

UN CTCN Partnership and Liaison Office 2026 Regional Capacity Building Program: Asia

Summary Note

Integrating Energy Technologies

Date & Venue: 8-9 July 2026, Pattaya, Thailand

Hosting country: Thailand, Office of National Higher Education Science Research and Innovation Policy Council, Ministry of Higher Education, Science, Research and Innovation

Partnered organization: Green Climate Fund

Background and purpose: The year 2026 marks the fourth year of CTCN's 3rd Programme of Work (PoW), which places increased emphasis on moving from discrete technology support toward integrated, system-level transformation pathways. This direction takes into consideration COP/CMA decisions, including the AI4ClimateAction 2024-2027 workplan and the Belém Technology Implementation Programme, which emphasizes demand-driven implementation, capacity building, and a more complete technology cycle to support deployment and diffusion.

CTCN's 2026 Capacity Building Programme in Asia focused on system transformation, understood as coordinated change across technologies, institutions, and decision-making processes to deliver lasting climate impact. Feedback from the 2025 thematic programmes on Climate Finance and Co-creation reinforces the need to move beyond the status quo, to improve livelihoods, and to measure progress. Together, these perspectives underscore that impact is understood by NDEs as a system-level outcome, achieved when capacity building enables coordinated change across interconnected layers.

Analysis of NDCs, TNAs, and TAPs shows that Asian countries prioritize technologies in agriculture including crop diversification, improved varieties, and rooftop rainwater harvesting and energy, particularly energy efficiency in transport, power generation, optimal energy consumption in plantations, and grid-connected solar energy. These priorities indicate readiness for system transformation through integration, as technologies are increasingly linked to existing production, energy, and planning systems rather than deployed in isolation. Notably, three countries² explicitly reference plans to apply AI-related technologies for mitigation and adaptation, signaling emerging institutional readiness to move from automation toward data-driven and adaptive system management.

The 2026 workshop built on this evolution by focusing on Integrating Energy Technologies. The curated sessions informed frameworks and concepts supporting in integrating emerging and proven energy technologies at a national and a regional level, as well as learn lessons from selected project cases. The overall objective of this programme was to enhance knowledge on integrating energy systems through Artificial Intelligence.

Participants: 28 NDEs and NDAs representing 17 countries participated. The program engaged 12 CTC prospective and current Network Members (NMs). This meeting included the participation of 25 women, and 44 men. The full list of participants available in Annex I and a group photo in Annex II.

Approaches and activities: Centring system-thinking and multi-stakeholder engagement, three key activities were planned to achieve the following objectives:

1. **Enhance understanding on integrating energy systems and** key actors, including international, regional, and national public and private sector climate technology providers.
2. **Strengthen NDEs' ability to link climate technologies with financing mechanisms**, using real-world case studies and interactive project design exercises.
3. **Build capacity to position technical assistance (TA) requests**, in a large climate project

A five-step co-creation process was applied using three sequential methods: information distribution, field visit, and participatory. Detailed steps taken are available from page 3 onwards.

In summary, the sequential activities of this capacity building programme suggest below top 3 TM-FM linkage project ideas:

- **Solar-to-Grid Accelerator** addressing a mature technology blocked mainly by market and infrastructure conditions.
- **Hydropower Platform** addressing a mature technology requiring integrated climate, water, safeguard and financing decisions.
- **Maldives Demonstrator** addressing an emerging technology requiring public risk-bearing finance before commercial investment can participate.

Methodology: 5-step co-creation process

Table 1 illustrates all sub-activities and expected outputs of the process undertaken.

Table 1

Process	Methods Applied	Program Activities	Output(s)	
1. Planning	Co-creating scalable climate technology TA projects	Segmentation	Identification of potential groups with similar sectoral/technological needs and emerging technologies from the region	
2. Sensitizing		Information distribution	Site visit	Understanding private sector's system transformation vision and activities
3. Facilitating			Plenary session	Understanding international and public sector's energy system integration status and related projects
4. Engaging		Participatory sessions	10 networking booths	Direct matchmaking between NMs and NDEs and NDAs to facilitate exchange of mutual learning on available solution and country-specific priorities.
			Technology discussion	Review TEC-approved emerging energy technologies and exchange bottlenecks and innovation points
			Finance discussion	Exploring possible project-level activities, actors to involve, financing instruments to select to deploy chosen emerging technology
5. Analyzing		Evaluation	Post-program engagement	Analyses of insights gathered from NDEs and NDAs and follow-up on the bilateral results

Step 1. Planning: In this step, CTCN reviewed, analysed and synthesised participating countries' NDC, Technology Needs Assessments (TNA) and Technology Action Plans (TAP) and searched energy-related national policy and projects under developing/implementation. Also, CTCN conducted review on NMs from

the region to understand the level of readiness for scalable TA implementation. For the participatory sessions, slides, a Workbook¹, coloured papers, pens, sticky notes, workshop boards, and stickers were prepared.

