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MIND THE GAP

Exploring Options to Finance Decarbonization of the Energy Sector in Indonesia and Vietnam

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Prepared by AMPERES, IRID and LPEM UI
Tien Le, Tarek Ketelsen, Moekti Handajani Soejachmoen, Alin Halimatussadia, Ajeng Andayani, Fachry Afifi, Masako Nemoto, Keithe Ben, Lavinia Quagliata, & James Quinton

Reviewed and edited by ANU
Thang Nam Do, Dharani Sabba, Genevieve Newey

Abbreviations

BAU	Business-As-Usual
BOT	Build-Operation-Transfer
CAGR	Compound Annual Growth Rate
ECT	International Energy Charter
ENDC	Enhanced Nationally Determined Contribution
EVN	Vietnam Electricity
GENCO	Generation Company
GFANZ	Glasgow Financial Alliance for Net Zero
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
IPCC-AR6	The Sixth Assessment Report of the Intergovernmental Panel on Climate Change on Mitigation
IPG	International Partners Group
IPP	Independent Power Producer
JETP	Just Energy Transition Partnership
LNG	Liquefied Natural Gas
LULUCF	Land Use, Land-Use Change and Forestry
NDC	Nationally Determined Contribution
NLDC	National Load Dispatch Centre
NZE	Net Zero Emissions
PDP VIII	Vietnam's 8th Power Development Plan for the period of 2021-2030, vision to 2050
PLN	Perusahaan Listrik Negara
RUPTL	National Electricity Supply Business Plan
SEA	Southeast Asia

Highlights

Southeast Asia (SEA) represents **one of the biggest deficit regions in the world in terms of finance for climate mitigation**. To meet the Paris Agreement goal, **the annual clean energy investment in SEA** must increase by at least five-fold from the current level to USD $150 billion for the period of 2026-2030.

Indonesia needs **an annual investment of USD $28.5 billion between 2022-2060**, equivalent to 2.7% of the country's GDP in 2020, to realize its energy transition plan that aims to achieve net-zero emissions by 2060 or sooner.

Vietnam aims to achieve net-zero emissions by 2050 and needs **an annual investment of $13.5 billion between 2021-2030** and **USD $20.0–26.2 billion between 2031-2050** to decarbonize its power sector in accordance with the Power Development Plan VIII, or equivalent to 3.9% and 5.8-7.6% of Vietnam's GDP in 2020 respectively.

The governments of Indonesia and Vietnam need support to fill their financing gap and there is a growing dependency of both electricity sectors on **private investment** to fill the gap and fulfill sovereign net-zero aspirations.

Looking forward COP 28 **presents a strategic opportunity for Indonesia and Vietnam to leverage further developed country support for climate mitigation through the Global Stocktake process**.

Global climate finance context

The Paris Agreement was adopted in December 2015 as a landmark legally binding commitment by 196 countries to limit global warming to 2 degrees Celsius (2°C) compared to pre-industrial levels through the reduction of greenhouse gas emissions. Article 2.1c of the agreement states that finance flows must reflect the efforts towards low greenhouse gas emissions and climate-resilient development.[1] However, the legacy of greenhouse gas emissions (GHGs) has not been equal, with developed nations responsible for the majority of historic emissions.[2] In an effort to promote equity, the Paris Agreement draws a distinction between developed and developing nations both in terms of the ambition of their obligations and their financial requirements. In 2009, at COP15 in Copenhagen, recognizing the significant financial challenge facing developing countries, a promise to deliver an annual finance flow of USD 100 billion by 2020 from developed to developing countries for climate actions was made. The Paris Agreement re-stated the obligation of developed countries to provide financial resources for developing countries in support of their mitigation and adaptation actions (Article 9.1). The USD 100 billion target was then extended to 2025 at COP21. To date, it has never been met.

Since the Paris Agreement, there have been efforts to curtail emissions, but these have been insufficient.[3] The Sixth Assessment Report of the Intergovernmental Panel on Climate Change on Mitigation (IPCC-AR6)[4] raised concern over a large emissions gap between the global target to keep the temperature rise below 1.5°C and the aggregation of all nationally determined contributions submitted before COP26. In other words, even if the current national emission targets are fully implemented, the world is likely on course for exceeding 1.5°C of warming during this century. For the energy sector, it is concerning that globally, governments are planning to produce more than twice the amount of fossil fuels by 2030 than what is required to keep emissions below 1.5°C warming.[5]

Climate finance took center stage at COP27 in Sharm El Sheikh, marked by a historic agreement on a loss and damage fund at the end; however, negligible progress was made to address the enormous shortfall in the transition to a low-carbon world. According to IPCC, the current financial flow for mitigation needs to grow by three to six-fold to reach the average level needed until 2030 to keep global warming below 2°C.[6] Particularly, between now and 2030, the annual global investment in **energy** must double to reach more than USD $4.5 trillion in 2030, of which annual investment in clean energy must triple from approximately USD $1.3 trillion in 2021 to over USD

