

Stainesbridge



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## ASEAN + ANZ's Net Zero Transformation Map

Where do we stand after Cop-27 and what more needs to be done.

# ASEAN + ANZ’s Net Zero Transformation Map

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## Where do we stand after Cop-27 and what more needs to be done.

### Executive Summary

This paper attempts to highlight the progress the ASEAN + ANZ region has made in addressing climate change, identify some of the challenges, and propose solutions to accelerate the journey towards Net Zero. The author’s approach is analogous to a strategic consultant’s proposal in a transformation project. Under this approach, the focus is placed on identifying the largest sources of emissions and focusing the resources to significantly reduce, if not eliminate, them. The challenge is in executing this transition without derailing economic growth and this is where more attention and support are needed.

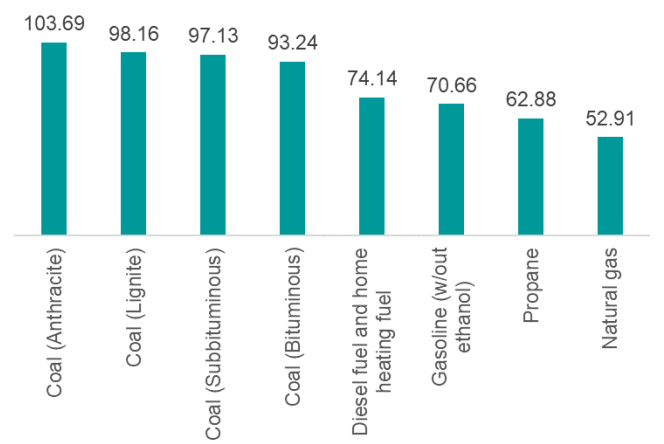
### 1. What is Net Zero?

Not to be confused with carbon neutral that only focuses on carbon emissions, Net Zero focuses on all greenhouse gas (GHG) emissions and how to equalize the amount introduced into the atmosphere with the amount removed from it. Net Zero takes a more holistic approach on the environmental impact of one’s activity and true leadership at any major polluting organization will further extend the definition to cover non-gas emission pollutants such as waste disposals into rivers and landfills. The challenge with calculating Net Zero is that it is meant to cover the entire value chain, a proposition that continues to elude us to this day. This is only the first of several challenges yet to be aligned in our quest towards Net Zero.

Despite the above distinction between the two terms, the industry and accordingly, the media, has focused in on CO<sub>2</sub> emissions because they represent the largest component of GHG emissions.<sup>1</sup> Leveraging on this is the focus on minimising the energy derived of coal types because they represent the highest CO<sub>2</sub> emitter as shown in Figure A.

Figure A: CO<sub>2</sub> Emission Coefficients by Fuel Type<sup>2</sup>

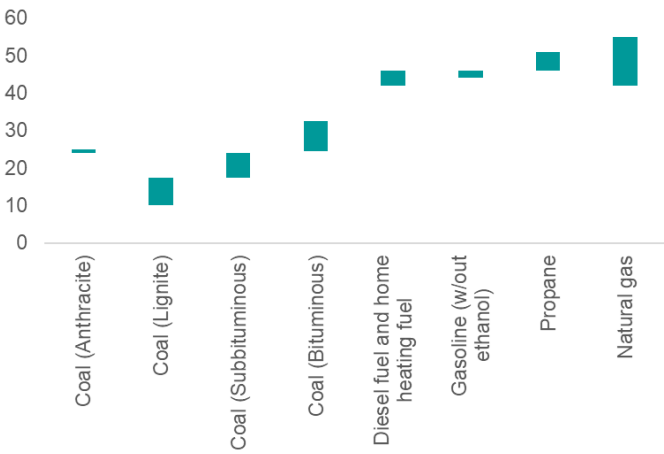
This table plots the CO<sub>2</sub> emission coefficients in kg per Million Btu



Coal also loses out on the efficiency level as measured by the amount of energy output by fuel weight processed, as shown in Figure B.

