State significantly increased its power in the sector. Consequently, the Philippines' energy sector became subject to the State's strategic interests and priorities, including the choice of energy sources. This was seen, for example, in the policy to increase in the production and utilisation of domestic coal even though it was of low quality and not of the most economical option to have. Marcos' presidency also saw an increase in geothermal production, which initial works began during President Macapagal era, and the successful construction of the country's first nuclear power plant. Like it was during Soeharto's authoritarian era in Indonesia, the energy diversification policy in Marcos' authoritarian era was considered successful in the Philippines.

The end of the authoritarian regime led to another critical juncture that reversed the workings of the energy sector back to the private sector. The re-privatisation process in the electricity sector that began since the Aquino presidency took about fifteen years to complete and culminated in the passage of the EPIRA in 2001 against the backdrop of the 1997 Asian financial crisis and pressures from international institutions such as the IMF. In between the period, the State began translating the global climate agenda into national policies, paving the way for the energy sector to get exposed to low-carbon transition imperative.

It was within this post-authoritarian period that the era of renewable energy development began in the Philippines. The adoption of the global climate agenda since Aquino presidency gradually converged with the country's assessments of the merits of indigenous renewable energy development for its energy independence and economic growth. Renewable energy expansion was deemed to have promising contributions to the country's economic recovery efforts post-1997 Asian financial crisis. Regardless of its relatively high costs compared to fossil fuels at the time, the Renewable Energy Act was eventually passed in 2008 after decade-long deliberations.

Such development, however, did not automatically translate to a reduction in fossil fuel use given the technology-neutral principle that the country espoused in the energy sector. In other words, despite a convergence between global climate norms and renewable energy development, the main drivers of such development remained energy security and economic growth. The technology-neutral principle thus gave uncertainty to the future progress of low-carbon energy transition regardless of considerable growth in solar and wind power installations in the last decade.

### **State Relation with the Private Sector in the Specific Industry in the Energy Sector**

#### *Indonesia*

The transfer of the energy sector to the State in post-independence Indonesia re-constituted its relation with the private sector. The imposition of restrictive policies that prohibited foreign involvements in the sector signaled a power relation that tilted towards the State. The exercise of State's authority in the sector was clearly demonstrated in the contract re-negotiation with American oil companies, which resulted in a compromised agreement seen in the partnering with Indonesian state-owned companies as a condition for the American companies to resume their operations in Indonesia. The contract resumption led to continued oil production in Indonesia.

The power relation between the State and the private sector that tilted more towards the State continued during Soeharto era. The development of the energy sector was heavily influenced by the State's interests and priorities, and the role of the private sector, which included coal and oil companies, was to work towards meeting the State's objectives. Despite the private sector seemingly having to serve State interests, the private companies could nonetheless thrive. It was evident, therefore, that the State's tight control and directives during this era were broadly effective in achieving the State's strategic vision.

The positioning of the private sector at the service of the State's objectives continued to SBY's and Jokowi's presidencies. This implies that it is the State determination to pursue low-carbon energy transition that critically influences its progress.

### *The Philippines*

The country's reliance on American assistance after independence arguably created a power relation between the State and the private sector that tilted more towards the latter, especially towards American oil companies. This arguably played a key role in maintaining oil production and use in the country. In other words, the interests of those in the oil market had an important role in influencing the dynamics in the energy sector. The relative stronger power of the private companies vis-à-vis the State was still evident even when Filipino oligarch took over Meralco. Regardless of State's intervention in Meralco's affairs, the company was still able to significantly expand its business.

Marcos-era's authoritarian regime served as a critical juncture that completely changed the State relation with the private sector through his nationalisation policy which appropriated private companies. Consequently, the development in the energy sector became subject and controlled by the State's agenda and directives.

The re-privatisation initiatives that began since the Aquino presidency and culminated in the 2001 EPIRA re-shaped the power relation between the State and the private sector in the electricity industry. The State became dependent on the private sector for electricity provision, and this relation compelled the State to provide support to private companies to catalyse renewable energy development. This was especially so when the market forces were not yet in favour of its development due to its higher costs. In this regard, the passage of the 2008 Renewable Energy Act which contained provisions on incentives, played a critical role in spurring its expansion. These provisions had indeed resulted in the development of renewable energy sources in the country in the last decade.

Despite the State's determination to develop all types of indigenous renewable energy sources, the private sector's for-profit interests that strongly influences the energy sector renders the subsequent progress of low-carbon energy transition remains uncertain. This is because different renewable energy sources are valued differently from the business perspective. The development of hydropower and geothermal, for example, is considered high risks and gained little interest from the private sector.

### **Contemporary Low-Carbon Energy Transition**

At this juncture, it is evident that the Philippines' technology-neutral approach that continued until the current Bongbong Marcos' presidency and Indonesia's two-pronged approach that continued until the current Joko Widodo's presidency both allowed for the continuing use and expansion of fossil fuels. The difference, however, lied in the Philippines showing a greater resolve to push for renewable energy development, and in its private sector generally expressing confidence in the State. As a result, the private sector already began to transition to renewable energy sources despite the country's technology-neutral approach. In Indonesia, the State's determination to develop renewable energy was weaker, and the private sector was generally

dissatisfied with the government's measures. As a result, renewable energy expansion either got constrained or delayed.