Segmenting NDEs by climate priorities

21 country cards (Annex III) were populated to inform potential grouping as below.

Table 2 Groups for participatory sessions

Group	Countries	Common ambition and vision
A	Pakistan, Sri Lanka, Bangladesh, Indonesia, Cambodia	Energy systems integration
B	Philippines, Kazakhstan, Kyrgyzstan, Bhutan, India	Energy technology deployment
C	Malaysia, Vietnam, Thailand, Uzbekistan, Maldives,	Energy transition
D	Tajikistan, Lao PDR, Mongolia, Turkmenistan, Nepal	Energy transition

With this possible grouping in mind, five sequential sessions were developed within the program to ensure the relevance and alignment of the identified needs with current national priorities, challenges, and evolving sectoral contexts.

Identifying matchable regional NMs The invitation process was conducted in few stages to ensure both thematic relevance and broad participation. An initial targeted outreach was undertaken to NMs with expertise in energy and AI, accompanied by an Expression of Interest (EOI) form requesting information on NM's motivation, relevant energy-related projects, and previous engagement with the CTCN. In parallel, the Government of Thailand was invited to nominate up to three national organizations. The invitation and EOI form were subsequently shared with the wider CTC Network, resulting in nine EOI submissions overall. Based on the responses received, 10 NMs and prospective organizations were selected considering thematic relevance, regional representation, and potential value for participating NDEs. To support effective matchmaking, an information package with profiles of the selected NMs was shared with participating NDEs and NDAs one week before the event.

Step 2. Sensitizing: Technical Site Visit to Thai Eastern Group Holdings (TEGH)

Unlike previous capacity-building programmes, the programme began with a field visit to a private sector company, allowing NDEs to ground the subsequent discussions in a practical example of integrated climate technology deployment.

The visit comprised four learning components: a presentation by New Energy Nexus on the evolving architecture of Asia's energy system; an overview of TEGH's business model and organic waste and biogas technologies; an R&D and sustainable technology showcase focused on the rubber industry; and a visit to the Khaosok Valley Model in the Eastern Economic Corridor, showcasing an evolution of private sector's corporate social responsibility into community-based system development.

¹ https://www.ctc-n.org/sites/default/files/2026-07/Asia_Workbook_Day%202-4.pdf



Figure 1 Site visit

Three key messages emerging from the visit were as follows:

1) The urgency of integration

The time for integrated approaches has arrived. Addressing current climate and development challenges requires innovation not only in technology, but also in business models, financing arrangements and partnerships. NDEs also observed that technologies are increasingly diverging into market-ready solutions and those that remain dependent on further innovation, requiring differentiated forms of support.

2) Market transformation is already underway

The private sector is moving beyond competition based primarily on product quality towards the development of sustainable, low-carbon value chains in response to changing customer and market expectations. TEGH demonstrated how this integration is already occurring in practice, including through the conversion of rubber- and palm-oil-related residues into biogas and electricity.

3) Policy frameworks must keep pace with market change

Regulatory frameworks have not always evolved at the same pace as private-sector transformation. Clear and predictable policies are therefore needed to reduce investment uncertainty and maintain economic competitiveness. Governments have an important role in enabling system-level integration, including through grid stability, coordinated infrastructure and policy frameworks that allow businesses to move beyond individual circular-economy practices towards integrated low-carbon industrial ecosystems.

Step 3 Facilitating: Plenary Session 1 and reflection on the system transformation

Plenary Session: International and Public-Sector Perspectives on Energy-System Integration

From 2nd day of the programme, following the field visits arranged for NDEs on the 1st day, NDAs began joining the programme for examining the current status of energy-system integration and related public-sector

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projects. The session connected the private-sector practices observed at TEGH with international financing, policy and technical-assistance pathways.