[1] UNFCC, 2023. What is the Paris Agreement? Accessed at https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.
[2] IPCC, 2022. Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.002.
[3] Climate Action Tracker, 2022. State of Climate Action. Accessed at https://climateactiontracker.org/documents/1083/2022-10-26_StateOfClimateAction2022_kR0sbBZ.pdf
[4] IPCC, 2022. Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.002.
[5] SEI, IISD, ODI, E3G, and UNEP. (2021). The Production Gap Report 2021. http://productiongap.org/2021report
[6] IPCC, 2022. Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.002.id

$4 trillion in 2030.[7] These concerning gaps were highlighted in the Sharm el-Sheikh Implementation Plan COP27, and further discussions are expected to be held at COP28, including determining whether and how developed economies can fulfill their commitment to mobilizing USD $100 billion of public and private climate finance for developing nations.

For developing countries of Southeast Asia (SEA), the challenge is even greater. **Between now and 2030 annual investment for mitigation in Southeast Asia must increase by 6-12 times above the current annual financial flow to achieve the Paris Agreement commitments.[8]** The region's investment shortfall is greater than the respective level of all developing countries, making SEA one of the biggest finance deficit regions in the world. Its energy sector attracted an annual investment of USD 70 billion in the period of 2016 and 2020, of which less than USD 30 billion went to clean energy technologies[9].

The financial challenges facing Indonesia and Vietnam's plans for net-zero power systems

SEA is facing enormous challenges in decarbonizing its dynamic, growing economy. Power generation in SEA is dominated by fossil fuels, with natural gas and coal accounting for about 67% of the total in 2020.[10] Indonesia and Vietnam, in particular, have 31.2 GW and 30.9 GW of coal power capacity operating and under development, ranking them the world's fourth and fifth, respectively.[11] Both Indonesia and Vietnam have committed to net zero targets and recently became the next target countries of the Just Energy Transition Partnership (JETP), which aims to speed up coal phase-out and accelerate the energy transition in the fast-growing economies.

Indonesia's decarbonization agenda

Nationally Determined Contribution

In the Enhanced Nationally Determined Contribution (ENDC), Indonesia aims to reduce 915 Mt of CO_{2eq} (31.89%) compared to the Business-as-usual (BAU) scenario by 2030 with their own resource (CM1 or unconditional contribution) and up to 1,240 Mt of CO_{2eq} (43.20%) with international support (CM2 or conditional contribution). By 2030, Indonesia targets a reduction in energy sector emissions of 358 Mt CO_{2eq} and 446 Mt CO_{2eq} in the unconditional contribution and conditional contribution, respectively (**Table 1**). Although an updated estimate of the financial needs for the new target is not yet available, it was estimated that a total of USD $285 billion would be needed in the period

[7] IEA, 2022. World Energy Outlook 2022. IEA, Paris https://www.iea.org/reports/world-energy-outlook-2022.
[8] IPCC, 2022. Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.002.
[9] IEA, 2022. Southeast Asia Energy Outlook 2022. IEA, Paris. Retrieved from https://iea.blob.core.windows.net/assets/e5d9b7ff-559b-4dc3-8faa-42381f80ce2e/SoutheastAsiaEnergyOutlook2022.pdf
[10] ACE, 2021. ASEAN Power Updates. ASEAN Centre for Energy.
[11] Gao, X., Davidson, M., Busby, J., Shearer, C., Eisenman, J. 2021. The Challenges of Coal Phaseout: Coal Plant Development and Foreign Finance in Indonesia and Vietnam, Global Environmental Politics 0:0, 2021, https://doi.org/10.1162/glep_a_00630.

of 2018-2030 to meet the GHG emissions reduction target of 41% set out in the earlier NDC.[12]

Power Sector and Net-zero Emissions Roadmap

Electricity generation increased more than three-fold from 2000 to 2020, with a compound annual growth rate (CAGR) of 5.87%[13]. In 2020, total electricity generation was 290 TWh, of which over 60% was generated from coal-fired power plants; oil and natural gas together made up 20% of the total electricity generation, while only under 1TWh was produced from wind and solar sources[14]**.** Indonesia's Energy roadmap towards carbon neutrality constitutes a timeline of strategic actions for the energy sector, and a joint commitment between the government and energy stakeholders to achieve Net Zero Energy (NZE) by 2060 by removing 1,789 million tons of CO_{2eq} from the power sector. The road map breaks activities into 5-year time slices and sets clear, quantified targets for the transformation of power generation.

In the periods of 2021 – 2025 and 2025 – 2030, the focus is on accelerating rooftop solar PV, waste-to-energy generation and pumped storage.