It is apparent, therefore, that the progress of low-carbon energy transition in the Philippines is more promising than Indonesia. In the Philippines, the path to low-carbon energy transition is likely to continue as long as the synergy between the State and the private sector is maintained. One factor that may affect such progress is the private sector's disinterests in developing certain energy sources, such as geothermal and hydropower, that they deemed unattractive for their business interests. However, this evaluation may change following factors such as future technological advancements, changes in market demand, among others. In Indonesia, the path to low-carbon energy transition is contingent on the State's evolving evaluation of renewable energy sources vis-à-vis fossil fuels in terms of their contribution to energy security and economic growth. Tables 6.1 and 6.2 summarise the historical evolution in the energy sector that influenced contemporary low-carbon energy transition in the Philippines and Indonesia.

**Table 6. 1: Summary of the Historical Evolution of the Philippines' Energy Sector**

	Founding Era (late 19 <sup>th</sup> century to mid- 1940s)	Post-Independence Era (1946 to 1972)	Authoritarian Era (1972 to 1986)	Post- Authoritarian Era (1986 to 2001)	Renewable Energy Development Era (2001 to 2024)	Low-Carbon Energy Transition Evaluation
<b>The Philippines</b>	Free development of various energy sources (hydropower and non-hydropower)	Continuing American involvement and dominance in oil industry	Nationalisation of private companies, except foreign oil companies	Re-privatisation of the energy sector, culminating in the passage of 2001 EPIRA for electricity provision	Convergence of climate agenda, and energy security and economic growth interests in support of renewable energy development	Low-carbon energy transition has started; private sector beginning to reduce fossil fuel use
	State involvement in coal industry and hydropower development	Gradual transfer of the running of electricity industry from American to Filipino oligarch	Establishment of SOEs such as PNOC, and Department of Energy	Mothballing of nuclear power plant	Passage of the 2008 Renewable Energy Act	Promising trajectory moving forward as long as private sector's interests are met
	Private sector in oil industry and thermal power development	Free development of various energy sources (hydropower and non-hydropower, including geothermal)	State heavily directed development and use of certain energy sources, driven by energy security agenda	State's pro-active responses to global environmental processes; Gradual exposure of energy sector to climate mitigation agenda	State needing to support/ incentivise private sector for renewable energy development; Reasonable synergy between them at the start of this era.	
			Push for domestic coal production despite low quality; construction of nuclear power plant	Market forces guiding energy sector; State being captive to private sector's interests	Renewable energy development taking place within technology-neutral approach	

Source: Author

**Table 6. 2: Summary of the Historical Evolution of Indonesia’s Energy Sector**

	Founding Era (late 19 <sup>th</sup> century to mid- 1940s)	Post-Independence Era (1945 to 1968)	Authoritarian Era (1968 to 1998)	Post- Authoritarian Era (1998 to 2014)	Renewable Energy Development Era (2014 to 2024)	Low-Carbon Energy Transition Evaluation
<b>Indonesia</b>	Free development of various energy sources (hydropower and non-hydropower)	Nationalisation of Dutch companies	State heavily directed development and use of certain energy sources, driven by economic growth agenda	Failed attempt at privatising the electricity industry; Continuing State deep involvement in the sector	Mainstreaming of global environmental agendas in national policies	Low-carbon energy transition has not started; challenging trajectory for renewable energy development, let alone fossil fuel phase-out
	Major oil and coal exporter	Establishment of SOEs such as Pertamina (oil company) and PLN (electricity company)	State creating domestic market for coal	Continuing captive by State’s strategic interests and priorities	Energy sector gradually getting more exposed to climate mitigation imperative	Elusive trajectory moving forward, depending on State’s evolving evaluation of renewable energy vis-à-vis fossil fuels contribution to energy security and economic growth agendas
	State (Dutch colonial ruler) limiting private sector’s involvement in hydropower development	Continuing operations of American oil companies, but accompanied by assigned SOEs	Massive oil production; revival of coal production; start of geothermal production		Two-pronged approach, influenced by State’s strategic interests and priorities	
		Development of energy sector held captive by State’s strategic interests and priorities	Major oil, coal, and natural gas exporter		Reluctant development of renewable energy sources; continuing fossil fuel dominance	
		Increased oil production; decreased coal production post-World War II				

Source: Author

The historical institutionalism approach applied in this study thus demonstrates that the ongoing low-carbon energy transition process in the Philippines and Indonesia is influenced by the critical junctures, path dependency, and incremental changes within the energy sector. Based on the empirical findings reflected in Chapters Three and Four, and the comparative historical analysis in Chapter Five, this study offers the following conclusions:

**1. The State's determination to pursue renewable energy option is key to its development**

The centrality of the State as the primary actor in enabling renewable energy development is evident in both the Philippines and Indonesia. Both countries have witnessed the evolution of State's involvement in the energy sector throughout history, with Indonesia having a longer legacy of State deep involvement in the sector compared to the Philippines. At first glance, such difference in structure may appear to contribute to Indonesia's relative slow progress. However, contrasting with Indonesia's rapid development of various energy sources under Soeharto's presidency when the structure then was somewhat similar to now, it is argued that Indonesia's current slow progress in developing renewable energy sources is not attributed to the structure but to the country's lack of determination. The lack of determination is closely tied to the country's appraisal of the values of renewable energy sources vis-à-vis fossil fuels in contributing to the country's energy security and economic development. Fossil fuels have a long legacy in contributing to such purposes, tracing back to the colonial era, which was further entrenched during Soeharto's rule. Since then, fossil fuels including domestic coal have been regarded as a reliable energy source and an important income generator that turned Indonesia into a major coal producer and exporter in the world. By contrast, renewable energy sources have yet to catch up the same way despite their declining costs and their promising potential in contributing to the country's energy security, economy, and sustainability vision. Furthermore, externalities aside, coal remains the most cost competitive option in the country at the time of this dissertation

writing. Against such a backdrop, Indonesia's determination to pursue renewable energy development was therefore weak, rendering low-carbon energy transition elusive despite the multiple measures put in place to push for their development.

In the Philippines, the State is strongly determined to pursue renewable energy development given its role in enhancing the country's energy security by reducing the country's fossil fuel import dependence through the development of indigenous renewable energy sources. Fossil fuels have long played an important in the Philippine electricity generation, and coal has long been considered as the cheapest option. However, coal being an import commodity has increasingly made the country feel insecure, especially in light of the recent war in Ukraine which had driven up global coal prices. Against the backdrop of declining renewable energy costs, coal is slowly losing its cost competitiveness, and renewable energy sources are gaining stronger justification.

Energy security imperative was enjoined by the State's alignment with global climate agenda since Aquino's presidency and its appraisal of the value of renewable energy development for economic development. Such determination is an important factor that enabled good progress in renewable energy expansion in the country.

What constitutes domestic economic and energy security needs differs across countries. Understanding what these needs are, and assessing how renewable energy sources can potentially contribute to meeting those needs vis-à-vis existing energy sources in-use, will give an indicator of the country's disposition and determination towards developing renewable energy sources and implementing low-carbon energy transition.

**2. State deep involvement and its relative power vis-à-vis the private sector in the energy sector can push renewable energy development if it becomes part of State's strategic interests and priorities.**

The nuance of power relation between the State and the private sector is closely linked to State involvement in the sector. The more involved the State is, the more power it is likely to have vis-à-vis the private sector. However, as seen in the case of Soekarno-era Indonesia and Marcos-era Philippines, it is apparent that such power dynamics could be negotiated, thereby allowing the private sector to retain some level of authority, even though the State was deeply involved in the sector.

The case of Indonesia clearly demonstrates the significant influence of State's interests and priorities on the sector if a country has a long legacy of State deep involvement in the sector. For Indonesia, this dated back to the country's independence in 1945 that served as a critical juncture that significantly transformed its energy sector. The energy sector is particularly important for Indonesia considering its rich fossil fuel endowments that have significantly contributed to the economy since the colonial era. Fossil fuel utilisation, therefore, has strategic significance beyond meeting the country's energy needs.

In Indonesia, therefore, renewable energy development and low-carbon energy transition agenda will have to come face-to-face with the State's interests and priorities. This arguably applies in any country, but is particularly relevant in places where the State has long been embedded in the sector. This is because its interests, including those of relevant SOEs and ministries, have become more complex and deeply intertwined in the sector. The introduction of low-carbon energy transition agenda within climate mitigation context thus has to undergo multiple layers of processing vis-à-vis the State's ongoing strategic priorities. It is worth recalling that the expansion of renewable energy sources had begun since Soeharto's presidency, but it was driven mainly by economic development agenda. The mainstreaming of climate norms that began more prominently during SBY's presidency came as an extra justification for renewable energy development. Given fossil fuels' long contribution to the country's energy security and economic growth, the State saw the imperative to improve renewable energy's competitiveness by

developing domestic industrial base for renewable energy technologies as a pre-condition for their expansion. The economic value-add is meant to level the playing field, but has evidently slowed down renewable energy development in Indonesia. In view of the State's strategic interests, the synergy between climate mitigation imperatives, renewable energy development, and fossil fuel phase-out is thus still a long way coming. The State long involvement and the deep entrenchment of its strategic interests and priorities in the sector thus play an important role in influencing the country's low-carbon energy transition progress.

**3. State's determination to support the private sector can facilitate renewable energy development even when it is not yet in line with private sector's profit-driven interests.**

This is observed in the Philippines where the private sector has long played an important role in the energy sector, dating back to the colonial era. The relatively brief time when the State had a significantly more dominant role during Marcos' Martial Law era, combined with the challenged perception of the State's effectiveness in providing electricity following a period of power blackouts during Aquino's presidency, reinforced the position of the private sector as the more capable and trusted actor to provide electricity. The passage of the 2001 EPIRA shifted electricity provision back to the private sector and significantly reduced the role of the State mainly to its regulatory functions. Furthermore, it created a power relation between the State and the private sector that tilted more towards the latter given that the State became dependent on the private sector for the country's electricity provision.

The shift to the private sector placed the electricity sector largely under its profit-driven interests, rendering market forces and cost competitiveness an important determinant. Fossil fuels, most notably coal, have been regarded as the most affordable option despite the need for import, whereas renewable energy sources were still seen as a more expensive option when the Renewable

Energy Act was passed in 2008. Given the problem of high electricity tariffs that had long beset the Philippines even with coal as the main power generator, the development of renewable energy sources was thus not a natural choice for the private sector. To enable renewable energy development, the initiatives thus had to come from the State, and it must provide the necessary support for the private sector and incentivise them to that direction.

