BRIEFING NOTE ON JAPAN'S POWER SECTOR AND NET ZERO

SUMMARY

- Japan's commitment to net-zero by 2050, announced by the former Prime Minister Yoshihide Suga and enshrined in Japanese law, has profound implications for the country's power sector.

- In common with countries elsewhere, the power and transportation sectors will account for over 2/3 of the emission reductions needed by 2030 to be in line with the net zero goal and Japan's revised NDC.

- The Inevitable Policy Response (IPR),[1] which is commissioned by PRI with economic modelling by Vivid Economics, provides global and country-level analyses, including on Japan, on how the national climate targets can be adequately achieved.

- Beyond PRI's own climate policy program, PRI participates in the Investor Agenda,[2] a mechanism for coordinating between seven different investor groups on climate change. Within the Investor Agenda, the Japan Country Policy Group, comprised of CDP and the Asian Institutional Investors Group on Climate Change (AIGCC), has recently sent a letter to current Prime Minister Kishida on the need for strengthened climate policy in fulfilment of Japan's net zero target.[3] This briefing note serves to supplement and further substantiate the policy asks of the letter for PRI signatories.

1. THE ROLE OF JAPAN'S POWER SECTOR AND NET ZERO

Decarbonising the power sector and electrifying other sectors of the economy are key tenants of a net-zero strategy. Figure 1 shows the emissions by sector in Japan, which indicates that power and transport sectors' dominant role in contributing to the country's overall greenhouse gas (GHG) emissions. This is similar to what is found

[1] The Inevitable Policy Response 2021 Policy Forecast: https://www.unpri.org/inevitable-policy-response/what-is-the-inevitable-policy-response/4787.article

[2] The Investor Agenda: https://theinvestoragenda.org/

[3] Investor Agenda letter Re: Call for decisive decarbonization action after COP26: https://theinvestoragenda.org/wp-content/uploads/2022/03/The-Investor-Agenda-Open-Letter-to-PM-0325.pdf

in other G20 countries. Indeed, decarbonising road transport also hinges on first eliminating emissions in the power sector.

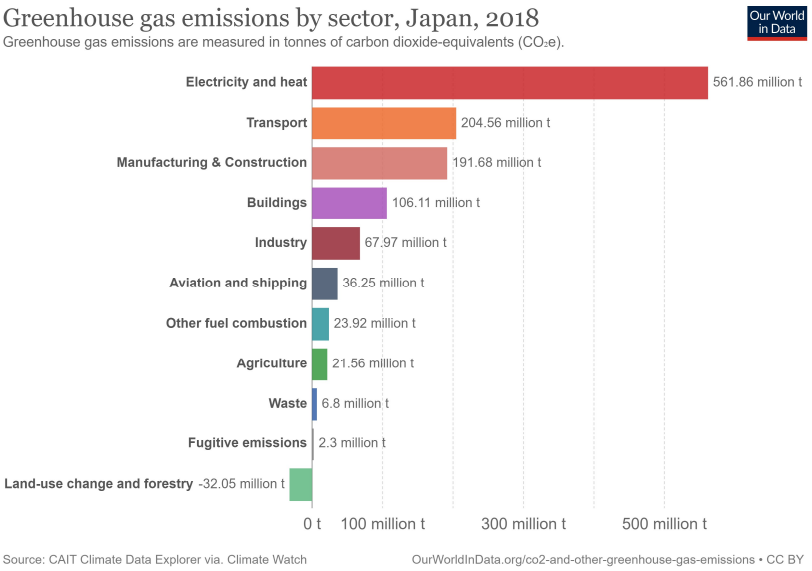

Figure 1 Greenhouse gas emissions by sector, Japan, 2018[4]

The International Energy Agency's *Net Zero by 2050* [5] report finds that all advanced economies, including Japan, should entirely decarbonise their power sectors by 2030. Vivid Economics, in work that has been commission by the PRI as part of the Inevitable Policy Response (IPR), found that the date could be slightly later, 2035, to be in line with a 1.5°C pathway (RPS – Required Policy Scenario). Or 2040 in a 1.8°C scenario (FPS – Forecast Policy Scenario).

100% clean power

	Timeline									annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	2060	RPS	FPS
AU					RPS		FPS			5%	3%
BRA					RPS		FPS			5%	3%
CAN			RPS	FPS						10%	7%
CHI					RPS		FPS			5%	3%
CSA					RPS		FPS			5%	3%
EEU				RPS		FPS				7%	4%
EURA						RPS			FPS	4%	3%
GCC						RPS			FPS	4%	3%
IND						RPS			FPS	4%	3%
INDO						RPS			FPS	4%	3%
JAP				RPS		FPS				7%	4%
MENA						RPS			FPS	4%	3%
RU						RPS			FPS	4%	3%
SA						RPS			FPS	4%	3%
SAF				RPS	FPS					7%	5%
SEAO						RPS			FPS	4%	3%
SK				RPS		FPS				7%	4%
SSA						RPS			FPS	4%	3%
UK				RPS	FPS					7%	5%
USA				RPS	FPS					7%	5%
WEU				RPS		FPS				7%	4%

** reduction in power CO2 emissions as a share of 2020 levels*

Figure 2 Timelines for 100% clean energy in IPR modelling

The speed of the transition in the power sector, as well as the choice of generation technology, has been a matter of debate amongst policymakers in Tokyo. The

[4] Greenhouse gas emissions by sector, Japan, 2018: https://ourworldindata.org/co2/country/japan

[5] IEA Net Zero by 2050 report (May 2021): https://www.iea.org/reports/net-zero-by-2050

Ministry of Economy, Trade and Industry (METI), and its key adviser, the Research Institute of Innovative Technology of the Earth (RITE), favour an approach which would retain a significant role for coal power generation.[6] This is a point of continuing discussion both between ministries in Japan and internationally.