- In the periods of 2030 – 2035 and 2035 – 2040, the focus shifts to introducing the green hydrogen industry, massive expansion of Battery Energy Storage (BESS), acceleration in solar PV and wind turbine power plants, expansion of geothermal and introduction of nuclear power.
- In the periods between 2040 – 2060, green hydrogen is expected to gradually replace liquefied natural gas (LNG); by 2060, all electricity will be generated by renewable sources.

Targets are also set for each time slice for demand management with an early focus on electrification of transport, roll out of induction cookers, expansion of the household gas network and fuel switching to biofuels. For the period of 2051-2060, utilization of carbon capture and storage for industrial applications is also proposed.

A plan for coal phase-out is included to achieve the net-zero energy target. According to government projections, coal capacity will peak at 60GW in 2030. In the three following decades 2030-2060, 38 GW from coal-fired power plants will be retired, of which the largest coal capacity reduction of 31 GW will happen between 2041-2050. However, it also means that coal will remain present in the country's power mix until 2056.

According to the MEMR **Indonesia's power sector will need USD $1,108 billion or USD $28.5 billion annually to meet the NZE target, which is 2.7% of Indonesia's GDP in 2020.**[15] Under the NZE roadmap, in 2060, power capacity is expected to reach 708 GW, an increase of 8.6 times the capacity in 2022 (**Exhibit 1**). The total capacity including BESS and pumped hydropower storage would be 768 GW, which will require a total financial need of USD

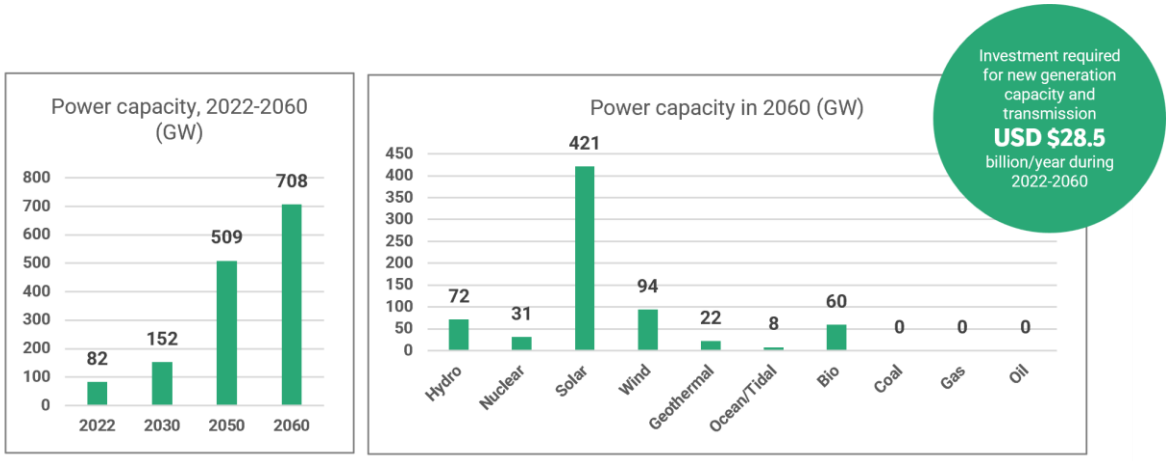
[12] Republic of Indonesia, 2021. Indonesia Third Biennial Update Report, under the United Nations Framework Convention on Climate change. Accessed at https://unfccc.int/documents/403577.
[13] Calculated based on the IEA's database. Accessed at https://www.iea.org/countries/indonesia
[14] IEA. (2023). Indonesia database. Accessed at https://www.iea.org/countries/indonesia
[15] MEMR, 2022. Presentation at the ETP COP27 policy dialogue on 2 November 2022

$994.6 billion from now until 2060. At the same time, USD $113.4 billion is required to develop associated transmission infrastructure.

Table 1 | Indonesia's updated NDC in 2022 with sectoral GHG emissions reduction targets (Mt CO2eq).
Source: Indonesia's Enhanced Nationally Determined Contribution.[16]

Sector	GHG emission reduction - unconditional contribution (CM1)		GHG emission reduction - conditional contribution (CM2)	
	Compared to BAU scenarios (%)	Reduction amount (Mt CO_{2eq})	Compared to BAU scenarios (%)	Reduction amount (Mt CO_{2eq})
Energy*	12.5	358	15.5	446
Waste	1.4	40	1.5	43.5
IPPU	0.2	7	0.3	9
Agriculture	0.3	10	0.4	12
Forestry and Other Land Uses (FOLU)**	17.4	500	25.4	729
TOTAL	**31.89**	**915**	**43.2**	**1240**
Note: ** Including fugitive.* *** Including emission from estate and timber plantations*				