The UNEP's GEF presentation highlighted that Asia's energy transition² is moving beyond the addition of renewable generation towards a whole-system delivery challenge. Energy efficiency, demand management, grids, storage, utility reform, financing and institutional capacity must advance together for renewable energy to replace, rather than merely supplement, fossil-fuel generation. UNEP GEF projects support can contribute by strengthening the market-enabling layer, including policies, standards, data and monitoring systems, while preparing investment pipelines, reducing first-mover risks and mobilizing larger public and private financing.

Japan's NDE presented lessons from CTCN TA implemented by Japanese NMs, using the Mauritius Ocean Thermal Energy Conversion (OTEC) and deep-sea-water infrastructure project as an example³. The case illustrated a pathway from nationally identified needs through stakeholder engagement, technical and financial assessments, business-model development and preparation of a GCF concept note. The experience emphasized three lessons: begin with country priorities, build the investment case from the early stages of technical assistance, and establish a clear pathway towards climate finance and follow-up support.

Together, the presentations reinforced that energy-system integration requires coordinated packages combining technology, infrastructure, policy, finance and implementation capacity. They also provided a foundation for the subsequent NDE-NDA discussions on translating technology priorities into finance-ready project pipelines.

Facilitating Reflection on System Transformation

1-hour structured reflection exercise was facilitated to support participants in moving from general discussions on energy transition to a practical assessment of the actors, institutional failures and intervention points shaping renewable energy deployment in their countries. NDEs and NDAs used the accompanying workbook to record their individual reflections and consolidate the results of the group discussions.

1) Individual reflection

NDEs and NDAs first undertook five minutes of silent reflection on the question: "Who blocks renewable energy-related decisions in our country?". Using the stakeholder matrix in the workbook, they considered the level of power and support of relevant actors and classified them as strong or weak supporters or opponents. This supported participants in looking beyond technical barriers and identifying the institutions and stakeholders that influence whether energy-related decisions progress.

2) Identification of system failures

In a country or small groups, they identified specific policy, technological and regulatory failures affecting renewable energy deployment. Each failure was recorded separately on a sticky note to ensure that the issues remained specific and could be reviewed individually. The groups discussed whether each constraint was primarily a technology problem or instead related to factors such as approvals, tariffs, regulation, institutional mandates or coordination.

3) Mapping the scope for NDE and NDA intervention

For each identified failure, participants considered how far the NDE and NDA could intervene within the existing system. Blue and red dot stickers were used to indicate areas within the NDE's and NDA's respective spheres of influence. This process supported role clarification and visualized where joint NDE-NDA action, engagement with line ministries or intervention by other national actors would be required.

² https://www.ctc-n.org/sites/default/files/2026-07/Day%203_Session%201_1_Energy_Transition_Asia_UNEP%20GEF.pdf

³ https://www.ctc-n.org/sites/default/files/2026-07/Day%203_Session%201_2_OTEC%20TA.pdf



Figure 2 Step 3 activity - Reflection board example

4) Gallery walk and peer reflection

The completed group reflection boards were displayed for a silent gallery walk during the coffee break. NDEs, NDAs, and other stakeholders in the room reviewed the challenges and intervention points identified by other countries and added three types of feedback:

- a **heart** sticker where an issue resonated with their own country;
- a **star** sticker where they saw a potential intervention; and
- a **smile** sticker where they wished to explore the issue further.

The gallery walk enabled countries to compare recurring barriers, identify shared intervention opportunities and initiate peer-to-peer exchanges. Overall, the process reinforced that barriers to energy-system transformation are rarely technological alone; they are often shaped by stakeholder power, regulatory arrangements, institutional responsibilities and the ability of NDEs and NDAs to coordinate action across the wider system.

Step 4 Engaging: Matchmaking, and Technology and Finance Discussions

The Network Fair

Designed as a two-hour, structured matchmaking session connecting NDEs and NDAs with 10 NMs and invited organizations. Each organization hosted a dedicated table, beginning with a two-minute introduction to its expertise and technology solutions. NDEs and NDAs then moved freely between tables to discuss national priorities, technology needs, financing opportunities and potential areas for future collaboration.

Participants used the programme workbook to record key takeaways, level of interest and proposed follow-up actions from each interaction. This would support more focused exchanges and would enable both country representatives and participating organizations to identify concrete next steps, including technical meetings, sharing technical documentation, exploring pilot projects and maintaining engagement with relevant NDEs and NDAs.