Figure B: Energy Density by Fuel Type (in MJ/kg)<sup>3</sup>

This table plots the amount of heat released during combustion. The heat value, also referred to as energy or calorific value, is a measure of a fuel's energy density and is expressed in energy (joules) per specified amount (e.g., kilograms).



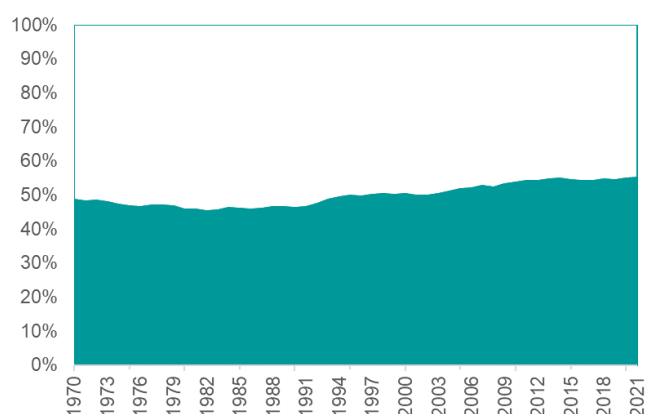
While the focus on coal is justified and there is general consensus on moving away from coal, the precarious balance of global energy generation and trade is complicated by the

geopolitical landscape with events such as the Russia-Ukraine conflict which resulted in embargoes on Russia – the world’s second largest natural gas producer. It is yet to be seen how nations that planned for a coal-to-natural gas transition respond to such situations. The hope is this episode should accelerate the deployment of renewable energy among nations as part of their energy security strategy that should also align with their GHG emission reduction targets.

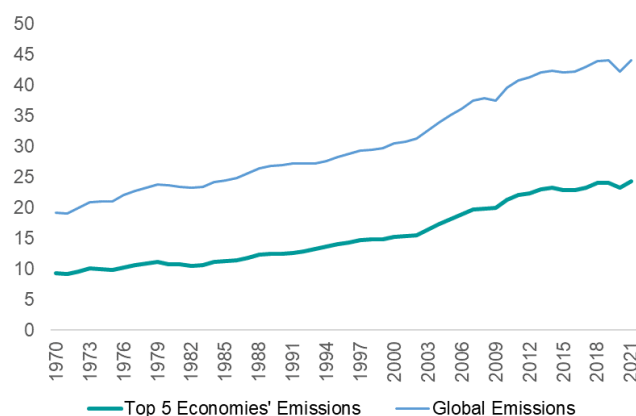
## 2. History Suggests a Positive Correlation between Economic Growth and GHG Emissions

Historical data provides evidence of the positive correlation between the largest economies and their GHG emission levels. Excluding the years of the COVID-19 pandemic, emission growth has exceeded GDP growth. It is thus not surprising that the five largest economies (United States, China, Japan, Germany, and India) which account for half of the world’s population contributes to a higher >50% share of total global emissions.<sup>4</sup> While Figure C shows that this group’s share of emissions has risen slightly over the decades, taken together with Figure D tells a very different story: major economies continue to emit an increasing amount of CO<sub>2</sub>.

**Figure C: CO<sub>2</sub> Emissions of the 5 Largest Economies as a Percentage of Total Global Emissions<sup>5</sup>**



**Figure D: CO<sub>2</sub> Emissions (in Gt)<sup>6</sup>**



Geopolitical uncertainty has the potential to derail countries' plans to get to Net Zero.