Exhibit 1 | Indonesia's Power Generation mix: (LEFT) projected growth in installed generation capacity 2022 – 2060; (RIGHT) Projected power generation mix in 2060.
Source: MEMR, 2022.[17]



Vietnam's decarbonisation agenda

Nationally Determined Contribution

In the latest Nationally Determined Contribution (NDC) submitted on 8 November 2022, Vietnam committed to reducing 15.8% of GHG emissions unconditionally, which is equivalent to 146.3 Mt CO_{2eq} GHG reduction compared to the BAU scenario by 2030. If an additional USD $65 billion in

[16] Republic of Indonesia, 2022. Enhanced National Determined Contribution, submitted to UFCCC on [23] September 2022.
[17] MEMR, 2022. Presentation at the ETP COP27 policy dialogue on 2 November 2022.

financial flows from international support is in place, the country can increase the reduction target to 43.5% or 403.7 Mt CO_{2eq} during the same period.

The energy sector has the largest potential to reduce GHG emissions. The 15.8% committed GHG reduction in the unconditional contribution is made up of 7% (64.8 Mt $CO2_{eq}$) reduction from the energy sector and 8.8% (81.5 Mt $CO2_{eq}$) from other sectors including Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), waste and industrial processes. International support of USD $46 billion for the energy sector is promised to increase the reduction by an additional 17.4% or 162.2 Mt CO_{2eq} (**Table 2**).

Power Sector and Net-zero Emissions Roadmap

Vietnam's electricity demand increased rapidly over the last two decades with a CAGR of 11.64%[18]. The increased demand was met mostly by the intensive deployment of coal and large hydropower power plants. By 2020, the total electricity production reached 240TWh, of which, fossil fuels and hydropower accounted for 65% and 30% respectively. Although solar PV boomed in Vietnam between 2019 and 2020 and accounted for 26% of the total capacity by 2022, it only contributed 13% to the 2022 electricity generation.[19]

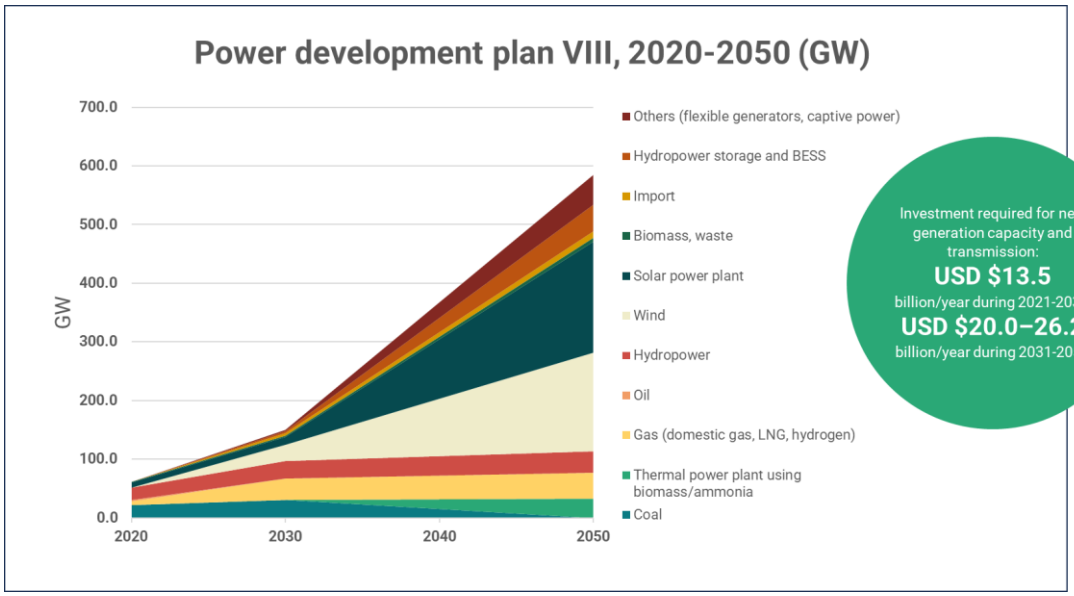
Vietnam's 8th Power Development Plan for the period of 2021-2030, vision to 2050 (PDP VIII) was finally approved on 15 May 2023 after 3 years of drafting, discussion and modification. The announcement of Vietnam's NZE target at COP 26 provided greater clarity for the PDP process. According to the approved PDP VIII[20], the total power capacity in 2050 is expected to reach 491-573GW, which is an 8.0-9.3-fold increase of the 2020 capacity.[21] Coal will continue to be relied upon in the short term, peaking in 2030 at 30 GW, and supplemented by gas; after that, fuel at thermal power plants will gradually be replaced with biomass and ammonia. The newly added capacity between 2030-2050 will be mostly solar PV and wind, along with the incorporation of 31-46GW of energy storage into the system in the forms of pumped hydro storage or batteries. By 2050, there will be no coal in the power capacity mix, while the renewables share is expected to reach 67.5 – 71.5%. Implementation of this plan requires an annual investment of $13.5 billion between 2021-2030 and USD $20.0–26.2 billion between 2031-2050[22], equivalent to 3.9% and 5.8-7.6% of Vietnam's GDP in 2020 respectively (see **Exhibit 2**).