The discussions focused on practical areas such as water security, non-revenue water reduction, grid modernization, renewable energy integration, energy-efficient infrastructure and institutional capacity building. Evaluation forms indicated medium to high levels of interest across most interactions, with follow-up

recommended for nearly all meetings. Participating organizations highlighted the value of the structured format and the quality of engagement with country representatives. The Network Fair included the following organizations:

Participated organizations from NMs and other invited organizations were:

1. mistEO Private Limited (India)
2. Climate Probity (US)
3. Zephyr Consulting (Netherlands) - WaveSave
4. Thai Eastern Bio Power Co., Ltd (Thailand)
5. Charoenchai Transformation Co., Ltd (Thailand)
6. PAC Corporation Co., Ltd (Thailand)
7. Globalyx (Sweden)
8. WI.Plat Co., Ltd. (South Korea)
9. New Energy Nexus (USA)
10. Asian Institute of Technology (Thailand)



Figure 3 Step 4 - The Network Fair

Technology Discussion - Selecting an emerging energy technology

Designed to support participants in moving from broad energy-system challenges to the practical requirements for deploying a specific emerging energy technology, drawing on the Technology Executive Committee brief⁴, NDEs and NDAs reviewed energy supply, storage, transmission and distribution technologies presented in the workbook, including their advantages, costs and limitations. NDEs and NDAs were seated separately throughout the session so that each group could examine the technologies from the perspective of its respective mandate and responsibilities.

⁴ <https://www.unido.org/sites/default/files/unido-publications/2025-11/Technologies%20for%20Climate%20Change%20Mitigation%20in%20Developing%20Countries%20-%20Renewable%20Energy.pdf>



Figure 4 Step 4 - Technology discussion

Sub-activity 1. Reflecting on technology deployment needs

For 10 minutes, participants undertook an individual silent reflection using the gaps and challenges identified during the earlier system-transformation exercise. NDEs considered what support would be required to overcome these barriers and what types of CTCN technical assistance could promote renewable energy deployment. NDAs reflected on how they could coordinate with NDEs and other national stakeholders to address the same barriers and enable implementation.

Sub-activity 2. Selecting one emerging energy technology

As part of the individual exercise, each participant selected one emerging energy technology for further consideration and recorded it in the workbook. Participants were encouraged to consider its relevance to national priorities, maturity, potential contribution to the energy transition and the policy, regulatory, financial, institutional and infrastructure conditions required for deployment. The selected technologies then provided a practical basis for the subsequent group discussions.



Figure 5 Step 4 - Technology discussion, exchanging NDE-NDA perspectives

Sub-activity 3. Comparing NDE and NDA perspectives on deployment

For 30 minutes, NDEs and NDAs discussed their selected technologies within their respective groups. NDE groups focused on the technical assistance, capacity development, policy support and stakeholder engagement required to enable deployment. NDA groups considered the coordination, project-preparation and financing arrangements needed to move the technologies towards implementation.

Representatives from each group were then invited to summarize their discussions in plenary. This enabled participants to compare how NDEs and NDAs approached the same deployment challenges and to identify areas in which their roles were complementary. Following the presentations, each participant reviewed the

group summaries, selected the one that resonated most closely with their national context and briefly recorded the reason in the workbook.

The discussion reinforced that selecting an appropriate technology is only the starting point. Successful deployment also depends on addressing the wider enabling environment and establishing early coordination between technology and finance focal points.

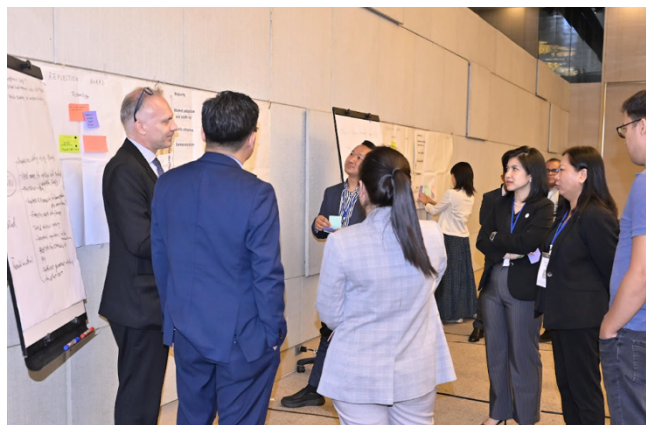


Figure 6 Step 4 - Finance Discussion

Financing Emerging Energy Technologies

Designed to support NDEs and NDAs together translate a selected technology priority into a realistic pathway towards implementation and scale-up. Thus, the session began with a GCF presentation on available financing transformative opportunities, and common barriers faced by developing countries in mobilizing climate finance. Participants recorded the key messages that captured their attention in the workbook before proceeding to the facilitated exercises.

