

Quad Cooperation in Climate Change and launch of the Quad Climate Change Adaptation and Mitigation Package (Q-CHAMP)

1. Concept

On the occasion of Quad leaders meeting in Tokyo on May 24, 2022, Quad countries confirmed our determination to further advance practical cooperation in addressing climate change, steadfastly implementing the Paris Agreement and delivering the outcomes of COP26, building on our ongoing cooperation and progress since the last leaders' meeting.

Quad countries are continuing in our efforts to provide support for Indo-Pacific partners, considering their growing needs for pragmatic transition to a net-zero economy and society and enhancing resilience to the impacts of climate change. To meet these needs, Quad countries launch the **Quad Climate Change Adaptation and Mitigation Package (Q-CHAMP)** with the themes of mitigation and adaptation/resilience guided by the Climate Working Group's three pillars: climate ambition, clean energy, and adaptation/resilience. Q-CHAMP highlights our joint efforts in areas confirmed for cooperation at the Quad leaders' meetings in September 2021 and May 2022 respectively. To make our cooperation increasingly tangible, practical, and systematic, Quad countries are committed to expanding our relevant programs, initiatives, and measures, fully utilizing our experience thereunder, in support of climate action between our four countries as well as in the Indo-Pacific region. The Q-CHAMP also summarizes individual actions Quad countries are taking to deliver tangible and practical climate action between our four countries as well as in the Indo-Pacific region.

2. Contents

Q-CHAMP covers the following areas of cooperation:

<Mitigation>

- Action to decarbonize the shipping and port sectors through the Quad Shipping Taskforce, aiming for a shared green corridor framework building on each Quad country's input.
- Enhancing and accelerating the clean energy transition through knowledge sharing on clean hydrogen and clean ammonia, methane reduction in the natural gas sector, and Carbon Capture, Utilization, and Sequestration (CCUS) and Carbon Recycling.
- Supporting responsible and resilient supply chains for clean energy technology, including through exploring possibility of developing a plan to strengthen clean energy supply chains in the Indo-Pacific Region, and through support for the Sydney Energy Forum in July 2022.
- Launching the Quad Mission for Article 6 Implementation to enable participation in high integrity carbon markets and support capacity building in the region.
- Enhancing knowledge sharing on subnational climate actions and holding a workshop on HFC lifecycle management.

<Adaptation/Resilience>

- Advancing climate information services through the Climate and Information Service Taskforce, and disaster risk reduction, including disaster and climate resilient

infrastructure such as the efforts through the Coalition for Disaster Resilient Infrastructure (CDRI).

- Promoting climate-smart agriculture, including through the Agriculture Innovation Mission for Climate (AIM for Climate), to enhance research and development (R&D) and innovation with the expected co-benefits for mitigation and strengthened resilience.
- Enhancing ecosystem-based adaptation and resilience advanced by nature-based solutions, focusing on marine ecosystems including through the International Coral Reef Initiative.

Quad Cooperation under Q-CHAMP

<Mitigation>

Green Shipping and Ports under the Quad Shipping Taskforce

Recognizing the importance of pursuing decarbonization efforts in shipping and port sectors, Quad countries welcome progress made since the launch of the Quad Shipping Task Force alongside four inaugural ports of ambition (Los Angeles, Mumbai Port Trust, Sydney (Botany) and Yokohama). Quad countries will continue to meet to exchange knowledge and best practices among Quad governments, ports and other stakeholders, discussing a shared framework to facilitate the establishment of 'green shipping corridors' by 2025-2030, aiming for a shared green corridor framework building on each Quad country's input. Taking note of the U.S. proposal to hold a Quad Transport Ministerial meeting, Quad countries will continue discussions in the Quad Shipping Task Force, to provide actionable policy recommendations to reduce greenhouse gas emissions across the shipping value chain and advance green shipping corridors between Quad countries.