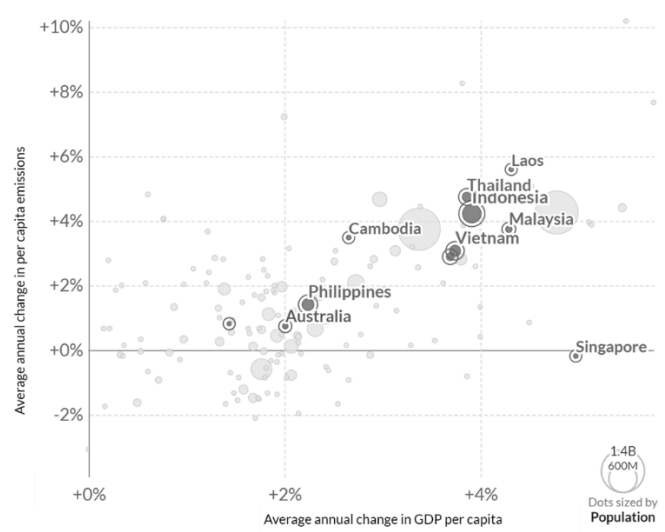
Fortunately, at the latest UNFCCC’s Conference of Parties – COP27 – held in Egypt in November, these nations maintain their commitment to reduce their GHG emissions, albeit to varying degrees of urgency and via different strategies. Unfortunately, and worryingly, global GHG emission continues to trend upwards. Climate advocates agree that more should be done but also acknowledge that it would have been even worse without the climate change actions to date.

## 3. As ASEAN + ANZ Continues on its Growth Trajectory, it too must bear the Responsibility for the Environment

Over the past four decades, the ASEAN + ANZ region has collectively experienced steady growth, as measured by GDP per capita. However, synonymous with other regional growth achievements, the ASEAN + ANZ growth is thus far heavily dependent on GHG emitting energy sources. Again, taking CO<sub>2</sub> as a proxy for all GHG and because it represents the largest component of GHG emissions, Figure E shows the average annual change in recent time. While the average CO<sub>2</sub> growth hovers in the single digit range, one needs to remember that this is incremental and with the effect of compounding, over time the level of emissions increases exponentially. Set the growth in GHG emissions against the backdrop of continued degradation of CO<sub>2</sub> absorbing mechanisms (e.g., deforestation) in the region and the outlook is dire.

Figure E: CO<sub>2</sub> Emissions per capita vs. GDP per capita, 1970 to 2018<sup>7</sup>

This chart plots CO<sub>2</sub> emissions from fossil fuels and industry only – land use change is not included.

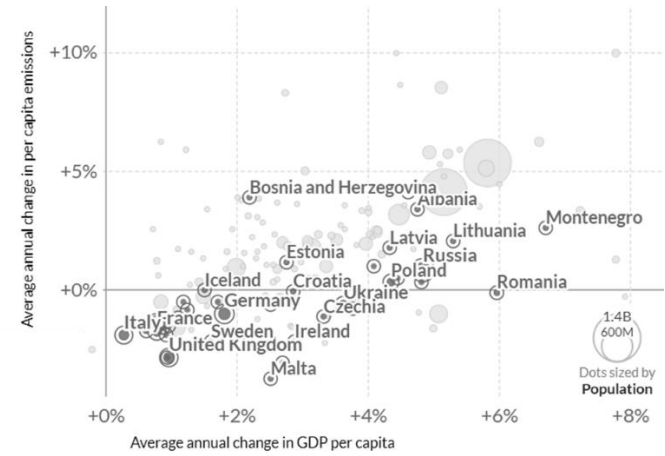


A major concern among developing countries is the trade-off between economic growth and the strategies to attain Net Zero. Despite the historical data on the major economies, transitioning to clean energy can be done while still maintaining positive net economic growth. Several European countries have demonstrated in the past two decades that this can be accomplished. See Figure F. Regionally and for developing countries, Cambodia’s “Long-Term Strategy for Carbon Neutrality (LTS4CN)” provides a blueprint that delivers net economic benefits to the GDP by 2050.<sup>8</sup> These are but a few examples of how to minimise the trade-offs between economic growth and the path to Net Zero.

Balancing economic activity with climate change action is key to attain buy-in and accelerate the transition.