Using the technology selected during Technology Discussion, NDEs and NDAs in a 5 mixed group setting, examined what project-level activities, financing instruments, institutions and sequencing required to move the technology from an identified need to an investable and implementable project.

Sub-activity 4. Matching technology activities with financing requirements

For 15 minutes, each group identified up to three priority activities required to advance its selected technology. These could include resource assessments, feasibility studies, policy or regulatory development, capacity building, business-model design, pilot demonstrations, investment preparation, grid-integration studies or market assessments.

The groups then matched these activities with a primary financing instrument, supporting instruments and an appropriate domestic or local financing modality. They also identified the institutions that would need to participate, including the NDE, NDA, relevant ministries, utilities, development banks, commercial banks, private-sector actors and local governments, and clarified the expected role of each institution. Finally, participants reflected on who should finance the earliest stage and whether grant support alone would be sufficient to move the technology forward.

Sub-activity 5. Sequencing the technology-to-finance pathway

For 20 minutes, participants arranged financing cards along five stages of a technology-to-finance pathway: **technical assistance, project preparation, demonstration or pilot, investment and deployment, and commercial scale-up.**

For each stage, the groups identified the activities to be completed, the financing instrument required and the institution expected to lead. Participants were encouraged to consider how technological, financial and implementation risks would change as the project matured. The discussion also explored when financing could realistically become available, what preparation would be required before investors became interested, when private finance could enter and which actor would assume the greatest risk at each stage.

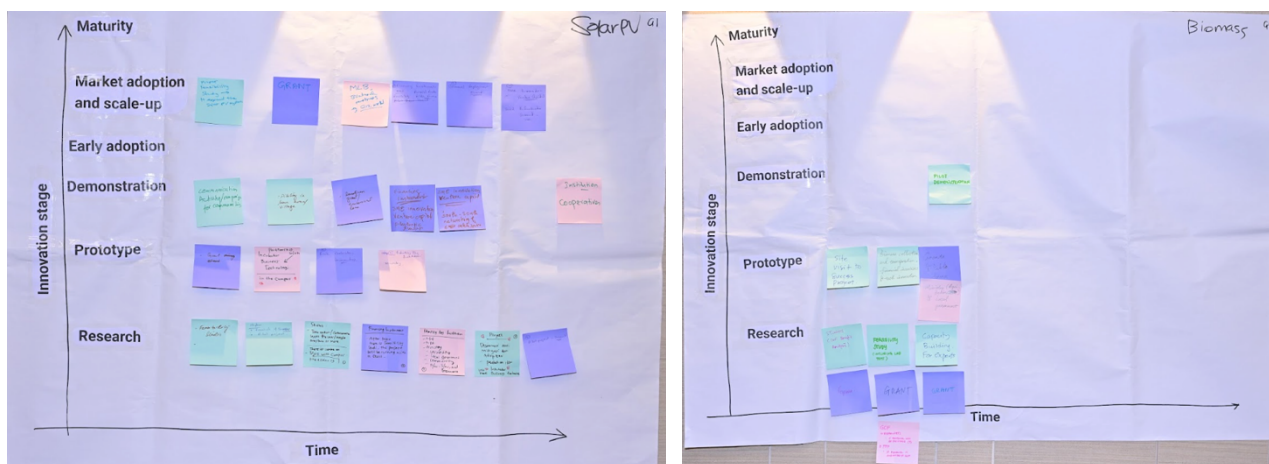


Figure 7 Step 4 - Finance discussion, sub-activity 4 Innovation stage x Time boards for Solar PV and Biomass

Sub-activity 6. Assessing institutional frictions and coordination needs

For 10 minutes, each group assessed why the selected technology might fail to reach implementation even if financing were available. Participants rated potential barriers, including a weak project pipeline, limited bankability, policy uncertainty, procurement constraints, utility debt, foreign-exchange risk, limited investor confidence, weak institutional coordination and insufficient local financial or technical capacity, on a scale from one to five.

Based on the assessment, each group identified its most significant barrier, the critical financing instrument required and the most important Technology Mechanism (TM)-Financial Mechanism (FM) coordination need. Participants then reflected on the support that could be provided by the NDE and NDA respectively, and identified where stronger coordination would be required in terms of the theme, timing, mode and format of engagement. Group representatives subsequently presented their selected technology, priority barrier, proposed financing pathway and coordination needs to the plenary.