The 2008 Renewable Energy Act was designed for such purpose. President Macapagal-Arroyo's determination to expand the utilisation of renewable energy sources played an important role in pushing for the legislation, which had been deliberated for about a decade prior. By having provisions on incentives and preferential measures for renewable energy sources, the Act created a synergy between the State's vision for renewable energy development and the private sector's profit-driven interests. This successfully catalysed its expansion, as seen most notably in the growth of solar and wind power facilities in the last decade. The synergy, however, is arguably limited by the extent to which the private sector's interests are served, either by the market forces or the State's incentives. At present, this is already evidenced by the private sector's more reluctant responses to develop hydropower and geothermal despite the State's determination and incentives to expand them. In other words, although low-carbon energy transition in the Philippines has begun and is showing promise, the progress may hit stagnation at certain point in the future if it no longer serves the private sector's interests. Factors such as technological advancement, changing energy demand, and evolving regulations will affect the private sector's appetite to develop certain types of energy sources in the future, but generally, it is evident that the private sector's interests play an important role in shaping the dynamics in the energy sector.

### **Study Contribution and Future Research Agenda**

This comparative study on the Philippines' and Indonesia's low-carbon energy transition makes empirical contributions to sociotechnical transition and historical institutionalism fields. The

application of historical institutionalism concepts in examining low-carbon transition in both countries further enriches the engagement of sociotechnical transition's MLP framework that has increasingly been sensitised to factors other than innovation to explain sustainability transformations. This comparative study particularly contributes to the discussions on politics, power, and policy within sociotechnical transition literature. By analysing low-carbon transition phenomenon in developing countries with limited R&D capacity and capability such as the Philippines and Indonesia, this study complements existing studies in the sociotechnical transition literature, which predominantly look at the experiences in the developed and developing countries with stronger R&D capacity and capability.

Against such backdrop, considering that most developing countries are similar to the Philippines and Indonesia in terms of R&D capacity and capability, the approach and findings in this study can potentially be applied to examine low-carbon energy transition in other developing countries. This study demonstrates that the State matters. As such, understanding what makes State more likely or less likely to feel convinced and determined to pursue low-carbon energy transition agenda is critical. In this regard, the application of historical institutionalism concepts to trace State involvement in the energy sector and its relation with the private sector in the specific industry in the energy sector can uncover the nuances behind developing countries' responses to the low-carbon transition agenda.

Moreover, this comparative study makes an empirical contribution to the historical institutionalism field by extending its application to examine low-carbon energy transition in the Philippines and Indonesia. In doing so, it offers to broaden the scope of historical institutionalism's explanatory power beyond its typical engagement with characteristically political phenomena such as revolutions, welfare and political regimes, state formation and restructuring, among others. In addition, the focus on the Philippines and Indonesia further enriches the historical institutionalism field by bringing in the experience from two developing

countries with comparable political trajectories in their histories but showing different progress in advancing contemporary low-carbon energy transition agenda.

The comparative study also contributes to the regional study on Southeast Asia by enriching the knowledge and understanding of the progress and challenges of low-carbon energy transition in Southeast Asian countries.

From the conclusions stated above, the following ideas can be explored for further research. An in-depth study between two countries that have comparable fossil fuel endowments (either exporters or importers), or two countries that have comparable configurations in the energy sector (either State-run or private sector-run), shall be conducted to further refine the factors that affect the low-carbon energy transition progress. Deeper analysis of the State's and private sector's responses to factors like geopolitics, research and development investments and technological advancements, supply-demand trend, which are likely to influence the dynamics in global and regional markets for critical minerals, solar, wind, coal, among others, in view of a country's energy security, economic growth, and sustainability agenda, will further enhance the understanding of low-carbon energy transition progress in a country.

As this research has identified that renewable energy expansion does not automatically translate to low-carbon energy transition, further research on coal phase-out can be conducted to examine the various factors that would influence the success or failure to do so.

Considering the importance of financing, further research can investigate the effectiveness of the different mechanisms and instruments at multilateral, bilateral, or national levels that have been put in place to encourage renewable energy development in developing countries. The analysis can identify factors that have made certain initiatives more successful across developing countries, and factors that have made the overall climate financing more successful in certain developing countries compared to others.

Lastly, future research can investigate the development of the domestic capacity for green industries in developing countries, and further discuss its political, economic, and socio-economic implications. This is because the so-called green sector comes with ecological footprints despite its environment friendly branding. An in-depth understanding of its effects, especially in developing countries that are generally known for their lax environmental standards, will shade light on the consequences that accompany low-carbon energy transition. Follow-up research on ways to mitigate such consequences in developing countries will be useful to ensure the sustainability of low-carbon energy transition initiative.

