

# Coal Lock-In in Southeast Asia

## *An Analysis of Existing and Planned Coal-Fired Capacity in Southeast Asia*

### Executive Summary

Indonesia, the Philippines, and Vietnam have come into the spotlight as the first three countries chosen by the Asian Development Bank (ADB) to pilot its Energy Transition Mechanism's (ETM) early coal retirement scheme. Ahmed M. Saeed, the Vice President of the ADB, explained the concept behind the ETM in a recent interview. When asked about the focus on Southeast Asia to initiate the scheme, Saeed cited heavy reliance on coal-fired generation as the prime motivator behind this selection.

Economic development in Southeast Asia historically depended on coal-fired power generation for growth.<sup>1</sup> The abundance of coal in the region, coupled with its cost-competitiveness over alternative fuels, made it the preferred option to meet the rising demand for power.<sup>2</sup> Indonesia has vast reserves of lignite and sub-bituminous coal, making it the largest exporter of coal in Asia. Given their proximity to large coal exporters such as Australia and Indonesia, other nations such as the Philippines, Vietnam, and Malaysia have relied on imports to feed their large coal-fired generation fleets.

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To understand the ADB's initiative, it's crucial to understand how Southeast Asia's resource endowments intersect with the region's energy finance landscape. Absent from the policy debate so far is a clear picture of why coal retirement will be crucial to Southeast Asia's energy transition, and why it will be difficult to achieve without far-reaching market shifts.

IEEFA has long been focused on the issue of coal lock-in, with a particular focus on how reliance on long-term power purchase agreements (PPAs) to support coal power investments restricts regional governments' ability to shed high-emissions coal assets without severe financial damage. The data and analytics in this report aim to present a fuller picture of the problem and highlight the issues that

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<sup>1</sup>Asian Development Bank. [ADB Insight: What is ETM?](#). 22 October 2021,

<sup>2</sup> Oxford Institute for Energy Studies. [The role of coal in Southeast Asia's power sector and implications for global and regional coal trade](#). Sylvie Cornot-Gandolphe, December 2016.

policymakers and market participants must address to design any effective decarbonization plan.

## Three Countries with Different Market Structures— All Suffering from Coal Lock-In

Geographical similarities are many, but Southeast Asian countries are not homogeneous in power market and grid structures. Demographic factors such as grid access, population size, and per capita consumption play an important role in driving demand for power in developing economies like the Philippines and Vietnam, where economic growth has not yet been decoupled from electricity demand.

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Vietnam, for example, has a relatively smaller population size of 97 million,<sup>3</sup> but has a very high per capita electricity consumption, which has resulted in an installed capacity of 69.3 gigawatts (GW).<sup>4</sup> Indonesia, on the other hand, has one of the largest populations in the world, with 274 million people across a geographically diverse archipelagic landscape.<sup>5</sup> The country has a power generation fleet of 63.2GW<sup>6</sup> connected to the national grid, with a more moderate per capita power consumption. While the Philippines has a population size between Indonesia and Vietnam, it has a low per capita consumption of 0.9<sup>8</sup> megawatt-hour (MWH) per capita, leading to the smallest generation fleet of 26.3GW<sup>9</sup> amongst the three countries.

Power market structures also differ, with Indonesia following a regulated market where the state-owned, vertically integrated utility Perusahaan Listrik Negara (PLN) controls the bulk of the country's generation, transmission, and distribution assets.

In Vietnam, the state-owned electric utility Vietnam Electricity (EVN) dominates the power sector by holding a large share of its generation assets directly or through its

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<sup>3</sup> The World Bank. [Population, total – Vietnam](#). 2020

<sup>4</sup> Vietnam Electricity. [Annual Report 2021](#).

<sup>5</sup> The World Bank. [Population, total – Indonesia](#). 2020.

<sup>6</sup> International Association for Energy Economics. [Technoeconomic Analysis Of Indonesia Generation Expansion To Achieve Economic Sustainability And Zero Carbon In 2050](#). 07 June 2021.

<sup>7</sup> This is the official figure reported by Perusahaan Listrik Negara (PLN) in the latest version of the national electricity procurement plan (RUPTL). The Ministry of Environment and Mineral Resources (MEMR) Indonesia however reports a larger figure (73 GW) for this by including in the captive power generation plants as well.

<sup>8</sup> Statista. [Philippines: Per capita electricity consumption 2020](#).

<sup>9</sup> Department of Energy Philippines. [Philippines Power Statistics 2020](#).

subsidies. Other energy sector state-owned enterprises (SOEs) such as the Vietnam Oil and Gas Group (PVN) and Vietnam National Coal-Mineral Industries Holding Corporation Limited (Vinacomin) are some of the largest Independent Power Producers (IPPs) in Vietnam.<sup>10</sup> In 2020, EVN owned 46.3% of the total installed capacity in Vietnam, while the rest was held by private investors or Build-Operate-Transfer (BOT) projects.<sup>11</sup> The National Power Transmission Corporation (NPTC), a wholly owned subsidiary of EVN, controls and maintains the country's transmission network, while five distribution companies (also EVN owned) take power to the end-users.