[18] Calculated based on the IEA's database.
[19] EVN. (2023). Vietnam Electricity in 2022–Challenges in development direction. https://cosodulieu.evn.com.vn/pages/cms/news-tap-doan-dien-luc-viet-nam-nam-2022---thu-thach-huong-phat-trien-id-6448.html#:~:text=Trong%20%C4%91%C3%B3%2C%20t%E1%BB%95ng%20c%C3%B4ng%20su%E1%BA%A5t,t%E1%BB%B7%20tr%E1%BB%8Dng%2029%2C0%25
[20] This is projected in a high-load scenario adopted for management purposes. The total projected capacity is 502 GW if excluding rooftop solar and captive capacity.
[21] This excludes capacity for export, rooftop solar and renewables capacity for hydrogen production.
[22] Proposal letter 8129/TTr-BCT dated 16 Dec 2022.

Table 2 | Vietnam's NDC, submitted on 8 November 2022

Sector	GHG emission reduction unconditional contribution			GHG emission reduction conditional contribution		
	Compared to BAU scenarios (%)	Reduction amount (Mt CO_{2eq})	Financial need (millions USD)	Compared to BAU scenarios (%)	Reduction amount (Mt CO_{2eq})	Financial need (millions USD)
Energy	7.0	64.8	14,464.4	24.4	227.0	60,561.4
Agriculture	1.3	12.4	2,122.8	5.5	50.9	16,102.2
Land Use, Land-Use Change and Forestry	3.5	32.5	3,927.4	5.0	46.6	5,494.9
Waste	1.0	8.7	916.6	3.2	29.4	2,726.1
Industrial Processes	3.0	27.9	310.0	5.4	49.8	1,950.1
Total	**15.8**	**146.3**	**21,741.2**	**43.5**	**403.7**	**86,834.7**

Exhibit 2 | Vietnam Power Development Plan VIII, 2020-2050.
Source: Decision 500/QĐ-TTg dated 15 May 2023.



The financial challenges

Indonesia and Vietnam are two of the largest and fastest-growing power sectors in ASEAN. They both have a legacy as vertically integrated electricity sectors operated by state-owned monopolies, and they are both heavily dependent on fossil fuels. Together, they require the order of USD $42 million per year in the short term and more than USD $50 million per year in the longer term to achieve effective decarbonization. During the COP policy dialogue, participants discussed the key challenges to meeting this financing need, grouping the conclusions into three main types of challenges.

First, persistent and high rates of economic growth drive continual high demand for increased electricity generation capacity. Keeping up with increasing demand to ensure a reliable national power supply is a major

reason why investment needs for decarbonization remain persistently high for the coming decades.

Second, commitments to decarbonise both existing and future generation portfolios require sweeping regulatory and market reforms to level the playing field for renewables without compromising the affordability of energy access. Managing the energy transition whilst also instituting reforms towards competitive wholesale and retail markets is a major challenge for the Indonesian and Vietnamese power systems. At the same time, market reforms are essential. The power sectors have grown substantially in both countries to the point that it is becoming increasingly difficult for public finance to meet the sector's investment needs. As seen in Exhibit 1 and Exhibit 2, these countries will need an average annual investment in the power sector to the scale of 2.8% (Indonesia) and 3.9-7.8% (Vietnam) of their economy in 2020 from now until they achieve the net-zero energy targets. These are huge financial requirements that Indonesia and Vietnam need to fill in, and private investment is essential in meeting this need.

Third, both Indonesia and Vietnam have opened the door for private sector investment in power generation as Independent Power Producers (IPP) participating in a nascent wholesale electricity market, yet the development of most power generation assets still relies on finance sources from state-owned companies. PT Perusahaan Listrik Negara (PLN) is the national power utility in Indonesia; this entity, together with its holding companies, owned 45 GW or 65% of the installed capacity by 2022.[23] PT PLN aims to expand the role of IPP's in the country's power generation profile, estimating that 26.3 GW out of 40.6 GW of planned additional capacity would need to come from private investment in the next decade.[24]

Similarly, Vietnam is also on the same pathway to liberalize power generation ownership and made some noticeable progress towards wholesale market reform. Historically, state-owned companies accounted for the majority of power generation capacity.[25] The share of IPPs and build-operation-transfer (BOT) projects in the power system has increased gradually since 2000, especially in small and medium-scale hydropower. Private investment in renewables (solar and wind) was minimal until the government introduced favorable feed-in tariffs during 2019 – 2020. According to the National Load Dispatch Centre (NLDC), EVN and its GENCOs currently hold about 30 GW or 38% of the installed capacity, whereas private-developed capacity is slightly higher at 32 GW. The remaining includes about 8 GW of BOT projects, 8 GW from state-owned corporations outside of EVN, and 0.6 GW from import.[26] However, private sector investment has stalled as a result of the long delay in the finalization of PDP VIII and issues surrounding the integration of built renewable power plants into the system due to insufficient grid capacity.