Clean Hydrogen and Ammonia

Recognizing the importance of clean hydrogen and clean ammonia as zero-emission fuels, Quad countries will promote efforts to construct clean hydrogen and clean ammonia supply chains under the expanded 'Clean Hydrogen and Ammonia Partnership.' Quad countries welcome that, as part of this cooperation, Japan will host both the 'International Workshop on Economic Aspects of Hydrogen Supply Chain' in Kyoto in December and the 'International Workshop on Value Chain Construction of Ammonia' also to be held in the second half of this year, and that India will establish the 'Quad Clean Hydrogen Strategic Initiative,' under which the first activity would be the convening of a Quad Workshop on Hydrogen Regulations, Codes and Standards in July. Quad countries also welcome Australia's undertaking of an Indo-Pacific clean hydrogen supply chain study, which will map current supply chain capabilities and the optimal approaches needed to capture clean hydrogen supply chain opportunities across the region.

Methane Reduction in the Natural Gas Sector

Quad countries note that reducing methane emissions in the natural gas sector has climate, economic and energy security co-benefits. As important stakeholders in the natural gas market, including LNG, Quad countries have been developing best practices for methane reduction and the accurate measurement, reporting, and verification (MRV) of methane emissions in natural gas sector. From this point of view, Quad countries will convene an annual roundtable in rotation of Quad countries to share best practices and to encourage action taking into account our climate goals and domestic situations. This will include efforts to improve the MRV of greenhouse gas emissions throughout the entire LNG value chain.

CCUS/Carbon Recycling

Quad countries support the deployment of CCUS in the Indo-Pacific region through activities of the Asia CCUS Network, while recognizing CCUS/Carbon Recycling as key technologies to realize carbon neutrality.

Clean Energy Supply Chain

The development of diverse and robust supply chains for clean energy technology will be critical in facilitating the Indo-Pacific's transition to clean energy. Quad countries are exploring the possibility of developing a Clean Energy Supply Chain Plan to support responsible and resilient supply chains. Quad countries further welcome Australia and the IEA co-hosting the Sydney Energy Forum on 12-13 July 2022 to accelerate the clean energy transition underway across the Indo-Pacific. Quad Energy Ministers seek to meet on the margins of the Sydney Energy Forum in July to advance and build on all of the initiatives under the Clean Energy Pillar of the Quad Climate Working Group.

Supporting Capacity Building for Implementation of Article 6 of the Paris Agreement

Quad countries recognize the importance of high integrity carbon markets as a means of emission reduction and sustainable development in the Indo-Pacific region. Welcoming the completion of the Paris Rulebook at COP26 in Glasgow, Quad countries will launch the Quad Mission for Article 6 Implementation with the aim of supporting development in the region of transparent carbon markets with robust governance arrangements to deliver credible approaches to verified emissions reductions and removals with environmental integrity aligned with the Paris Agreement goals. Under this mission, Quad governments will develop and share best practices and methods, including for market development and oversight, authorization of mitigation outcomes, corresponding adjustments, reporting under the Paris Agreement transparency framework, and support and implement capacity building for Indo-Pacific countries. The mission can consider building upon the experience of existing initiatives such as:

- ✧ Australia's Indo-Pacific Carbon Offset Scheme (IPCOS).
- ✧ Japan's Joint Crediting Mechanism (JCM).
- ✧ LEAF Coalition.
- ✧ Forest Carbon Partnership Facility.
- ✧ BioCarbon Fund Initiative for Sustainable Forest Landscapes.

Knowledge Sharing on Subnational Climate Actions

Quad countries acknowledge the significant role of subnational entities (e.g. states and cities) in the effort toward net-zero. In collaboration with other international frameworks and networks such as C40 and the International Council for Local Environmental Initiatives (ICLEI), Quad countries will establish **Quad Workshop on Subnational Climate Action** to encourage information sharing, provide an opportunity for subnational entities to learn from each other and to facilitate options for city-to-city collaboration by utilizing the following frameworks, as necessary:

- ✧ Zero Carbon City International Forum (a series of conferences, including the Forum in 2022 co-hosted by Japan and the United States).
- ✧ Global Subnational Zero Carbon Promotion Initiative (a bilateral initiative by Japan and the United States).

Knowledge Sharing on Reducing Hydrofluorocarbons (HFCs) Emissions

Quad countries will share expertise on reducing fluorocarbon emissions. Quad countries will organize a **HFC Lifecycle Management Workshop**. This will be an event to help develop capacity of the Indo-Pacific countries to reduce fluorocarbons emissions by exchanging knowledge and good practices of existing initiatives including:

- ✧ Initiative on Fluorocarbons Life Cycle Management (IFL) (launched at COP25 by Japan).