**The Philippines' deregulated power market has evolved from a sector dominated by state control.**

The Philippines' deregulated power market has evolved from a sector dominated by state control. Via the Electric Power Industry Reform Act (EPIRA) reforms in 2001, the state-owned National Power Corporation (NPC) was dissolved, all state-owned generation assets were privatized, IPPs were handed over to the private sector, and the Power Sector Assets and Liabilities Management (PSALM) was created to oversee privatization and liquidate all the financial obligations held by NPC. The ownership of transmission assets still lies with the state-owned Philippines National Transmission Corporation (TransCo), but the grid is maintained and operated by the privately owned National Grid Corporation of the Philippines (NGCP).<sup>12</sup> Distribution of power has been handled by private distribution utilities, including Meralco, which dominates the Luzon grid, and electric co-operatives, some of which have operated since the 1900s.<sup>13</sup> <sup>14</sup> The Philippines Wholesale Electricity Spot Market (WESM) has operated in the larger grids of Luzon and Visayas since 2006 and 2010 respectively.<sup>15</sup>

Vietnam is also aiming towards a liberalized market, having introduced the Vietnam Competitive Generation Market (VCGM) in 2012 and the Vietnam Wholesale Electricity Market (VWEM) in 2019.<sup>16</sup> Competition exists on the generation end for day-ahead markets through spot trading and fixed contracts.

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<sup>10</sup> Thomson Reuters Practical Law. [Electricity regulation in Vietnam: overview](#).

<sup>11</sup> Vietnam Electricity. [Annual Report 2021](#).

<sup>12</sup> The World Bank, Public Private Partnership Legal Resource Center. [Power Sector Assets and Liabilities Management Corporation \(PSALM\)](#).

<sup>13</sup> [An Analysis of the Philippine Electric Power Industry](#). Epictetus E. Patalinghug. October 2003.

<sup>14</sup> The World Bank. [Learning from Developing Country Power Market Experiences : The Case of the Philippines](#). Rudnick et al. January 2019.

<sup>15</sup> Philippine Electricity Market Corporation. [WESM History Timeline](#).

<sup>16</sup> Friedrich Ebert Stiftung, Vietnam Initiative for Energy Transition, Climate Sense. [Prospects for a Socially Just Energy Transition in Viet Nam: 2021 and beyond](#). Koos Neefjes & Ngo Thi To Nhien. April 2021.

Despite such entities being in operation for almost a decade, spot markets in both the Philippines and Vietnam control a limited share of the total power generation. Much of the power generated is still procured through long-term power purchase agreements. In the Philippines, for example, dominant distribution player Meralco procured only 9% of its total power supplied in 2020 on the WESM<sup>17</sup>, whereas in Vietnam, 49% of the total installed capacity was known to participate directly in the Vietnam Wholesale Electricity Market in 2020.<sup>18</sup>

Indonesia, Vietnam, and the Philippines have a high share of coal in their power generation mix. In 2020, fossil fuels dominated Indonesia's power generation with coal accounting for 62.8% of the total power produced.<sup>19</sup> In Vietnam, coal produced 48.1% of the total power generated in 2020<sup>20</sup>, while in the Philippines, the figure was 57%.<sup>21</sup>

**Table 1: The Disparate Nature of Power Markets in Southeast Asia Explained by Demographic Factors**

Development Indicator	Vietnam	Indonesia	Philippines
Population size (mn)	97	274	110
Per capita consumption (MWh/capita)	2.1	1.1	0.9
Access to electricity (% of population)	99.4	98.8	95.6
Average power tariff (US c/ kWh)*	9.8	8.1	14.9
Total installed capacity (GW)	69.3	63.2**	26.3
% Coal fired capacity	31.1	49.7	41.6
Reliance on imported coal for power generation	Some domestic coal, imports from Indonesia and Australia	Abundant domestic coal	Imports 75 % of its coal mostly from Indonesia
% Renewable energy (non-hydro)	25.3	4.4	14.1
Presence of competitive markets	Competition for new generation - traded electricity is very small relative to total generation.	No competitive markets in place.	The Philippines wholesale market (WESM) covers larger grids - traded electricity is very small relative to total generation.

Sources: Country data, IEEFA estimates, World Bank, Enerdata, Statistica.com.

\* Average of Residential, Commercial and Industrial Tariffs

\*\* Official figures from PLN, MEMR reports the figure to be 72GW

Young sub-critical power plants play a significant role in coal lock-in. This high ratio of coal-fired generation can be attributed to various enabling factors. Both Vietnam

<sup>17</sup> Department of Energy Philippines. [Power Supply Procurement Plan 2021, MERALCO.](#)

<sup>18</sup> Friedrich Ebert Stiftung, Vietnam Initiative for Energy Transition, Climate Sense. [Prospects for a Socially Just Energy Transition in Viet Nam: 2021 and beyond.](#) Koos Neefjes & Ngo Thi To Nhien. April 2021.

<sup>19</sup> International Association for Energy Economics. [Technoeconomic Analysis Of Indonesia Generation Expansion To Achieve Economic Sustainability And Zero Carbon In 2050.](#) 07<sup>th</sup> June 2021.

<sup>20</sup> Vietnam Electricity. [Annual Report 2021.](#)

<sup>21</sup> Department of Energy Philippines. [Philippines Power Statistics 2020.](#)

and Indonesia have domestic sources of coal. Indonesia has an abundance of lignite and sub-bituminous coal, which serves as a cheap fuel for domestic power generation. Vietnam's excavatable coal, mostly anthracite in nature, is located in the northern province of Quang Ninh.

In these countries, a high level of state control coupled with the ready availability of national resources has led to an increased focus on coal for power generation to meet electricity demand. The addition of coal-fired generation capacity also follows a pattern of historical development. In Vietnam, some of the oldest coal power plants, such as the Vuon Hoa Light House and the Uong Bi thermal power plant date, back to its French and Soviet eras. Since then, a series of coal power plants, large and small, have been added to the grid to ensure national energy security.

**Young sub-critical power plants play a significant role in coal lock-in.**

The Philippines also continues to rely on coal to serve its baseload power needs, importing 75% of the coal consumed from Australia and Indonesia.<sup>22</sup> In the archipelago nations, coal-fired generation is concentrated within the larger grids and economic hubs, Java, Bali and Sumatra in Indonesia, and Luzon and Visayas in the Philippines.