Apart from generation, other segments of the power sectors, such as transmission, distribution and market operation, rarely saw any participation from the private sector. In Indonesia, these activities are retained under the monopoly of PLN. On the other hand, Vietnam saw the effectiveness of amendments to the Law on Electricity in March 2022, which opened the door

[23] PT PLN. (2023). Statistics PLN 2022. https://web.pln.co.id/statics/uploads/2023/05/Statistik-PLN-2022-Final-2.pdf

[24] As quoted in National Electricity Supply Business Plan for the period 2021-2030 (RUPTL 2021-2030). PT PLN. (2021). Rencana Usaha Penyediaan Tenaga Listrik (RUPTL). https://web.pln.co.id/statics/uploads/2021/10/ruptl-2021-2030.pdf

[25] Asian Development Bank. (2015). Assessment of power sector reforms in Vietnam—Country Report. https://www.adb.org/sites/default/files/institutional-document/173769/vie-power-sector-reforms.pdf

[26] Bao Dau tu. (2023). EVN chỉ còn chiếm 15% công suất nguồn điện. https://baodautu.vn/evn-chi-con-chiem-15-cong-suat-nguon-dien-d193483.html

for non-state actors to participate in transmission grid development, though details on implementing regulations and incentive mechanisms for this are still missing and no private transmission projects have commenced.

Key recommendations for financing the energy transition in Indonesia and Vietnam

1

Fossil-fuel-reliant economies of SEA should treat decarbonization as a matter of national energy security.

The shift to renewable energy has multiple benefits for developing countries, particularly those that import fossil fuels. Fossil fuel commodity prices demonstrably affect the economics of the energy sector and the financial performance and reliability of the electricity services industry. Since 2020, the COVID-19 pandemic, combined with the war in Ukraine drastically altered commodity prices. Coal, for example, has increased from $50 USD/T in 2020 to over $400 USD/T in 2022.[27] A similar trend is evident with natural gas, where prices increased from around $2 USD/MMBtu, peaking at $9.7 USD/MMBtu in August 2022 and rebounded to around $4 USD/MMBtu by the end of 2022.[28] In 2023, prices for both coal and gas have dropped significantly; however, higher and more volatile fuel prices have a direct impact on energy security for countries like Vietnam. For Indonesia, a net exporting coal country, the high global prices for coal have induced a more complicated signal. On the one hand, Indonesia's coal companies have experienced large profit margins and strong improvements in operating cash as interest in Indonesia's coal exports has grown; however, on the other hand, increasing global demand for Indonesian coal exports, coupled with low capital investment in coal production capacity could have mixed impacts on the Indonesian power sector.[29] For both Indonesia and Vietnam, investment in renewable energy generation, storage and transmission infrastructure is an investment in energy security, which also protects these two rapidly growing economies from the economic shocks of fossil fuel price volatility.[30]

2

Indonesia and Vietnam need to reform policy environments to unlock the private sector's large appetite to invest in renewables.

The scale of financing needed to ensure decarbonization and achievement of COP/PARIS Agreement goal is massive and cannot be met by governments alone. The governments of Indonesia and Vietnam need support to fill the financial requirement and there is a growing dependency of both electricity sectors on private investment to fulfill sovereign net-zero aspirations. However, the current status of the electricity market and policy environment in both countries represent a major barrier to private financing, including foreign investment. State-owned utilities still monopolize electricity services, while historic subsidies skew the economics of electricity generation towards

[27] Trading Economics. (2023). Coal. https://tradingeconomics.com/commodity/coal
[28] Trading Economics. (2023). Natural Gas. https://tradingeconomics.com/commodity/natural-gas
[29] IEEFA. 2022. High Coal Prices could boost Indonesia's Energy Transition. Institute for Energy Economics & Financial Analysis. August 2022 https://ieefa.org/media/2970/download?attachment
[30] Vietnam is more vulnerable to impact of global commodity price volatility because it is a net importer of coal, while Indonesia remains a net exporter.

existing coal and fossil fuel power stations and incumbent investors and operators.