<Adaptation/Resilience>

Critical Climate Information-Sharing Including the Climate and Information Service Task Force

Acknowledging the importance of climate information services and early warning systems in the Indo-Pacific region, especially for floods, droughts and heat waves, Quad countries held the initial meeting to exchange knowledge under the Climate and Information Service Task Force in April 2022. For the next step, Quad countries will hold a task force event on the occasion of the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR), slated in September 2022 in Brisbane, Australia, which will present an opportunity for Quad country representatives to engage with Indo-Pacific participants to share knowledge and gauge user needs across the region. Collaboration in this area will be driven by the needs of the Indo-Pacific, such as those documented in the Weather Ready Pacific proposal endorsed by Pacific leaders at the 2021 Pacific Island Forum Leaders' Meeting, and can utilize knowledge and experience of the existing individual measures and platforms such as:

- ✧ SERVIR and NASA-USAID partnership: A joint initiative between the United States and leading geospatial organizations in Asia, Africa, and Latin America.
- ✧ Japan's Asia-Pacific Climate Change Adaptation Information Platform (AP-Plat): Platform to support decision-making by taking the risks of climate change into consideration and highly effective climate change adaptation in the Asia-Pacific region.
- ✧ Australia's Climate and Oceans Support Program in the Pacific (COSPPac).

Disaster Risk Reduction including Disaster and Climate-Resilient Infrastructure

Quad countries will work together to promote cooperation in disaster risk reduction against extreme weather events, including through the Coalition for Disaster Resilient Infrastructure (CDRI) and its Infrastructure for Resilient Island States (IRIS) launched at COP26. Quad countries participated in the successful convening of a joint session, entitled “Regional Cooperation for Strengthening the Resilience of Infrastructure Systems and Communities in the Indo-Pacific” at the International Conference for Disaster Resilient Infrastructure in May 2022. Building on this progress, Quad countries will bring together and share our experience and practices for climate-related disaster risk reduction, including in sight of a possible opportunity to launch a program strategy of IRIS with Pacific Islands at APMCDRR.

Climate-Smart Agriculture

Recognizing the significant role of the agricultural sector in overall climate action and taking note of the particular importance of its adaptation aspect, Quad countries will explore opportunities to advance R&D and enhance innovation in climate-smart and resilient agriculture. Quad countries will implement cooperative activities through international initiatives such as the AIM for Climate, etc.; explore opportunities and options to conduct international joint research projects on climate-smart agriculture innovation as regional and bilateral cooperation; and deploy the results of research in other Indo-Pacific countries.

Ecosystem-based Adaptation and Resilience Focusing on Marine Ecosystems Advanced by Nature-based Solutions

Quad partners will enhance collaboration to conserve critical seascapes, especially coastal marine ecosystems such as coral reefs and mangroves in the Indo-Pacific region, taking the value of their critical ecosystem services that mitigate the impacts of waves, storm surges, and sea level rise. Moreover, Quad countries also will help limit coastal erosion and support sustainable fisheries critical for food security, economic growth, and livelihoods. These ecosystems can provide developing countries, including Pacific island countries, in particular, with the opportunity to be net carbon positive, by working with the private sector to improve the management and value of natural capital. Quad countries will work together through the scientific and technical cooperation under International Coral Reef Initiative or any other planned or existing projects.

Annex:
Relevant Programs, Initiatives and Measures by Quad Countries

In addition to and enhancing the work of the Q-CHAMP, Quad countries, both individually and collectively, are delivering programs, initiatives, and measures in the Indo-Pacific that are advancing mitigation and adaptation, some of which are listed in this Annex.