The long-standing dependence of the three ASEAN nations on coal-fired generation has been compounded with the recent addition of large sub-critical units, over the past decade, especially in Vietnam. IEEFA's analysis reveals that 17.5GW of coal-fired capacity in Vietnam is less than ten years old, accounting for 83% of the total installed coal capacity. High ratios prevail, in Indonesia 66% (20.7GW) of the total installed coal-fired capacity is less than ten years old and, in the Philippines, likewise the figure is 58% (6.4GW).

The high mix of sub-critical facilities has particularly negative implications for carbon emissions and air pollution because they lack the technological improvements of more recent ultra-super critical facilities.

Sub-critical technology has low efficiencies (33-37%) in comparison to supercritical and ultra-supercritical power plants, which can achieve efficiencies up to 40-46%.<sup>23</sup> Sub-critical coal power plants hence burn more coal to achieve the same energy output as a supercritical power plant, leading to more carbon emissions. A study by the University of Oxford reveals that an average sub-critical coal power plant can produce 75% more carbon pollution than the latest ultra-super-critical power plant

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<sup>22</sup> The ASEAN Post. [Why Is The Philippines So Focused On Coal?](#)

<sup>23</sup> Global Energy Monitor. [Coal Power Technologies.](#)

and is 67% more water intensive.<sup>24</sup>

In Indonesia, 79% of the total installed capacity for coal employs sub-critical technology, and in Vietnam and the Philippines these figures are 76% and 75% respectively.

The high penetration of sub-critical technology reflects a range of factors. In Vietnam, domestic coal reserves are mostly anthracite, containing low concentrations of volatile matter, making it hard to burn. Hence, this coal is suitable for sub-critical combustion conditions and often needs to be mixed with imported lignite or sub-bituminous coal. Since the Philippines imports most of its coal from Indonesia, which is low quality in nature, it too has opted for sub-critical technology for the most part.

## What Coal Lock-In in Southeast Asia Looks Like Today

The governance structure and nature of ownership of coal-fired power plants complicate the lock-in issue. State-owned entities in Indonesia and Vietnam own a large portion of the coal fleet. PLN owns about 60% of the coal-fired generation assets in Indonesia, and EVN roughly controls the same percentage of coal power plants in Vietnam.

This history of government ownership intersects with various subsidy policies to create a situation where many of these plants benefit from subsidies and can depend on government support when faced with economic inefficiencies. Indonesia is reported to have provided USD 700 million in fiscal support to coal power plants in 2016-17 in direct subsidies. The country also capped coal prices at USD70/ton for the year 2018-19, and introduced a 25% domestic market obligation (DMO), to protect the country's coal fleet against price surges in global commodity markets.<sup>25</sup> Vietnam also provided subsidies in the form of state guarantees for loans to support the country's coal fleet.<sup>26</sup> Coal use is encouraged domestically, often by capping prices below international markets and exports (since 2017, domestic coal prices for electricity production have been priced almost 10% below export prices under orders from the Ministry of Finance).<sup>27</sup>

At the same time, power off-take from IPPs is secured through long-term PPAs, which guarantee that these power plants will be paid to operate for the next 25-30 years regardless of whether they would qualify on a merit order basis. This insulates them from market pressure to decommission under-performing facilities and will

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<sup>24</sup> University of Oxford. [Stranded Assets and Subcritical Coal, The Risk to Companies and Investors](#). March 2015.

<sup>25</sup> Overseas Development Institute. [G20 Coal Subsidies: Tracking Government Support to a Fading Industry](#).

<sup>26</sup> Mongabay. [Analysis: Vietnam's leadership flex shows how to drive electricity reform](#), David Brown. 6 August 2020.

<sup>27</sup> Asian Development Bank. [Regional: Opportunities to Accelerate Coal to Clean Power Transition in Selected Southeast Asian Developing Member Countries](#). October 2021.

complicate the effort to align power sector operations with cost-effective new renewables technologies.