Figure F: CO<sub>2</sub> Emissions per capita vs. GDP per capita, 2000 to 2018<sup>9</sup>

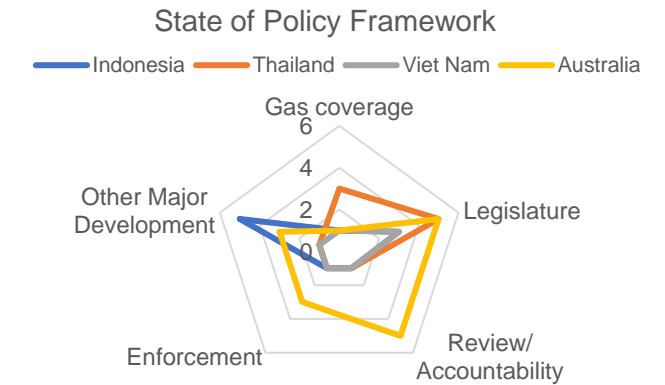
This chart plots CO<sub>2</sub> emissions from fossil fuels and industry only – land use change is not included.



On the global movement to Net Zero, ASEAN+ANZ has acknowledged and demonstrated its commitment to addressing climate change by ratifying the Paris Agreement of 2015. Most countries have also offered their emission reduction target and net zero goal. Figure G provides lists each country’s emission contribution and Net Zero target.

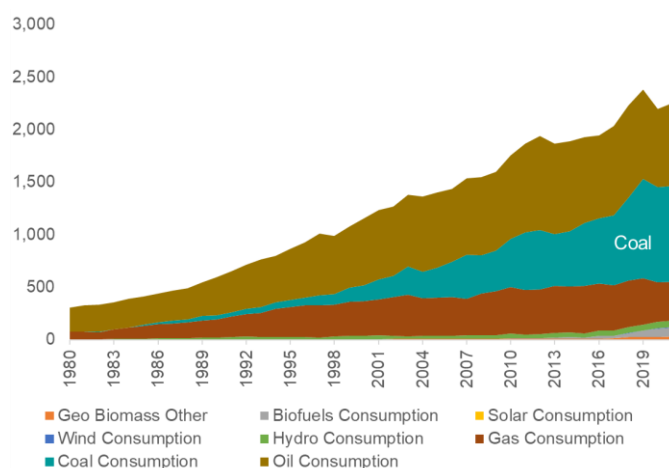
Figure G: ASEAN+ANZ Commitments to GHG Emission Reductions and State of Policy Framework for Top 4 Emitters<sup>10</sup>

	Ratified Paris Agreement	2021 CO <sub>2</sub> Emission (% of Global)	Net Zero Target
Brunei	✓	0.02%	2050
Cambodia	✓	0.12%	2050
Indonesia	✓	1.94%	2060
Lao PDR	✓	0.08%	2050
Malaysia	✓	0.59%	2050
Myanmar	✓	0.26%	N.A.
Philippines	✓	0.53%	N.A.
Singapore	✓	0.14%	2050
Thailand	✓	1.19%	2065
Viet Nam	✓	0.98%	2050
Australia	✓	0.97%	2050
New Zealand	✓	0.10%	2050

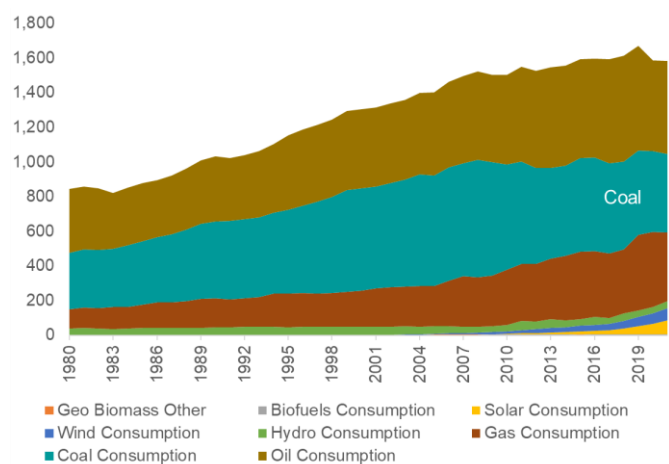


Despite the general commitment, it is evident that the heaviest emitters in the region will require more time and support for their transition. Unsurprisingly, of the top four GHG emitters in the region, coal remains among the top sources of energy as depicted in Figures H thru K.