2. THE COMPATIBILITY OF ENERGY SECURITY AND CLIMATE POLICY OBJECTIVES

The need to balance energy security concerns with short-to-long-term climate policy objectives is of great importance, particularly under the context of the ongoing global energy crisis. As further detailed in the below two sections, the deployment of renewables and nuclear power in Japan should take into account the risk of energy insecurity and its social implications on consumers, if the transition is not done thoughtfully and equitably.

In reconciling the tangible issue of energy security with wider climate considerations, it is equally important to note three key considerations:

- **Japan remains one of the few advanced economies to anticipate new and extended coal generation capacity**. Non-abated coal would offset gains from renewables and efficiency improvements and increase its (already high) carbon intensity to five-fold of what the Japanese grid needs to achieve by 2030 to meet the stated emission reduction targets.[7] It also risks locking in carbon-intensive infrastructure, which increases both financial and commercial risks associated with high-carbon assets and the cost of transition to a net-zero economy;

- **Japan's domestic capacity for carbon storage is limited**, and an indefinite use of coal-fired power means that Japan will need to export 20-30% of the power sector's *annual* emissions for storage in other countries; and

- **The use of carbon capture and storage (CCS) technologies and unabated coal will similarly bring their own security challenges**. The recent IPCC Working Group II report published in early March 2022 highlights that continued use of unabated coal is likely to put the future prosperity of economies, including Japan's, at risk and therefore not necessarily deliver a future that is more secure.[8]

3. RENEWABLE ENERGY DEPLOYMENT IN JAPAN

The energy mix target set in Japan's Sixth Strategic Energy Plan,[9] with an upward revision of renewables by 14% to 36-38% in the overall power output in fiscal 2030,

[6] RITE Scenario Analyses for 2050 Carbon Neutrality: https://www.rite.or.jp/system/en/global-warming-ouyou/download-data/E-202106analysisaddver.pdf

[7] IEA Japan 2021 Energy Policy Review: https://www.iea.org/reports/japan-2021

[8] IPCC Working Group II: Impacts, Adaptation and Vulnerability: https://www.ipcc.ch/working-group/wg2/

[9] Japan Sixth Strategic Energy Plan: https://www.meti.go.jp/english/press/2021/1022_002.html

is largely welcomed, as power contributes to around 47% of Japan's energy-related carbon emissions.[10]

Importantly, Japan's unique topography poses further challenges in scaling up solar and wind's low energy density given their large land requirement. Japan's regional utility companies' structure also presents challenges for power market reform.

In light of such challenges, achieving the 36-38% target would entail the Japanese government clarifying the policy mechanisms that would deliver on this target in eight years. **PRI recommends that these policies include**:

- **A rising price on carbon that covers power and industrial sectors with a target range of between $50-$100 per tonne of CO_2 by 2030;**[11]
- **Schedule a series of auctions for renewable energy to deliver the necessary levels of wind and solar PV capacity;**
- **A review the power market arrangements and remove impediments to the investment and generation of clean power**; and
- **Streamline permits of renewable projects to reduce barriers of economies of scale in renewable energy deployment and invest in high voltage transmission infrastructure across regions to connect renewable generation with demand centres.**

4. ROLE OF NUCLEAR IN JAPAN

As indicated under the Sixth Strategic Energy Plan, nuclear power will account for 20-22% of Japan's electricity mix in 2030. This was premised on the active promotion of nuclear restart, with public safety and trust as a top priority in the process.

However, research on the viability of the latest energy plan shows that shortcomings in meeting the nuclear power targets would risk surpassing the 19% of coal within the proposed energy mix. This is exacerbated by the absence of carbon pricing and other regulatory measures, which would maintain coal's nominally low-cost generation advantage over the energy options.

As such, PRI has called for the Japanese government **to publish a feasibility report on how they would decarbonise the power sector in line with the stated targets**. A reliable, actionable coal phaseout strategy is key in achieving Paris-aligned emission reduction goal.

5. PRI'S INVOLVEMENT IN THE INVESTOR AGENDA

[10] IEA Japan 2021 Energy Policy Review: https://www.iea.org/reports/japan-2021

[11] Carbon Pricing Leadership Coalition *Report of the High-Level Commission on Carbon Prices:* https://www.carbonpricingleadership.org/report-of-the-highlevel-commission-on-carbon-prices

PRI is one of the founding members of the Investor Agenda, alongside AIGCC, IGCC, IIGCC, Ceres, CDP, and UNEP-FI. This collaboration is a mechanism for enabling coordination between the seven investor initiatives on climate change, which is a valuable vehicle to amplify investor voices collectively and globally.

Policy advocacy is a core part of the Investor Agenda's work programme, which includes both broad global-level policy work, and in-depth engagement at a country/regional level, including in the EU, US, Japan, and Australia. Notable global-level policy advocacy work facilitated through the Investor Agenda includes the annual *Global Investor Statement to Governments on the Climate Crisis*, which was signed by 733 investors representing over USD $52 trillion in assets in 2021. [12]For an extensive list of Investor Agenda policy engagement, please visit: https://theinvestoragenda.org/focus-areas/policy-advocacy/

[12] The Investor Agenda *2021 Global Investor Statement to Governments on the Climate Crisis*: https://theinvestoragenda.org/wp-content/uploads/2021/09/2021-Global-Investor-Statement-to-Governments-on-the-Climate-Crisis.pdfv