**Table 2: Long Term Power Purchase Agreements Govern a Significant Portion of the Coal Fleet**

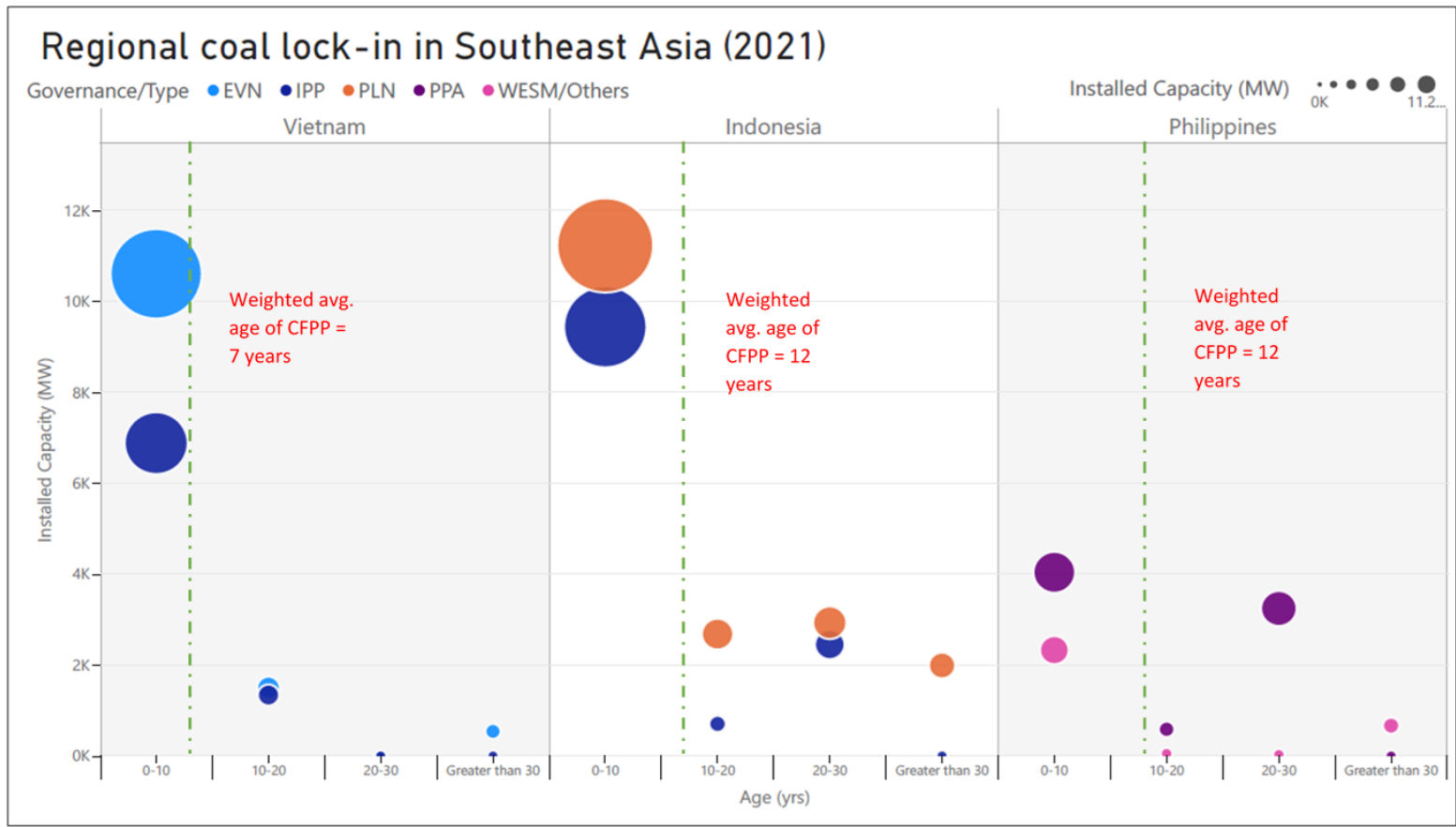
Indonesia			
Age (Yrs)	Capacity (MW)	% of Total	% IPPs
0-10	20,666	65.8%	30.0%
10-20	3,385	10.8%	2.2%
20-30	5,380	17.1%	7.8%
>30	1,990	6.3%	0.0%
<b>Total</b>	<b>31,421</b>		<b>40.1%</b>
Vietnam			
Age (Yrs)	Capacity (MW)	% of Total	% IPPs
0-10	17,484	83.8%	33.0%
10-20	2,840	13.6%	6.4%
20-30	-	0.0%	0.0%
>30	540	2.6%	0.0%
<b>Total</b>	<b>20,864</b>		<b>39.4%</b>
Philippines			
Age (Yrs)	Capacity (MW)	% of Total	% PPA Governed
0-10	6,367	58.2%	36.9%
10-20	638	5.8%	5.4%
20-30	3,273	29.9%	29.6%
>30	666	6.1%	0.0%
<b>Total</b>	<b>10,944</b>		<b>71.9%</b>

Sources: Country data, IEEFA analysis.

IPP-owned power assets, locked-in through guaranteed PPA contract structures, have driven the growth of coal in recent years. However, government ownership of coal power assets poses its own lock-in challenge. Notably, the ownership of the oldest and most polluting assets lies with state-owned utilities, as in the case of Vietnam and Indonesia (See Figure 1). Here the source of lock-in is financial gain. Despite being fully depreciated, the assets have not been retired, as they continue to generate much needed positive cash flow for their financially pressed SOE owners.



**Figure 1: Regional Coal Lock-in in Southeast Asia (2021)**



Source: IEEFA analysis.

Note: In the Philippines, after de-regulation, all state-owned coal-fired assets were privatized, and a Wholesale Electricity Spot Market (WESM) was created. However, despite the WESM being in operation for more than a decade, most of the power procured by distribution utilities and electric co-ops is governed by PPAs. Hence, instead of comparing being a state-governed ownership or an Independent Power Producer (IPP), in the case of the Philippines we had to switch to a PPA governed vs. WESM governed analysis.

EVN = Electricity of Vietnam; IPP = independent power producer; PLN = PT Perusahaan Listrik Negara; WESM = Wholesale Energy Spot Market; CFPP= Coal-fired power plant