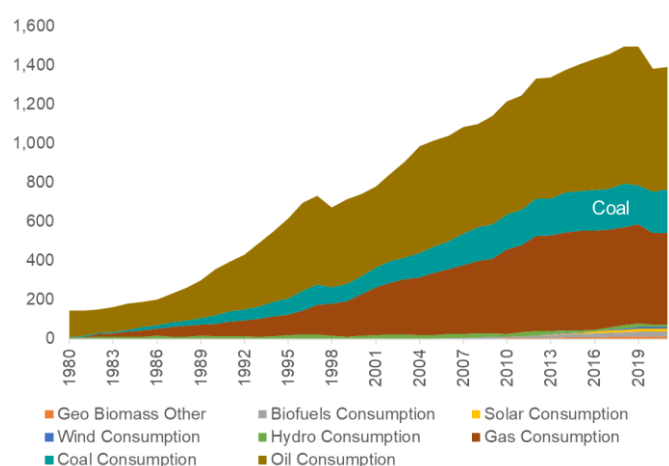
**Figure H: Indonesia's CO<sub>2</sub> Emissions Sources (in TWh); 1980 - 2021<sup>11</sup>**



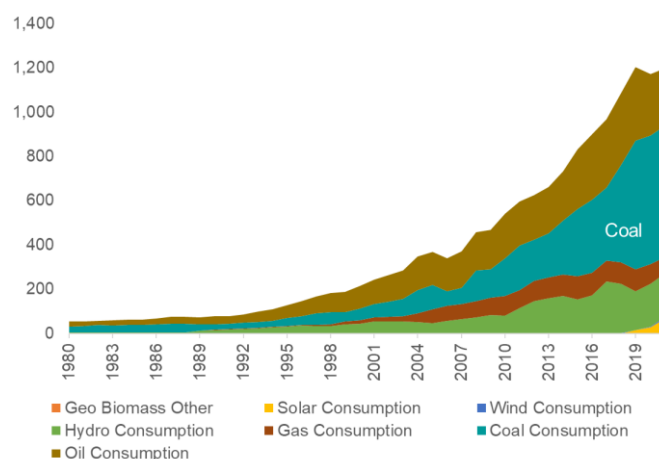
**Figure I: Australia's CO<sub>2</sub> Emissions Sources (in TWh); 1980 - 2021<sup>12</sup>**



**Figure J: Thailand's CO<sub>2</sub> Emissions Sources (in TWh); 1980 - 2021<sup>13</sup>**



**Figure K: Vietnam's CO<sub>2</sub> Emissions Sources (in TWh); 1980 - 2021<sup>14</sup>**



#### 4. What Industry Factors are Required to Attain Net Zero?

**Prioritise the biggest emission reduction opportunity.** Adopting a holistic and coordinated vantage point, the approach to make in-roads in and accelerate the region's path to Net Zero is to focus on the eradication of coal-powered plans. A reduction in supply should drive up prices and dampen demand. Given their intense carbon profile compared to other fossil fuels, as shown in Figure A, and their significant installed capacities both online and soon to be online, they remain a drag on any progress towards any Net Zero goal.

There are three broad industry factors required to attain Net Zero: Accounting, Financing, and Policy.