In the regulatory space, long-term inconsistency in the enabling policies and unfavorable power purchase agreements have made the private sector cautious about investing in renewables in both Indonesia and Vietnam. Although there are efforts to reshape policies to attract private sectors, governments need to harmonize the capital, regulatory and policy tools at their disposal to provide clear and consistent support for renewables that leverage public investment to attract private capital to their national electricity sectors.

Policy reform is key in setting the tone and context for legally binding agreements, nationally determined commitments, and market sentiment. In this context, there is a strong need to align development pathways to climate objectives. These include mitigating risk, addressing market failures, correcting policies, providing incentives and providing opportunities to leap-frog cultural and technological milestones. According to the International Energy Charter (ECT) 's energy investment risk assessment[31], both Indonesia and Vietnam have a similar investment risk profile. Generally, they both receive a low-level risk from foreign investors to finance renewable energy projects. However, they score poorly in the electricity industry market structure and competition. The ECT gives Indonesia a rating of 31 and Vietnam a score of 49 for electricity market competition. A combination of state-based electricity generation and a slow reduction in legal and regulatory risks associated with energy investments means that these key ASEAN countries perform poorly in enabling measures for clean energy and regulatory independence.

Without greater commitment to these reforms, Indonesia and Vietnam will continue to struggle to mobilize the required amount of private funding needed to meet their decarbonization commitments. As noted in the ECT 2022 Energy Investment Risk Assessment, decarbonization requires a larger role for the private sector, which requires governments to improve resilience, transparency and predictability regulatory frameworks if private sector investment is to be increased in new markets with insufficient public funding.[32]

3 Indonesia and Vietnam should capitalize on new finance mechanisms that are emerging in the global energy markets.

In the global energy market, new and potentially innovative financial structures present opportunities for developing Southeast Asian countries in pursuit of their Paris Agreement goal and COP decisions. For instance, the central bank network is expanding and changing the direction of financial flows. As the physical and disruptive risks of climate change become more apparent, central banks have become more receptive and responsive to financing decarbonization. As a first step, central banks have started stress-testing climate change risks. International monetary policy is now informed by climate risks in the context of debt stress and negative credit, especially for emerging economies.

Tied to central banks is the creation of green bonds as a tool for accelerating climate investments. In addition to evaluating the standard financial characteristics, investors also assess the specific environmental purpose of the projects that the bonds intend to support. Furthermore, increased liquidity

[31] International Energy Charter, 2022. Energy Investment Risk Assessment. Accessed at https://eira.energycharter.org/component/attachments/attachments.html?id=11950
[32] Ibid.

in green projects will have the added benefit of supporting carbon trading markets and existing renewable energy infrastructure.[33]

Blended finance[34], the combination of public and private equity, is emerging as one instrument important to creating environments for emerging economies to transition more swiftly to decarbonized energy assets. As the cost of renewable energy sources decreases, fossil fuel sources become less prevalent in new constructions. The goal of blended finance is to mix different investor risk tolerances and expected rates of return.[35]

The correct choice of financial instrument to advance decarbonization is crucial. If governments are serious about reaching their net zero goals, they need to enshrine blended finance policy reforms. A leading public/private organization that has emerged is the Just Energy Transition Partnership (JETP). The JETP model was pioneered at the COP26 Summit in Glasgow, where an International Partners Group (IPG) of France, Germany, the United Kingdom, the United States of America, and the European Union announced a ground-breaking long-term USD $8.5 billion fund to help South Africa reform their policy and market frameworks.

In November 2022, on the sidelines of the Group of 20 summit in Bali, Indonesia signed a US$20 billion agreement with JETP.[36] USD $10 billion of this fund will come from members of IPGs, while the other USD $10 billion will come from members of Glasgow Financial Alliance for Net Zero (GFANZ). The Indonesia JETP calls for renewables to comprise at least 34% of power generation by 2030. The JETP also targets accelerated retirement of coal-fired power plants, with power emissions to peak by 2030 at an absolute value of no more than 290 million metric tonnes of CO2 equivalent. To achieve the reduction targets the Indonesian government has implemented the National Renewable Energy development strategy.

Around the same time, USD $15.5 billion from the JETP was also committed to Vietnam to help the nation move faster from coal power to renewable energy[37]. These target reforms are designed to reduce Vietnam's peak metric tonnes of carbon emissions from 240 to 170 by 2030, a reduction from a peak of 37 Gigawatts of coal-fired electricity in the system to a peak of 30.2 GW, and to increase the target of renewable generation from 36% to 47% in the system by 2030. The JETP targets were formalized in the recent approval of Vietnam PDP VIII, along with an emphasis on the condition that only the JETP support is fully implemented. The JETP fund is equivalent to 33.6% of the international support Vietnam needs to decarbonize the energy sector by 2030, as estimated in its NDC (**Table 2**).