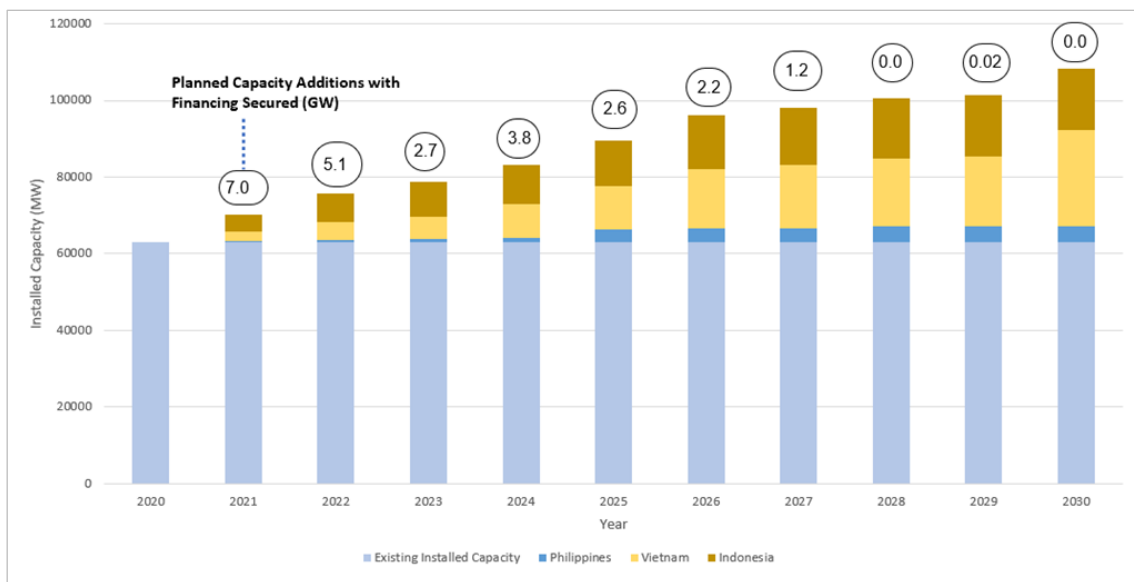


## Coal Lock-In in Southeast Asia Will Look Worse in 2025

All three nations under analysis have committed to decarbonization. The Philippines declared a moratorium on greenfield coal power generation in October 2020, Indonesia has introduced carbon neutrality goals for 2060<sup>28</sup> and Vietnam has emerged as a solar champion through the massive influx of rooftop solar PV over the past two years, as well as focusing on more renewables in its coming power development plan (PDP8). Vietnam announced a net-zero goal for 2050 at COP26.<sup>29</sup> However, these lofty ambitions, are marred by a huge caveat. All three countries have huge coal pipelines bound to come online in the next decade, with direct support from the government.

Indonesia, Vietnam, and the Philippines have a combined coal pipeline of almost 45GW, frontloaded towards the first half of the decade. Vietnam will have the largest additions in terms of absolute capacity, with almost 29GW of planned coal-fired capacity to be delivered by 2030. Most of this planned capacity will be brought online through IPPs, resulting in further lock-in through PPAs and sovereign guarantees.

**Figure 2: Yearly Coal-Fired Capacity Additions in Southeast Asia (2021-30)**



Sources: Country data, Department of Energy Philippines, Vietnam Electricity, PLN, Various media sources.

IEEFA's analysis reveals that in 2025, much of the planned capacity will be realized if plants currently under construction are brought into operation on schedule in

<sup>28</sup> East Asia Forum. [Making Indonesia's carbon neutrality a reality](#). 21 July 2021.

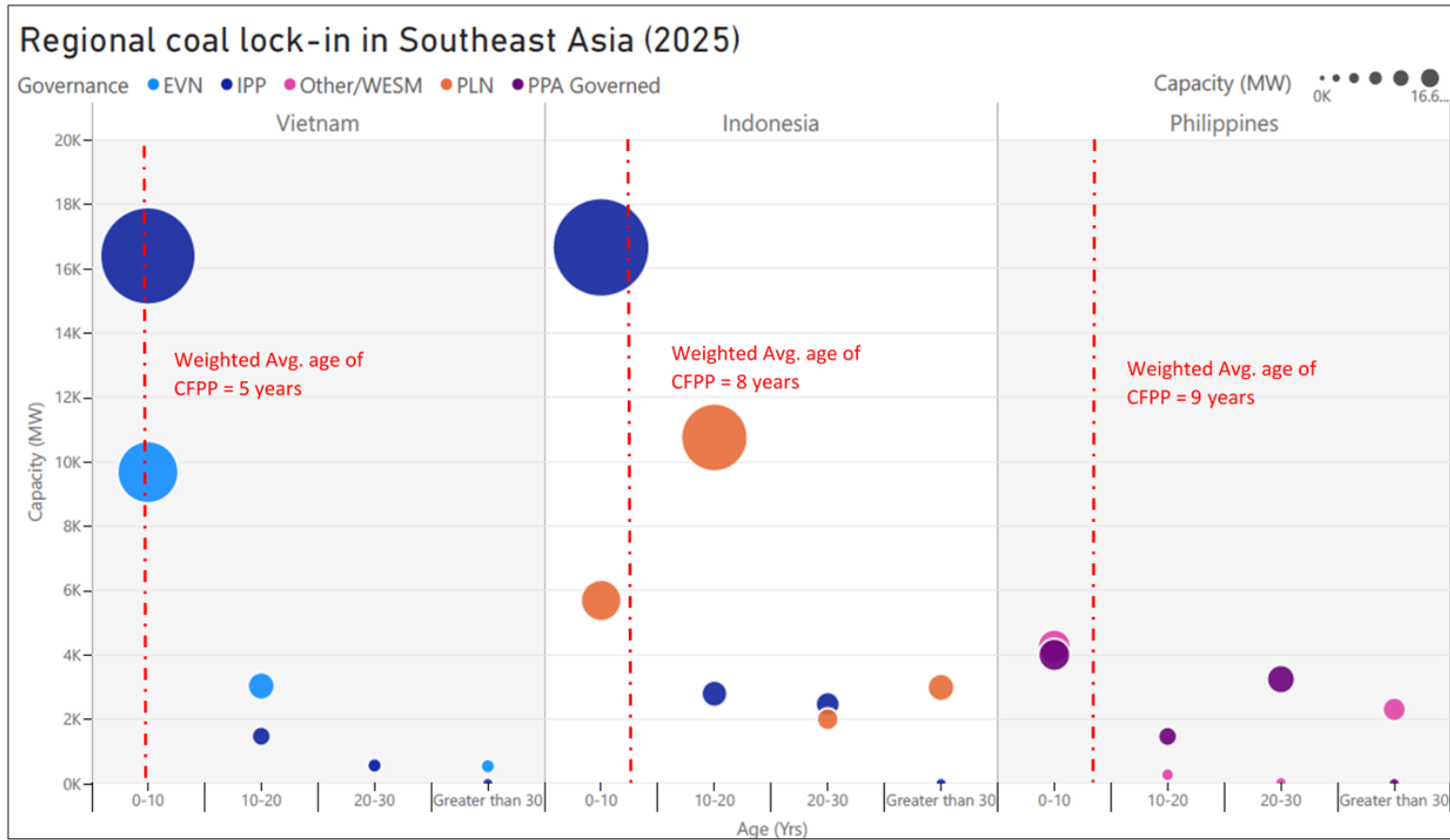
<sup>29</sup> Vietnam Briefing. [COP26 and Climate Change: Vietnam's Commitment to Reducing Emissions](#). 5 November 2021.