## Appendix A Research Participants

**Table A.1: Research Participant List**

No.	Name	Institution	Title (Interview Date)	Transparency Category
1.	Mitzi Jonelle Tan	Youth Advocates for Climate Action Philippines	International Spokesperson (20 January 2021)	Full*
2.	Raphael (Paeng) Lopez	Green Thumb Coalition  Health Care Without Harm-Asia	Head (15 January 2021)  Project Coordinator	Full
3.	Renato Redentor Constantino	Institute for Climate and Sustainable Cities (ICSC)	Executive Director (16 January 2023)	Full
4.	Irene Maranan	ACEN	Vice President & Head, Communications & Sustainability (16 January 2023)	Full
5.	Dante M. Caraos	Bataan Nuclear Power Plant	Plant Manager (19 January 2023)	Full
6.	John Mark Napao	Solar for Hope	President and Founder (13 January 2023)	Full
7.	Artemio P. Habitan	Energy Utilization Management Bureau (EUMB), Department of Energy of the Philippines	OIC – Director III (13 January 2023)	Full
8.	Jose M. Layug, Jr.	Developers of Renewable Energy for AdvanceMent, Inc. (DREAM)	President (17 January 2023)	Full

		Previously: 1. National Renewable Energy Board (NREB)  2. Department of Energy of the Philippines	Previously: 1. Chair  2. Undersecretary	
9.	Interviewee R1	Aboitiz Power Corp	Senior Staff (10 January 2023)	Anonymous
10.	Interviewee R2	Renewable Energy Management Bureau (REMB), Department of Energy of the Philippines	Senior Official (13 January 2023)	Anonymous
11.	Jalton Garces Taguibao, PhD	University of the Philippines Diliman	Associate Professor (25 January 2021)	Full
12.	Michael Abundo, PhD	The Saab-NTU Joint Lab	Assistant Director and Programme Manager (18 February 2021)	Full (Verbal Consent)**
13.	Roger Chua	Web Philippines	President (12 February 2021)	Full
14.	Interviewee R3	Department of Energy of the Philippines	Official (26 January 2023)	Anonymous
15.	Gerry Arances	Philippine Movement for Climate Justice	National Coordinator (24 March 2021)	Full (Verbal Consent)
16.	Novan Dwi Putranto	CNBC Indonesia	Journalist (18 January 2021)	Full
17.	Norman Harsono	The Jakarta Post	Energy Journalist (10 January 2021)	Full
18.	Dwi Sawung	Wahana Lingkungan Hidup Indonesia (WALHI)	Campaign Manager for Energy and Cities (6 October 2021)	Full
19.	Dandhy Laksono	Watchdoc Indonesia	Producer (16 February 2021)	Full (Verbal Consent)

20.	Tata Mustasya	Greenpeace	Southeast Asia Regional Climate and Energy Campaign Coordinator (20 January 2021)	Full (Verbal Consent)
21.	Indra Sari Wardhani	WWF Indonesia	Former Climate and Energy Manager (26 January 2021)	Full
22.	Binbin Mariana	Market Forces	Southeast Asia Energy Finance Analyst (21 January 2021)	Full
23.	Paul Butarbutar	Indonesia Renewable Energy Society (Masyarakat Energi Terbarukan Indonesia/METI)	Executive Director (6 May 2021)	Full
24.	Hendra Sinadia	Indonesian Coal Mining Association (Asosiasi Pertambangan Batubara Indonesia/APBI)	Executive Director (25 January 2021)	Full (Verbal Consent)
25.	Dr Maxensius Tri Sambodo, MIDEDEC	Indonesian Institute of Sciences (LIPI) - Economic Research Center	Senior Researcher (18 January 2021)	Full
26.	Fabby Tumiwa	Institute for Essential Services Reform (IESR)	Executive Director (19 January 2021)	Full (Verbal Consent)
27.	Elrika Hamdi	Institute for Energy Economics and Financial Analysis (IEEFA)	Finance Analyst (27 January 2021)	Full
28.	Sugeng Suparwoto	Commission VII; Parliament of Indonesia	Head (2 September 2021)	Full (Verbal consent)

29.	Aristia Hadi Wanjaya	Commission VII; Parliament of Indonesia	Expert Staff (30 August 2021)	Full
30.	Prof. Purnomo Yusgiantoro, Ir., M.Sc., MA., Ph.D	The Purnomo Yusgiantoro Centre  Previously: 1. Indonesian Ministry of Energy and Mineral Resources  2. Indonesian Ministry of Defence	Founder (23 January 2023)  Previously: 1. Minister  2. Minister	Full
31.	Interviewee R4	Directorate of New Renewable Energy and Energy Conservation (EBTKE), Ministry of Energy and Mineral Resources of Indonesia	Senior Official (25 January 2023)	Anonymous
32.	Dr Satya Widya Yudha	National Energy Council	Member (26 January 2023)	Full
33.	Rafli Yandra	PT. Bukit Asam (Persero) Tbk	Director of Business Development (20 January 2023)	Full
34.	Interviewee R5	PT. PLN	Senior Official (24 January 2023)	Anonymous
35.	Interviewee R6	Energy-related institution	Senior Personnel (2 February 2023)	Anonymous
36.	Interviewee R7	P.T. Sumberdaya Sewatama	Senior Management (27 January 2023)	Anonymous
37.	Interviewee R8	P.T. UPC Renewables Indonesia	Senior Management (9 January 2023)	Anonymous
38.	Hageng Suryo Nugroho	Presidential Staff Office	Expert Staff (25 January 2023)	Full
39.	Prof. Dr. Ir. Anhar Riza Antariksawan	National Nuclear Energy Agency (Badan Tenaga	Former Head (21 December 2022)	Full

		Nuklir Nasional/BATAN)		
40.	Interviewee R9	P.T. Vena Energy Indonesia	Senior Management (20 January 2023)	Anonymous
41.	Y. W. Junardy	Indonesia Global Compact Network	President (3 February 2023)	Full
42.	Interviewee R10	Directorate of New Renewable Energy and Energy Conservation (EBTKE), Ministry of Energy and Mineral Resources of Indonesia	Official (25 January 2023)	Anonymous

\* “Full” denotes a written consent has been obtained to be on the record with information and data being attributed to interview respondent publicly.