<Mitigation>

Enhancing clean energy transition

- ❖ Quad countries are discussing cooperation of clean energy innovation and deployment under the following governmental arrangements and/or policy dialogues:
 - Letter of Intent between India and Australia on New and Renewable Energy Technology.
 - Japan-Australia Partnership on Decarbonization through Technology.
 - Australia-Japan Memorandum of Cooperation on Carbon Recycling.
 - India-Japan Clean Energy Partnership.
 - Japan-United States Clean Energy and Energy Security Initiative.
 - Memorandum of Cooperation Between The Ministry of Economy, Trade and Industry of JAPAN and The Department of Energy of The UNITED STATES OF AMERICA Concerning Collaboration in The Field of Carbon Capture, Utilization and Storage / Conversion and Recycling, and Carbon Dioxide Removal.
- ❖ Ongoing tangible projects within Quad countries:
 - Feasibility study on establishing a clean fuel ammonia supply chain from Australia to Japan (Woodside Energy Ltd. at Australian side and Japan Oil, Gas and Metals National Corporation (JOGMEC), Marubeni Corporation, Hokuriku Electric Power Company and The Kansai Electric Power Co., Inc. at Japanese side).
 - Joint feasibility study on CCS for creation of a supply chain of low carbon ammonia in Western Australia (Mitsui E&P Australia Pty Ltd (MEPAU) at Australian side and JOGMEC at Japanese side).
 - Hydrogen Energy Supply Chain (HESC) Pilot Project¹ which is the first project in the world to make and transport liquid hydrogen between two countries by sea (supported by Australian and Japanese Governments, the Victorian (State) Government and industry).
 - Australian Clean Hydrogen Trade Program (ACHTP). The first round of the Program will focus on the export of clean hydrogen to Japan under the [Japan-Australia](#)

¹ HESC Pilot Project is jointly carried out by HySTRA (CO2-free Hydrogen Energy Supply-chain Technology Research Association) and an Australian-side consortium consisting of Kawasaki Heavy Industries, Ltd, Electric Power Development Co., Ltd., Iwatani Corporation, Marubeni Corporation, AGL Energy and Sumitomo Corporation in Australian portion. HySTRA includes Iwatani Corporation, Kawasaki Heavy Industries, Ltd, Shell Japan. Ltd., Electric Power Development Co., Ltd., Marubeni Corporation, ENEOS Corporation and Kawasaki Kisen Kaisha, Ltd. in Japanese side

Partnership on Decarbonisation through Technology (mentioned above).

- Long-term implementation demonstration project for the local production for local consumption of hydrogen at the port of Los Angeles in the United States (Toyota Tsusho Corporation, Toyota Tsusho America Inc., Mitsui E&S Machinery Co. Ltd., PACECO CORP., Hino Motors, Ltd., and Hino Motor Manufacturing U.S.A., Inc., with the support of New Energy and Industrial Technology Development Organization (NEDO) of Japan).
- Survey on dissemination of hydrogen technology in India (Japan External Trade Organization (JETRO), New Energy and Industrial Technology Development Organization (NEDO) and other stakes).
- Study on dissemination of fuel ammonia combustion technology in India (New Energy and Industrial Technology Development Organization (NEDO)).
- Study on optical fiber monitoring at CCS site (Research Institute of Innovative Technology for the Earth of Japan, Energy and Environmental Research Center of University of North Dakota in the United States, and CSIRO and CO2CRC in Australia with the support of NEDO).

Supporting Capacity Building for Implementation of Article 6 of the Paris Agreement

- ✧ Australia's Indo-Pacific Carbon Offset Scheme (IPCOS): In 2021 the Australian Government committed \$104 million over 10 years to develop an Indo-Pacific Carbon Offsets Scheme (IPCOS). IPCOS will boost public and private investment in climate action and practical projects, to generate a scalable supply of high-quality carbon offsets and enhance the ability of partners in the Indo-Pacific to meet and report against their Nationally Determined Contributions. The Australian Government has welcomed Fiji and Papua New Guinea as the first international partners to join IPCOS.
- ✧ Japan's Joint Crediting Mechanism (JCM): The JCM is implemented 1) To quantitatively evaluate contributions of Japan to GHG emission reductions and removals which are achieved through the diffusion of, among others, by leading decarbonizing technologies, products, systems, services, and infrastructure as well as through implementation of measures in developing countries and others, using such contributions to achieve Japan's NDC and for other purposes; and 2) To contribute to the ultimate objective of the United Nations Framework Convention on Climate Change and the objective of the Paris Agreement by facilitating global actions for GHG emission reductions and removals.