Indonesia and Vietnam. The scale of the lock-in becomes significantly larger, as the fleet's size under ten years exceeds 25GW in Vietnam and 22GW in Indonesia and reaches 8GW in the Philippines.

To capture the impact of fleet age on these power systems, we have calculated the weighted average age of the coal-fired power capacity in each country. This permits analysts to focus on the structural similarities and differences of these power markets and to assess how the challenge of early coal retirement will change over time. The headline results are stark. Ongoing investment in new coal-fired power plants will drive the weighted average age of the coal fleets in all three countries below ten years, with Vietnam emerging with the youngest weighted average fleet of only five years. The Technical Assistance report prepared for the ADB ETM mechanism prioritizes mature assets aged 6-15 years for retirement. Almost all identified assets are likely to opt for a full valuation of their remaining lifetimes when transferring it to a third party for retirement.

This has direct implications for the optics of the ADB's ETM scheme in terms of worsening the lock-in. Governments, such as Indonesia, will seek concessionary financing for coal retirement, while they could commission, and in some instances subsidize, new long-lived coal power assets. As older and mature coal fired power plants would be retired through the ADB ETM mechanism, a new cohort of younger plants aged less than five would enter the generation mix, backed through long term PPAs, and there to stay for at least the next two decades.

**Figure 3: Regional Coal Lock-in in Southeast Asia to Get Worse Assuming Business as Usual (2025)**



Source: IEEFA analysis.

## Will the Financing Come Through for This Planned Capacity?

Despite such extensive plans for coal-fired capacity additions in the future, these Southeast Asian governments may soon realize that there isn't nearly enough capital available to turn these plans into reality. Out of the 45GW planned through to 2030, only 25GW has secured financing, with most of the financed power plants coming online later this year or next year. Vietnam has the largest un-financed fleet, with only 38% of the planned capacity having achieved financial close.

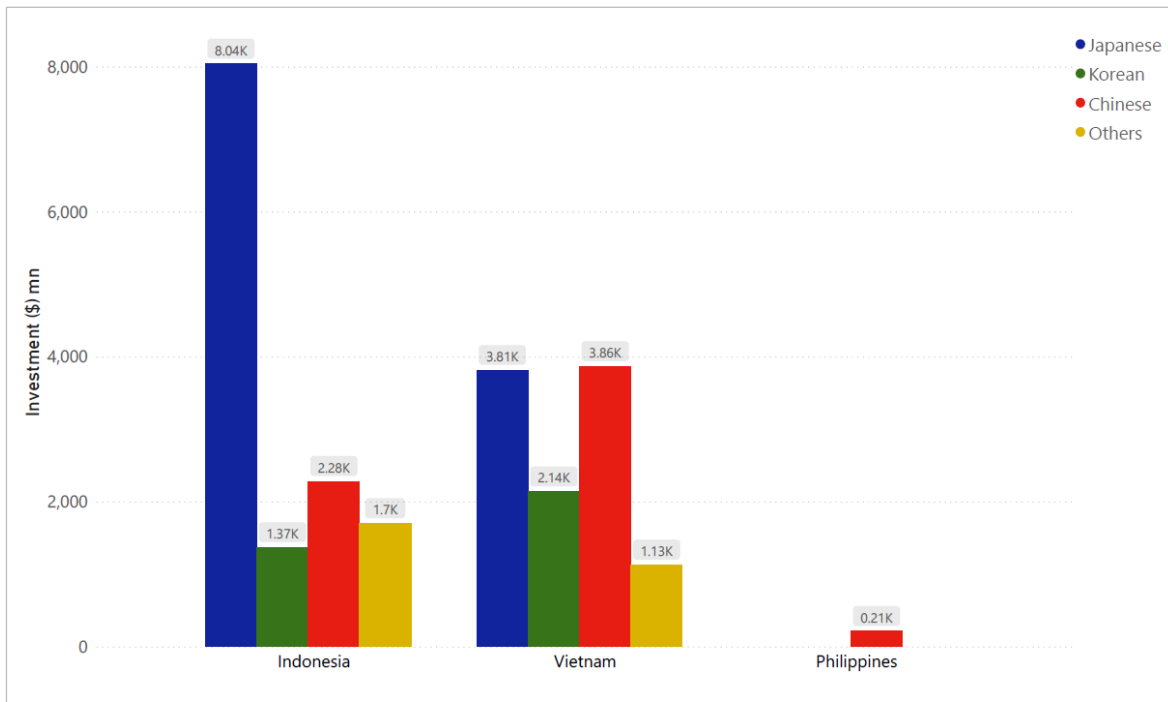
**Table 3: Planned Coal-Fired Capacity in Southeast Asia (2021-2030)**

	Planned Capacity (MW) According to National Plan	Planned Capacity (MW) With Financing Secured/Under Construction	% Planned Capacity With Financing Secured
<b>Indonesia</b>			
PLN	3,670	2,470	16%
IPP	12,178	9,358	59%
<b>Total</b>	<b>15,848</b>	<b>11,828</b>	<b>75%</b>
<b>Vietnam</b>			
EVN	3,660		0%
IPP	25,250	11,130	38%
<b>Total</b>	<b>28,910</b>	<b>11,130</b>	<b>38%</b>
<b>Philippines</b>			
Other/WESM	4,646	1,606	29%
PPA	835	835	15%
<b>Total</b>	<b>5,481</b>	<b>2,441</b>	<b>45%</b>

Sources: Country data, World Bank PPI, Project Finance International, Refinitive, IJ Global, Various media releases.