\*\* “Full (verbal consent)” denotes a verbal consent has been obtained to be on the record with information and data being attributed to interview respondent publicly.

*Source: Author*

## Appendix B

### Renewable Energy Development Statistics in the Philippines and Indonesia

**Table B.1: Renewable Energy Potentials and Their Utilisation in the Philippines**

<b>Philippines</b>	<b>Total Potential (2020)</b>	<b>Installed/Generated Capacity (2021)</b>
Geothermal (GW)	0.365	1.928
Biomass (GW)	0.374	0.489
Wind (GW)	93.987	0.427
Hydro (GW)	655.034	3.752
Solar (GW)	58.110	1.317
<b>Total (GW)</b>	<b>807.87</b>	<b>7.913</b>

Source: Author compilation, data sourced from Lee, N. Dyerson, A., Hurlbut, D. McCan, I., Neri, E. V., Reyes, N. C. R., Capongcol, M. C., Cubangbang, H. M., Agustin, B. P. Q., Bagsik, J., and Leisch, J. (2020). *Ready for Renewables - Grid Planning and Competitive Renewable Energy Zones (CREZ) in the Philippines*. National Renewable Energy Laboratory (NREL), (Department of Energy of the Philippines (DOE), National Grid Corporation of the Philippines (NGCP), and United States Agency for International Development (USAID). Retrieved from <https://www.nrel.gov/docs/fy20osti/76235.pdf> [for Total Potential (2020)]; and DOE. (2021). *Energy Situationer 2021*. Taguig City: DOE. Retrieved from [https://www.doe.gov.ph/sites/default/files/pdf/energy\\_statistics/doe-pes-kes-2021.pdf](https://www.doe.gov.ph/sites/default/files/pdf/energy_statistics/doe-pes-kes-2021.pdf) [for Installed/Generated Capacity (2021)].

**Table B.2: Renewable Energy Potentials and Their Utilisation in Indonesia**

<b>Indonesia (2021)</b>	<b>Total Potential</b>	<b>Installed/Generated Capacity</b>	<b>Utilisation (%)</b>
Ocean (GW)	17.9	-	
Geothermal (GW)	23.9	2.3	9.57
Bioenergy (GW)	56.9	2.3	4.01
Wind (GW)	154.9	0.2	0.1
Hydro (GW)	95	6.6	6.95
Solar (GW)	3294.4	0.2	0.01
<b>Total (GW)</b>	<b>3643</b>	<b>11.6</b>	<b>0.32</b>

Source: Author compilation, data sourced from MEMR. (2021). *Handbook of Energy & Economic Statistics of Indonesia 2021*. Retrieved from <https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-and-economic-statistics-of-indonesia-2021.pdf> [for Total Potential and Generated/Installed Capacity]; and DEN (Dewan Energi Nasional). (2022). *Laporan Analisis Neraca Nasional*. Jakarta: DEN [for Utilisation].

**Table B.3: The Philippines' Renewable Energy Installed Capacities (2011 to 2021)**

(MW)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Geothermal	1783	1848	1868	1918	1917	1916	1916	1944	1928	1928	1928
Hydropower	3491	3521	3521	3543	3600	3618	3627	3701	3760	3779	3752
Wind	33	33	33	283	427	427	427	427	427	443	427
Solar	1	1	1	23	165	765	885	896	921	1019	1317
Biomass	83	119	119	131	221	233	224	258	363	447	489
<b>Total Renewable Energy</b>	<b>5391</b>	<b>5521</b>	<b>5541</b>	<b>5898</b>	<b>6330</b>	<b>6958</b>	<b>7079</b>	<b>7227</b>	<b>7339</b>	<b>7616</b>	<b>7914</b>
<b>Total (including fossil fuels)</b>	<b>16162</b>	<b>17025</b>	<b>17325</b>	<b>17944</b>	<b>18765</b>	<b>21423</b>	<b>22728</b>	<b>23815</b>	<b>25531</b>	<b>26250</b>	<b>26882</b>