[33] World Bank, 2015. What are green bonds (English). Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/400251468187810398/What-are-green-bonds

[34] Blended finance is the combination of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets. One example is the use of sovereign capital to derisk private investment.

[35] IPCC, 2022. Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.002.

[36] PLN. (2023). Just Energy Transition Partnership. Accessed at https://web.pln.co.id/pln-jetp/jetp-home

[37] Vietnam Briefing, 2022. Unpacked: Vietnam US$15.5 billion JETP agreement, accessed by 19 December 2022 at https://www.vietnam-briefing.com/news/vietnams-jetp-agreement-unpacked.html/.

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Looking forward, COP 28 presents a strategic opportunity for Indonesia and Vietnam to leverage further developed country support for climate mitigation through the Global Stocktake process.

At COP27, a transitional committee for the Loss and Damage Agreement provided sets of resolutions and recommendations to access and utilize the climate fund, with a focus on providing aid to low-income countries. A major criticism of COP 27 was that negotiations focused on the financing of measures to address the impacts of climate change whilst ignoring the important task of eliminating fossil fuels[38].

Looking ahead to COP28, this conference is expected to restore a focus on climate mitigation, including:

- address critical issues surrounding decarbonization and energy transition, including the acceleration of investments in renewable energy, enhancement of energy efficiency, and development of new financial mechanisms to support the energy transition;
- highlight the crucial need for robust international cooperation to achieve global decarbonization targets and ensure equitable access to clean energy for all, particularly in developing countries.
- serve as a key platform for policymakers, industry leaders, and civil society organizations to collaborate and drive tangible progress toward a sustainable, low-carbon future.

A key tool in the delivery of these objectives is the completion and reporting of the first Global Stocktake as originally prescribed in Article 14 of the Paris Agreement. The Global Stocktake is a party-driven process to inventorize the actions and progress that countries and other stakeholders are making towards meeting the ambition of the Paris Agreement. It is expected that COP 28 will use the Global Stocktake to identify gaps in progress and develop solution pathways to accelerate progress in decarbonization.

For developing countries of Southeast Asia, COP 28 presents an opportunity for national stocktakes and discussion around solution pathways to leverage short-term financial support towards decarbonization from developing countries. Both Indonesia and Vietnam have set net zero commitments by 2060 and 2050, respectively, with only modest progress targeted for the coming decade. Indonesia and Vietnam could raise the ambition levels of decarbonization targets and prepare a workable plan for decarbonization by 2030. They could then use these evidence-based pathways to negotiate expanded support from Developed Countries.

Keeping global warming below 1.5°C, or even 2.0°C will require much more significant progress by all countries, including SEA, in the coming years. Indonesia and Vietnam should leverage their national stocktakes and the expected focus on financing mitigation to secure developed nation support that brings net zero ambitions closer to 2030.

[38] Burelli et al. (2022). COP27 'loss and damage' fund: A historic decision amid discouraging results. Accessed at https://theconversation.com/cop27-loss-and-damage-fund-a-historic-decision-amid-discouraging-results-195186

About Energy Transition Roundtables

The Southeast Asia Energy Transition Partnership (ETP) https://www.energytransitionpartnership.org/ is a multi-stakeholder platform that aims to accelerate the energy transition in Southeast Asia and deliver the Paris Agreement targets on climate change by bringing together Government Donors, Philanthropies and Partner Governments. The ETP offers a strategic opportunity for multiple actors from government, civil society, and the private sector actors to come together, and leverage their expertise and resources to support Governments' understanding and advance a more ambitious agenda of reform to optimize the Southeast Asian energy transition.

The Energy Transition Roundtables is a two-year capacity building and networking program that aims to provide an opportunity for the region's energy transition stakeholders – in particular, mid-career policymakers from identified Southeast Asia countries (Vietnam, Indonesia and the Philippines) and regional level bodies – to engage in an intensive 24-roundtable series on the energy transition.

The roundtables are delivered by the Australian National University (ANU) and Australia-Mekong Partnership for Environmental Resources & Energy Systems (AMPERES), in partnership with the Institute for Economic and Social Research, Faculty of Economics and Business, University of Indonesia (LPEM UI), the Indonesia Research Institute for Decarbonization (IRID), Ateneo School of Government (ASOG), University of San Carlos (USC), and MOIT's Electricity & Renewable Energy Consulting, Training and Information Centre (ECTIC).

The COP Policy Dialogue organised on 2 November 2022 is a high-level strategic discussion bringing together experts from Australia and 29 COP delegates from Indonesia and Vietnam to take stock of progress made on COP 26 commitments, share insights and lessons on decarbonising national electricity systems and identify the strategic issues that frame the agenda for effective negotiations at COP 27. This publication summarises and continues the discussion of this event.