Knowledge Sharing on Subnational Climate Actions

- ✧ Zero Carbon City International Forum (a series of conferences, including the Forum in 2022 co-hosted by Japan and the United States).
- ✧ Global Subnational Zero Carbon Promotion Initiative (a bilateral initiative by Japan and the United States).

Knowledge Sharing on Reducing Hydrofluorocarbons (HFCs) Emissions

- ✧ Initiative on Fluorocarbons Life Cycle Management (IFL) (launched at COP25 by Japan).

<Adaptation/Resilience>

Critical Climate Information-Sharing Including Climate and Information Service Taskforce

- ✧ Australia's Climate and Oceans Support Program in the Pacific (COSPPac) Design of the next phase may integrate aspects of the Weather Ready Pacific program proposal, which has Pacific Island Forum leaders' support.
- ✧ Through the \$23 million Climate and Oceans Support Program in the Pacific, Australia's Bureau of Meteorology supports 14 Pacific country counterparts to prepare for climate extremes and communicate seasonal forecasts, and provide information on sea level rise, tide and wave data for shipping and fishing.
- ✧ Australia will host the UNFCCC Standing Committee on Finance (SCF) in September 2022, providing an opportunity to support increased public and private sector finance for climate change mitigation and adaptation through Nature-based Solutions, aligning with the UNFCCC Cancun Agreement.
- ✧ Japan's Asia-Pacific Climate Change Adaptation Information Platform (AP-Plat)
- ✧ Japan International Cooperation Agency (JICA) provides capacity building for meteorological observation, forecasting, and warning.
- ✧ Japan contributes to capacity building on Climate Resilience in the Pacific such as JICA's support for the construction of the Pacific Climate Change Center as a training facility under the Secretariat of the Pacific Regional Environment Programme (SPREP), a regional organization headquartered in Samoa.

Disaster Risk Reduction including Disaster and Climate-Resilient Infrastructure

- ✧ The Australian Humanitarian Partnership's Disaster READY program (\$90 million, 2018-2027) is supporting over 100 communities in four Pacific island countries to prepare for, and reduce the risk of disasters.
- ✧ Australia's Women's Resilience to Disasters Program (\$13.5 million) in the Pacific empowers women in Fiji, Kiribati and Vanuatu to lead Pacific solutions to disaster prevention, preparedness and recovery.
- ✧ Australia will host the Asia-Pacific Ministerial Conference on Disaster Risk Reduction in Brisbane (19-22 September 2022) convened by the United Nations Office for Disaster Risk Reduction, providing an important opportunity to review risk reduction and adaptation efforts, share and learn about innovative and practical solutions, and for countries and organizations to make actionable commitments against the Sendai Framework.
- ✧ Australia's \$9.5 million nature-based solutions program, Climate Resilient by Nature, works with local communities to conserve and restore natural ecosystems in the Pacific and Southeast Asia – reducing emissions and benefiting communities through improved livelihoods, and disaster risk reduction.
- ✧ Australia is providing sustainable sanitation and hygiene in Lao PDR by funding Beyond the Finish Line through the Water for Women program. The program is building local government capacity to integrate climate resilience into WASH for an estimated 229,000

people in Lao PDR.