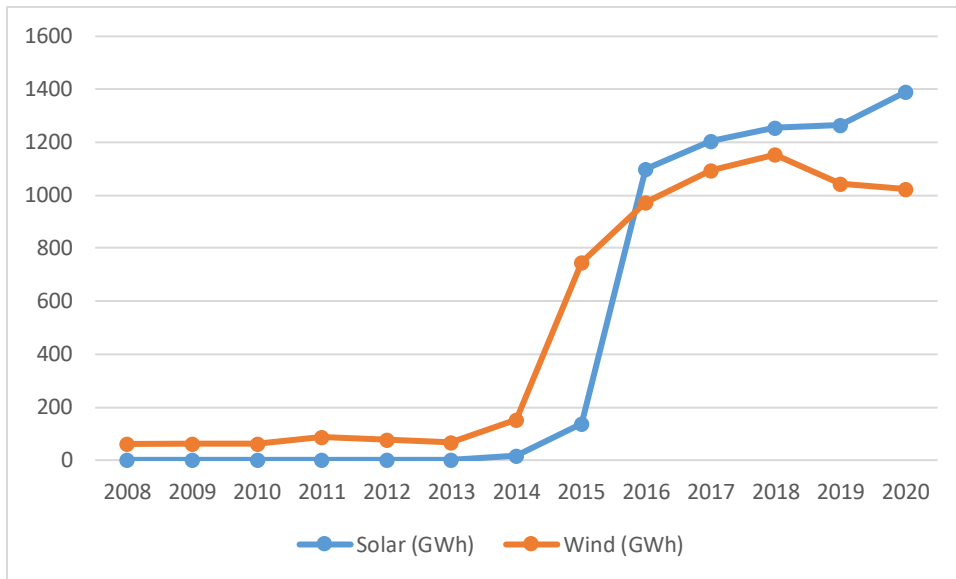
Source: DOE. (2021). *Energy Situationer 2021*. Taguig City: DOE. Retrieved from [https://www.doe.gov.ph/sites/default/files/pdf/energy\\_statistics/doe-pes-kes-2021.pdf](https://www.doe.gov.ph/sites/default/files/pdf/energy_statistics/doe-pes-kes-2021.pdf)

**Table B.4: Indonesia's Renewable Energy Installed Capacities (2011 to 2021)**

(MW)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Geothermal	16318	19714	23812	25104	26447	28352	30768	31587	34737	36668	37036
Hydropower	3881	4078	5059	5059	5069	5344	5344	4462	4620	4701	5051
Solar	1	4	9	9	37	47	55	24	105	107	155
Wind	1	1	1	1	1	1	1	143	154	154	154

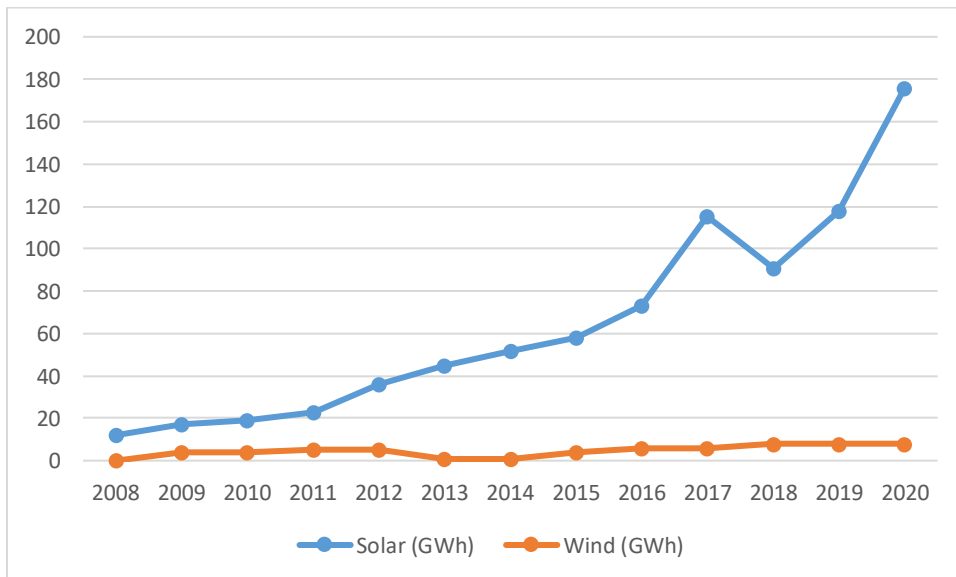
Source: MEMR. (2021). *Handbook of Energy & Economic Statistics of Indonesia 2021*. Retrieved from <https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-and-economic-statistics-of-indonesia-2021.pdf>. Note: all decimal places are rounded by author.

**Figure B.1: Solar and Wind Generated Capacities in the Philippines (2008 to 2020)**



Sources: IRENA. *Renewable Energy Statistics 2018*, and IRENA. (2022). *Renewable Energy Statistics 2022*. Abu Dhabi: IRENA. Retrieved from [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jul/IRENA\\_Renewable\\_energy\\_statistics\\_2022.pdf?rev=8e3c22a36f064fa2ad8a50e0b4437870](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jul/IRENA_Renewable_energy_statistics_2022.pdf?rev=8e3c22a36f064fa2ad8a50e0b4437870).

**Figure B.2: Solar and Wind Generated Capacities in Indonesia (2008 to 2020)**



Sources: IRENA. *Renewable Energy Statistics 2018*, and IRENA. *Renewable Energy Statistics 2022*.

**Table B.5: Renewable Energy Generation in the Philippines (2011 to 2021)**

(GWh)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Hydropower	9698	10252	10019	9137	8665	8111	9611	9384	8025	7192	9185
Geothermal	9942	10250	9605	10308	11044	11070	10270	10435	10691	10757	10681
Solar	1	1	1	17	139	1097	1201	1249	1246	1373	1470
Wind	88	75	66	152	748	975	1094	1153	1042	1026	1270

Source: DOE. *Energy Situationer 2021*.