The pool of funders investing in Indonesia, the Philippines and Vietnam isn't very diverse either, with public development entities in China, Japan, and Korea providing almost all the overseas capital for existing coal-fired capacity. Therefore, it comes as no surprise to see them emerging as key funders for the planned coal-fired capacity as well.

**Figure 4: Major Sources of Financing for the Coal Pipeline in Southeast Asia (2021-2030)**



Source: IEEFA analysis.

Japanese and Chinese funders are expected to provide most of the financing for coal projects in Indonesia and Vietnam through bilateral financing from Japan Bank for International Cooperation (JBIC) and Export-Import Bank of China (CHEXIM). Export-Import Bank of Korea has also played a key role in mobilizing debt financing for large power plants in Indonesia, such as Java 9 & 10. In the Philippines, on the other hand, local banks have been providing much of the debt-financing for financed pipeline capacity, with support from commercial Chinese-Filipino banks, such as China Banking Corporation.<sup>30</sup>

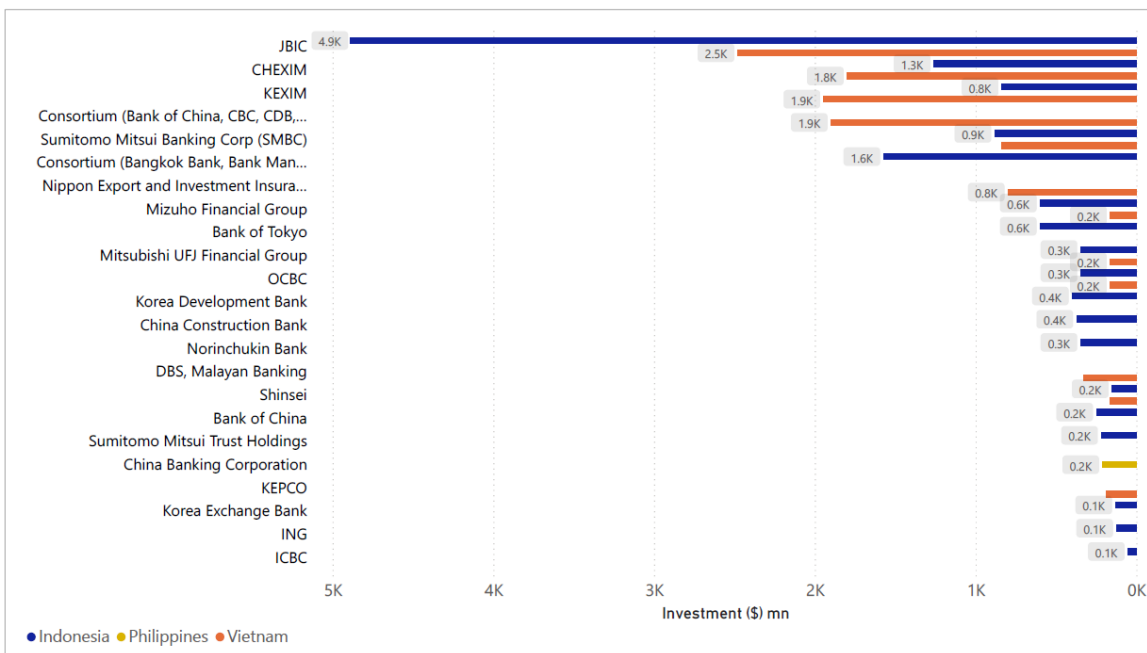
It is important to note that reliance on these narrow channels of financing can expose these power plants to a risk of being mothballed as the global space for coal financing shrinks. Displaying high ambitions in the lead-up to COP26, key players in coal financing in Southeast Asia committed to ending their support for coal projects overseas. For example, at the Leaders' Summit on Climate in April, South Korea announced a commitment to withdraw from coal financing abroad. Four weeks

<sup>30</sup> For GNPowder Dinginin Supercritical Coal-Fired Power Plant - Unit 1, Bank of the Philippines Islands, BDO Bank, China Banking Corporation, Development Bank of the Philippines, Other Security Bank, Rizal Commercial Banking Corp each provided \$138.4 million. For GNPowder Dinginin Unit 2, Bank of the Philippines Islands, BDO Bank, China Banking Corporation, Development Bank of the Philippines, Other Security Bank, Rizal Commercial Banking Corp each provided \$72.66 million in debt. The Atimonan one energy (AOE) coal-fired power plant borrowed around P107.5 billion from 8 local banks including the Bank of Philippine Islands and Philippine National Bank to raise capital for its project financing needs.

later, Japan came up with a similar announcement to end international coal financing by the end of 2021.<sup>31</sup> In September, at the United Nations General Assembly’s debate, in one of the most anticipated decisions worldwide, China’s President Xi Jinping announced an end to Chinese support for coal power plants outside of China. As demonstrated by figures 4 & 5, policy and commercial lending from these countries has been critical to creating coal lock-in in Indonesia, Vietnam, and the Philippines.