##### a. Accounting: Measure to Track Progress

*The Focus on Measuring Emissions along the Supply Chain while Well-intentioned Ignores the Urgency at Hand.* Measuring GHG emissions across the supply chain comprises of three scopes: Scope 1 comprises of GHG emissions resulting from activities directly owned and or controlled by an entity. Scope 2 encompasses GHG emissions resulting from the generation of the energy used in an entity's operations. Scope 3 are GHG emissions that feed into the entity's operations generated by other players along the value chain.

Several concerns have been raised such as double counting GHG emissions along the value chain, lack of consensus on agreed-upon GHG



emissions measures and the requirement for audits to list a few.

Kaplan and Ramanna<sup>15</sup> propose a fascinating approach of using blockchain to account for stock of GHG emissions as a product or service moves along the supply chain. This seems to be best workable solution yet as it leverages on existing accounting principles and can be implemented within existing accounting systems. However, this proposal is not without challenges: it struggles in the context of emerging markets where we have yet to attain the levels of measurement and accountability in developed economies. This proposal also poses a challenge for developed markets because GHG emissions will appear on the balance sheets as a liability item and we have seen creative accounting and structuring move liabilities off-balance sheet (recall: Enron), thus requiring more effort in audits. While the above concerns can be addressed over time, unfortunately, time is not a luxury we enjoy. An easier iteration of this approach is to prioritise the requirement for every entity to measure its own Scope 1 and 2 GHG emissions followed by governments and buyers' setting binding GHG emission limits at their tendering/ purchasing functions. Regardless of what is implemented, accountability and transparency are key pillars to sustained climate change action; without which we will most certainly miss our Net Zero targets.

#### **b. Financing: Responsible Investing; Financial Support; and Income Substitution**

**True energy transition leadership.** Recently, institutional investors have made it known that they have sold or are exiting their investments in coal-powered plants. While this is a step in the right direction, we call for more to be done by these behemoth investors. When deciding to exit the coal business, institutional investors were faced with three options. To date we generally see them take the easiest path which puts the world at a disadvantage. However, the ending is yet to be written and there is an opportunity for these investors to demonstrate

true leadership and align their portfolio's duration with that of their members' investment/retirement horizon.

*Option 1- The Path of True Leadership that drives the energy transition:* Accelerate the development of renewable energy and as they come online, reduce the corresponding capacity at their coal plants. In the meantime, as some modern coal plants come online, implement carbon capture and storage technologies to reduce their environmental impact. In the spirit of doing what is right, institutional investors have the muscle to lobby with their respective tax authorities to enable a one-time accelerated depreciation to zero to enable the expedited deployment of the windfall returns into renewable energy development. Additionally, all carbon capture and storage technologies should also be allowed to access the accelerated depreciation schedule.

*Option 2 – The Middle Ground:* As institutional investors exit their coal-related investments, their sale and purchase agreements should include covenants that cap the growth of capacity or a structured wind-down and disposal process. The absence of any such announcement only leads one to conclude that no such conditions were part of the transaction. Once such a transaction closes with these covenants, the respective investor should share this model to serve as a reference for others.

*Option 3- The Weak “Kick the Can Down the Road”:* Pursuing this option, institutional investors sell off the assets to willing buyers and initiate their PR and marketing machine to raise awareness of their move to only invest in clean energy. Who are the willing buyers and what are their incentives? Again, in the absence of any covenants to the sale and purchase agreements, one can only suspect that the willing buyers have significant lobbying power to stay the current course and maintain profitability at the expense of the environment. Sadly, this is the path we see institutional investors take.