- ✧ Australia has launched a new six-year disaster and climate resilience initiative – Strengthening Institutions and Empowering Localities against Disasters and Climate Change to increase local governments’ institutional and community resilience to the frequent natural hazards and climate change risks in the Philippines.
- ✧ Australia has deployed 115 experts to 22 partner countries since 2017 to help prepare for disasters. Australia Assists is helping disaster management authorities, NGOs, UN organizations and regional bodies across the world prepare better systems for responding to the increasing frequency, intensity and complexity of disasters.
- ✧ At the Third UN World Conference on Disaster Risk Reduction that Japan hosted in March 2015, Japan launched the “Sendai Cooperation Initiative for Disaster Risk Reduction” and committed to provide 4 billion USD in total and train 40 thousand government officials and local leaders in the four years from 2015 to 2018. Building on the successful completion of the initiative, Japan continues to play a leading role in this field through the “Sendai Cooperation Initiative for Disaster Risk Reduction Phase 2,” under which Japan will provide assistance for at least 5 million people and provide training for 85,000 people on disaster risk reduction from 2019 to 2022, in order to increase resilience to disasters in the Asia-Pacific and other regions.
- ✧ Furthermore, at the Fourth Asia-Pacific Water Summit that Japan hosted in April 2022, PM Kishida announced the “Kumamoto Initiative for Water,” under which Japan committed to provide financial assistance worth approximately 500 billion yen over the next five years for the solution of water-related social issues including climate change adaptation and water-related disaster risk reduction.
- ✧ Through these initiatives, Japan proactively contributes to disaster risk reduction and relevant efforts in the Indo-Pacific including the following cooperation projects among others:
 - The Philippine government has been implementing a series of measures in the Passig-Marikina River basin, including the Mangahan Spillway, revetment, dredging, and levee improvement. The river runs through the highly urbanized administrative and economic center of Metro Manila, and past floods have had a tremendous economic and social impact throughout the country due to inundation. Japan continues to support the implementation of river improvement and spillway construction projects through the formulation of master plans and yen loans.
 - Japan has been cooperating with developing countries for more than 30 years to strengthen their meteorological observation and forecasting capacity. In cooperation with the Japan Meteorological Agency, JICA has provided technical assistance for the development of meteorological radars and capacity building of meteorological agencies in countries such as the Philippines, Myanmar, Mongolia, Pakistan, Sri Lanka, and Mauritius.
- ✧ Japan’s Majuro Atoll Reservoir Development Plan will begin for the Marshall Islands to prepare for the drought caused by changes in rainfall patterns due to future climate change, under which a new reservoir with a capacity of 57,000 m³ will be constructed.

- ✧ Japan has supported risk assessment of inundation hazards using remote sensing technology in coastal areas and several airports of SIDS (e.g. the Independent State of Samoa and the Federated States of Micronesia) since 2017. Japan also will support the implementation of NbS / Eco-DRR adaptation projects in SIDS that best combine of Gray and Green measures with scientific knowledge on heat stress tolerant corals, and access to climate finance.

Climate-Smart Agriculture

- ✧ Japan provides support to Indonesia under JICA's "the Project of Capacity Development for the Implementation of Agricultural Insurance" to protect farmers from the diverse risks of crop failure.

Other relevant programs, initiatives and measures

- ✧ Australia-Singapore Initiative on Low Emissions Technologies for Maritime and Port Operations
- ✧ Australia-Republic of Korea Low and Zero Emissions Technology Partnership
- ✧ In 2021 the Prime Minister of Australia and the Prime Minister of Singapore also agreed to explore a bilateral Green Economy Agreement (GEA). The GEA will seek to facilitate trade and investment in environmental goods and services, strengthen environmental governance, and contribute efforts to build global capacity to address climate change.
- ✧ The \$2 billion Australian Infrastructure Financing Facility for the Pacific is financing the delivery of renewable energy to the Solomon Islands through the Tina River Transmission Line, which will strengthen energy security, reduce the country's exposure to volatile global fuel prices and enable Solomon Islands to meet 100 per cent of its Paris emissions reduction target.
- ✧ Australia's \$140 million Australian Climate Finance Partnership will mobilize private finance to reduce emissions and build resilience through investments across Southeast Asia and the Pacific.
- ✧ Australia is providing sustainable sanitation and hygiene in Lao PDR by funding Beyond the Finish Line through the Water for Women program. The program is building local government capacity to integrate climate resilience into WASH for an estimated 229,000 people in Lao PDR.
- ✧ Australia's SciTech4Climate initiative will bring leading Australian scientists and climate specialists (CSIRO and ANU) to work together with development partners in the Indo-Pacific to make sure our region's response to climate change is supported by the best available science and technological advances.
- ✧ The Weather Ready Pacific program is a Pacific-designed strategic roadmap for enabling Pacific small island developing states to better anticipate, prepare for and respond to the risks of more intense and/or frequent severe weather events due to climate change. The Weather Ready Pacific proposal was endorsed by Pacific leaders at the 2021 Pacific Island Forum Meeting.
- ✧ Japan signed ASEAN-Japan Climate Change Action Agenda 2.0.