**Table B.6: Renewable Energy Generation in Indonesia (2011 to 2021)**

(GWh)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Hydropower	12421.54	12801.99	16926.03	15170.99	13753.75	19369.7	19751.5	18323.9	18229.1	21008	20736.7
Geothermal	9371	9417	9414	10038	10048	10656	12764	14019	14100	15563	15899
Solar	0.77	3.01	5.5	6.81	5.28	21.09	29.05	19.27	54.28	125.97	119.62
Wind	5	5	0	0	4	6	0	188	482	473	435

Source: MEMR. *Handbook of Energy and Economic Statistics of Indonesia (Final Edition) 2018*.

**Table B.7: Energy Consumption in the Philippines (2011 to 2021)**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Final Energy Consumption (MTOE)	25.2	25.8	27.3	28.5	31	33.5	35.5	35.7	36.3	32.6	35.1
Energy per capita (TOE/person)	0.44	0.45	0.46	0.47	0.5	0.53	0.55	0.56	0.55	0.52	0.54

Source: DOE. *Energy Situationer 2021*.

**Table B.8: Energy Consumption in Indonesia (2011 to 2021)**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Final Energy Consumption (MTOE)*	105.62	114.58	104.89	106.79	106.35	103.33	108.01	121.21	132.01	117.65	118.84
Final Energy Consumption per capita (TOE/capita)**	0.4368	0.4662	0.4214	0.4242	0.4158	0.399	0.413	0.4578	0.4928	0.434	0.4354
Consumer Price Index	129.91	135.49	146.84	111.53	122.99	126.71	131.28	135.39	139.07	105.68	105.95
Electricity sales (GWh)	159867	173991	187541	198602	202846	216004	223134	234618	245518	242598	255069

\*The data in the source is in kBOE, but author converted it to MTOE in this table to enable easy comparison with the Philippine data.

\*\* The data in the source is in BOE/capita, but author converted it to TOE/capita in this table to enable easy comparison with the Philippine data.

Source: MEMR. *Handbook of Energy & Economic Statistics of Indonesia 2021*.

**Table B.9: Emissions in the Philippines (2011 to 2021)**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Growth rate per annum (2021)	Growth rate per annum (2011-2021)
CO2 emissions from energy (Million tonnes of carbon dioxide)	80.7	83.1	91.9	97.3	106.2	116.4	128.9	133.7	140.7	127.2	136.8	7.80%	5.4%
Total GHG avoidance from mitigation measures (ktCO2e)										1504 6.7	16232 .7		
GHG Reduction impact (%)										10.9	11.1		
GHG emission per capita (tCO2e/person)	0.79	0.8	0.87	0.91	0.98	1.06	1.15	1.18	1.22	1.12	1.18		
GHG emission per electricity generation (tCO2e/MWh)	0.47	0.48	0.54	0.56	0.58	0.57	0.63	0.65	0.66	0.7	0.7		
GHG emission - electricity generation (MtCO2e)	32.7	35	40.69	43.6 9	47.4 9	51.61	59	64.6	70.32	70.95	73.88		
GHG emission - energy (MtCO2e)	0.99	1.1	0.94	1.11	0.96	0.66	0.71	0.75	1.05	0.79	0.4		
Total GHG emission (MtCO2e)	74.65	77.07	85.78	91.22	99.3	109.2 5	120.6 9	125.5 8	132.4 5	122.5 8	130.4 5		

Source: Author compilation, data sourced from: BP. *bp Statistical Review of World Energy 2022*, 71<sup>st</sup> edition. London: BP. Retrieved from: <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf> (for CO2 emissions from energy data), and DOE. *Energy Situationer 2021* (for the rest of the data).

**Table B.10: Emissions in Indonesia (2011 to 2021)**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Growth rate per annum (2021)	Growth rate per annum (2011-2021)
CO2 emissions from energy (Million tonnes of carbon dioxide)	470.6	489.5	460.6	469	489	487.8	514.6	565.6	613.2	560.8	572.5	2.40%	2%
CO2 emissions per capita (tCO <sub>2</sub> /person)	1.93	1.93	1.77	1.89	1.89	1.85	1.95	2.13	2.25	2.07			
Total GHG avoidance from mitigation measures in electricity generation (Million tonnes of CO <sub>2</sub> )										8.78	10.37		

Source: Author compilation, data sourced from: BP. *bp Statistical Review of World Energy 2022, 71st edition* (for CO<sub>2</sub> emissions from energy data), World Bank. (n.d.c.). *CO<sub>2</sub> Emissions (metric tons per capita) - Indonesia*. Retrieved from <https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=ID> (for CO<sub>2</sub> emissions per capita data), and MEMR. (2022, January 19). *Indonesia Cuts 10.37 Million Tonnes of Carbon Emissions from Power Plants in 2021*. Retrieved from: <https://www.esdm.go.id/en/media-center/news-archives/indonesia-cuts-1037-million-tonnes-of-carbon-emissions-from-power-plants-in-2021> (for total GHG avoidance from mitigation in electricity generation data).

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