**Financial support.** COP-27 covered a range of important topics however one topic will come to music to the ears of those in the developing

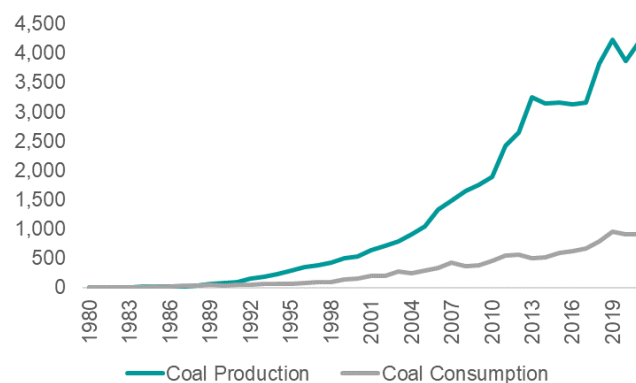
**Accountability  
and  
transparency  
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climate  
change action.**

countries – Financing. Specifically, financing to help developing countries tackle climate change and the energy/industry transition. For a long time now, we have seen mainstream media single out developing countries for their reliance on cheap energy at the expense of the environment. But there is little coverage of the emerging markets’ perspective whose counterargument that it is the developed economies that have caused the current climate emergency by driving growth without any regard for the environment. Furthermore, the consensus is for the developed world to support the emerging markets if they expect them to drive their economic growth using more costly sources of energy. This calls for a collaborative approach and while initiatives such as the Asian Development Bank’s Energy Transition Mechanism (ETM) and the Just Energy Transition Partnership (JETP) are steps in the right direction, more such programs are needed.

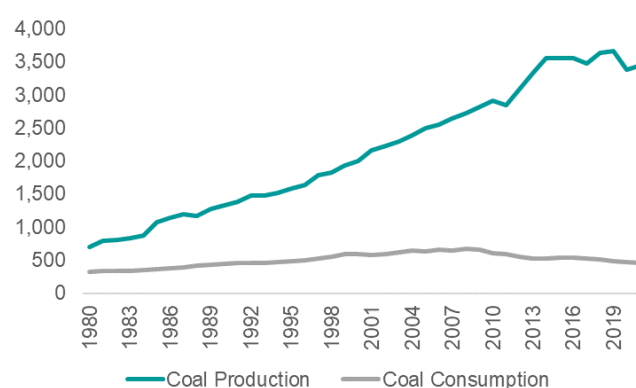
**Financial support to emerging countries is finally gaining traction.**

**Income substitution.** The commitment to reduce a nation’s dependence on coal paints a bleak outlook for coal-producing nations and should serve as an incentive to accelerate their transition. However, to accelerate the progress towards achieving Net Zero, existing coal-producing players need additional incentive to cease their income-generating coal-based activity. Indonesia and Australia are major coal producing nations such that the bulk of their production represents a significant national source of revenue from exports – see **Figures L and M**. Majority of these nations’ coal production are for exports to emerging countries such as China and India – growth economies that need to wean off coal with urgency. With the focus on minimising the use of coal, an alternative revenue stream needs to be developed for coal-producing nations to reduce the supply of coal.

**Figure L: Indonesia’s Coal Production and Consumption (in TWh); 1980 – 2021<sup>16</sup>**



**Figure M: Australia’s Coal Production and Consumption (in TWh); 1980 – 2021<sup>17</sup>**



### c. Policy: Climate Change Commitment Calls for Clear and Favorable Policies

**Incorporate the true cost of an energy’s source in any public policy.** It is long overdue that we account for the negative externalities associated with carbon-emitting activities. The same way an excise tax is applied to cigarettes for its undesirable effects, we no longer have the excuse to not tax pollutants because there are cleaner alternatives that have “attained” grid parity. The word attained is in quotations because there are certain human-imposed taxes and subsidies that currently dislocate the true economics of the different sources of energy. Levelling the playing field will work in favour of the renewable energy sector.