Following in the footsteps of these high-level announcements, many individual banks and financing institutions, such as the Bank of China, Sumitomo Mitsui Financial Group Inc., and the Tsingshan Group (a Chinese steel conglomerate involved in industrial coal financing in Indonesia), have announced exits from coal financing. The declining availability of finance, combined with construction delays due to the COVID-19 pandemic, impeded committed capacity from reaching commercial operations in the Philippines.<sup>32</sup>

**Figure 5: Financing Sources for the Coal Pipeline in Southeast Asia Is a Mix of Both Commercial and Policy Banks**



Sources: World Bank (PPI), Refinitiv, Project finance International, Proximo, Zawya, IJGlobal, China Aid, MoF, Various media releases, IEEFA analysis.

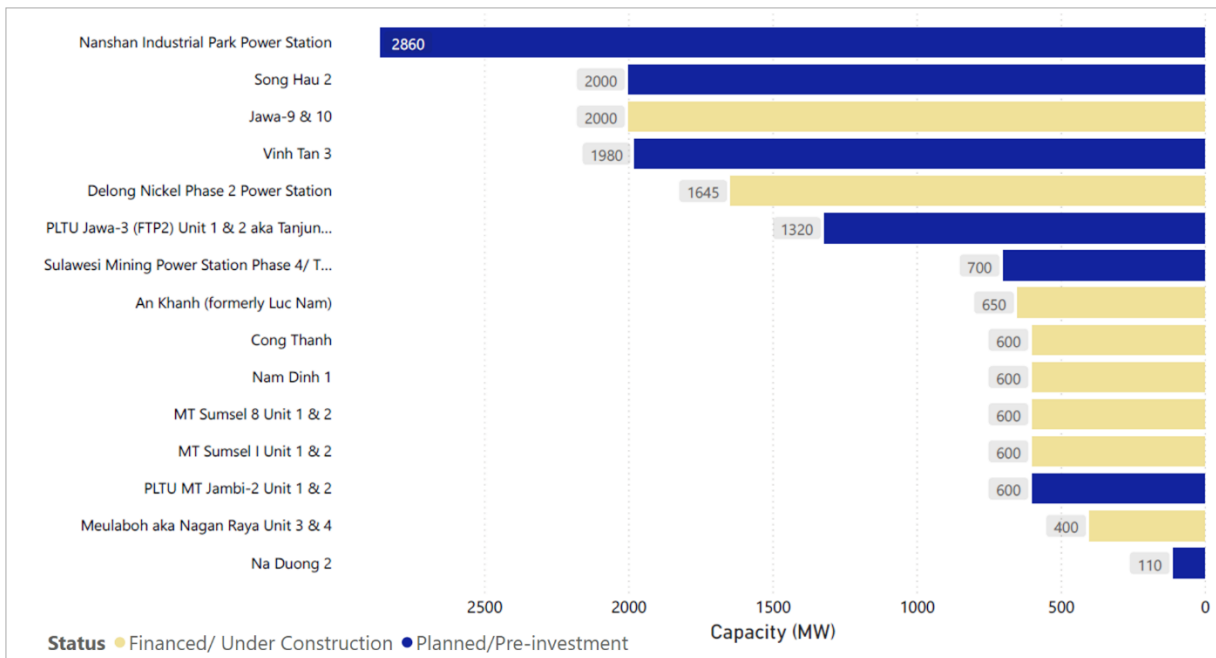
The accelerating pattern of coal financing exit announcements from governments and leading financial institutions should alert the governments of Indonesia, Vietnam, and the Philippines that their coal pipelines may no longer attract finance.

<sup>31</sup> World Resources Institute. [Overseas Coal Financing. Will China Catch Up?](#) Liu et. al. 14 June 2021.

<sup>32</sup> Department of Energy Philippines. [Philippines Power Statistics 2020](#).

Our analysis of Chinese-supported planned coal development in the three countries indicates that 6.6GW of potential coal-fired capacity is still in the pre-investment stage in Indonesia and Vietnam could be shelved after President Xi's announcement.

**Figure 6: Chinese Backed Planned Coal-Fired Capacity in Indonesia and Vietnam**



Source: IEEFA analysis, Global Energy Monitor (GEM), AidData, Zawya.

## Can Early Retirement Mechanisms Such as the ADB ETM Program Alter the Reality of Coal Lock-In in Southeast Asia?

The scale of coal pipelines in Southeast Asia illustrates the reality that coal lock-in will only get worse if business continues as usual. The nature of the lock-in itself, with support from sovereign guarantees and long-term off-take requirements baked into power purchase agreements, will ensure that these coal power plants live out their technical lifetime. Governments and multilateral banks, such as the Asian Development Bank, have been ramping up their efforts to deliver innovative market mechanisms to accelerate retirement. Still these schemes look easier to execute on paper than in reality.

The ADB's mechanism envisions the retirement of almost 50% of the coal-fired power plants in Indonesia, Vietnam, and the Philippines. The high ambitions set out by the ETM are to be appreciated, but the fact that Southeast Asia is not a homogeneous region and has quite diverse individual power markets cannot be ignored. In Vietnam and Indonesia, state-owned power companies have their own



vested interests in coal power development.

These markets have been opened to the private sector through IPPs, but long-term power purchase guarantees may again insulate these IPPs from pressure to retire early. Similarly, if reverse auctions are deployed for price discovery, there is no guarantee that the state-owned power companies that own a large share of coal-fired generation will bid against themselves to lower the auction price.

If the mechanism is not designed properly, there is a high risk that it would merely provide cash flows to ageing power plants near retirement already, or worse, prolong the life of polluting assets by giving them an additional grace period to retire. This entrenched coal lock-in may not be simple to navigate around. A thorough study of these markets is needed to ensure that early retirement programs are transactional and deliver the desired result, targeting appropriate assets and meeting the expectations of various stakeholders involved.

## About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. [www.ieefa.org](http://www.ieefa.org)

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