**Institute policies that enshrine a nation’s path to Net Zero.** The three main elements of any economic policy are stable prices, full employment, and economic growth. The outlook for fossil-fuel prices, employment of resources (both human and capital) in the

fossil-fuel-based industry, and sector's economic growth all look bleak. Effective policies are needed to transition nations to a state where the three elements paint a brighter picture. The current legislative uncertainty surrounding a nation's climate change strategy is a common stumbling block with the region for would be investors of renewable energy. See **Figure F** for the gaps in the policy frameworks of various countries. Take Vietnam as an example, the openness of its regulations enabled a sudden spike in solar panel installations that solar now represents a significant portion of its energy mix. However, new installations stalled due to the Feed-in Tariff uncertainty which the government has yet to clarify. While it is understandable for policy makes to steer away from long-term commitments, more consideration needs to be placed on investors' risk appetite and requirements to enable continued investment.

## 5. Conclusion

The world is largely on the right path however more is needed from the policy, regulatory and investor angles to accelerate the transition to Net Zero. For the ASEAN+ ANZ region to move the needle, extra effort should be deployed to the top 4 GHG emitting countries. Doing so will not only accomplish the climate change goals but also reposition the nations into a growth sector.

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<sup>1</sup> "Overview of Greenhouse Gases," US EPA.

<sup>2</sup> "Carbon Dioxide Emissions Coefficients," U.S. Energy Information Administration, release date: October 5, 2022.

<sup>3</sup> MJ = 106 Joule; "Heat Values of Various Fuels," World Nuclear Association; "Coal utilisation in the cement and concrete industries," G. Schumacher, L. Juniper, in *The Coal Handbook: Towards Cleaner Production: Coal Utilisation*, 2013.

<sup>4</sup> IEA-EDGAR CO<sub>2</sub>, a component of the EDGAR (Emissions Database for Global Atmospheric Research) Community GHG database version 7.0 (2022) including or based on data from IEA (2021) Greenhouse Gas Emissions from Energy, [www.iea.org/statistics](http://www.iea.org/statistics), as modified by the Joint Research Centre.

<sup>5</sup> *Ibid.*

<sup>6</sup> *Ibid.*

<sup>7</sup> Our World in Data; Maddison Project Database 2020. Available at: <https://ourworldindata.org/grapher/co2-emissions-vs-gdp?stackMode=relative&time=1970..latest&country=KHM~IDN~LAO~MYS~MMR~PHL~SGP~THA~VNM~AUS~NZL>

<sup>8</sup> "Long-Term Strategy for Carbon Neutrality," Kingdom of Cambodia, December 2021, available at [https://unfccc.int/sites/default/files/resource/KHM\\_LTS\\_Dec2021.pdf](https://unfccc.int/sites/default/files/resource/KHM_LTS_Dec2021.pdf).

<sup>9</sup> Our World in Data; Maddison Project Database 2020. Available at: <https://ourworldindata.org/grapher/co2-emissions-vs-gdp?stackMode=relative&time=2000..latest&country=ALB~AUT~BLR~BEL~BIH~BGR~HRV~CYP~CZE~DNK~EST~FIN~FRA~DEU~GRC~HUN~ISL~IRL~ITA~LVA~LTU~LUX~MLT~MDA~MNE~NLD~MKD~NOR~POL~PRT~ROU~RUS~SRB~SVN~ESP~SWE~CHE~UKR~GBR~SVK>

<sup>10</sup> Country UNFCCC submissions; Stainesbridge research.

<sup>11</sup> IEA-EDGAR CO<sub>2</sub>, a component of the EDGAR (Emissions Database for Global Atmospheric Research) Community GHG database version 7.0 (2022) including or based on data from IEA (2021) Greenhouse Gas Emissions from Energy, [www.iea.org/statistics](http://www.iea.org/statistics), as modified by the Joint Research Centre.

<sup>12</sup> *Ibid.*

<sup>13</sup> *Ibid.*

<sup>14</sup> *Ibid.*

<sup>15</sup> Kaplan, Robert S. and Karthik Ramanna, "Accounting for Climate Change," "HBR's 10 Must Reads 2023," Harvard Business School Publishing Corporation, 2022.

<sup>16</sup> Our World in Data: BP Statistical Review of World Energy; The Shift Dataportal.

<sup>17</sup> *Ibid.*