Figure 8 Step 4 - Finance discussion, assessing frictions and assumptions

The exercise reinforced that financing a technology is not a single transaction. It is a sequenced process that combines technical assistance, project preparation, policy and regulatory support, risk reduction, investment mobilization and coordination among technology and finance actors. It also highlighted the complementary roles of public finance in creating markets and reducing risk, and private finance in supporting commercial deployment and scale-up.

Annex IX captures all boards 5 groups worked on. Below table summarizes each group's boards. Overall, across all five groups, technology selection was only the starting point. Common needs included early feasibility and investment preparation, pilot demonstrations, clear policy and tariff arrangements, appropriate environmental and social safeguards, stronger technical and institutional capacity, and coordination between NDEs, NDAs, line ministries, utilities, project proponents and financial institutions. Public and concessional finance were considered most important during early and risk-intensive stages, while commercial and private finance became more relevant once technical performance, bankability and implementation arrangements had been demonstrated.

Top 3 potential TM-FM linkage project ideas extracted from consolidated group analyses are:

- **Solar-to-Grid Accelerator** addressing a mature technology blocked mainly by market and infrastructure conditions.
- **Hydropower Platform** addressing a mature technology requiring integrated climate, water, safeguard and financing decisions.
- **Maldives Demonstrator** addressing an emerging technology requiring public risk-bearing finance before commercial investment can participate.

Of the three, the Solar-to-Grid Integration Accelerator offers the strongest near-term opportunity because several countries already have mature Solar PV markets and identifiable investment demand. The hydropower platform provides a medium-term regional pipeline, while the Maldives demonstrator offers a strategically important innovation pathway with wider relevance to SIDS.

Table 3. Step 4 - Consolidated Analysis of Group Outputs

Group	System transformation challenge	What is actually constraining deployment	Required intervention pathway	Financing logic	Implications for NDE-NDA coordination
Group A - Pakistan, Sri Lanka, Bangladesh and Indonesia Solar PV	The technology is mature, but the electricity system is not yet structured to absorb and reward large-scale distributed renewable energy.	The principal constraints were grid inflexibility, weak or uncertain power-purchase arrangements, tariff and grid-parity issues, incumbent utility structures and continued advantages for fossil-fuel generation . In Indonesia, PLN's generation overcapacity and dominant grid position were identified as direct constraints. Limited technical data, land availability and the small number of renewable-energy producers further reduce deployment opportunities.	The pathway needs to begin with grid and market diagnostics, followed by feasibility studies, community or household demonstrations, development of local business models and targeted grid upgrades. Policy action must accompany the technology work, particularly on tariffs, power purchasing, grid access and treatment of independent renewable-energy producers.	Grants remain appropriate for feasibility studies, technical data, early pilots and community-level demonstration. Concessional finance and public investment are needed for grid infrastructure and market-enabling measures. Commercial lending, vendor credit, equity and venture capital become more relevant for mature Solar PV businesses once off-take and regulatory risks are reduced.	NDE-NDA coordination must go beyond identifying Solar PV projects. It should bring utilities, energy regulators, finance ministries and financial institutions into the project-design process. The NDE can define the technology and system requirements, while the NDA can support the structuring of grid, policy and financing interventions as one investment package.
Group B - Philippines, India, Kyrgyzstan and Turkmenistan Solar PV and hydropower	Countries are attempting to deploy two relatively mature technologies, but their institutional and project-development capacities remain uneven. The group therefore faced a broader deployment-readiness challenge rather than a single technological barrier.	Constraints included weak feasibility and investment preparation, limited modelling and technical expertise, insufficient knowledge of climate-finance procedures, unclear renewable-energy policies, tariffs on imported equipment, land and site-selection issues, uncertain private-sector returns and geopolitical risks. Hydropower also raised resettlement,	The group proposed a staged pathway: investment preparation and feasibility assessment, pilot demonstration, capacity building, policy and regulatory development, and market deployment. However, the pathway must differentiate between modular Solar PV and capital-intensive hydropower. Solar PV	Grants are needed for feasibility, technical assessment and institutional capacity. Concessional finance can support pilots and early deployment. Hydropower requires guarantees, insurance, development-bank participation and long-term debt, while Solar PV can transition earlier towards commercial lending and private investment.	The group explicitly identified a project-governance structure: the NDE initiates and frames the technology need; the NDA connects the concept with climate-finance channels; the Accredited Entity structures and implements the project; and ministries provide sector oversight. This suggests that weak role

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Group	System transformation challenge	What is actually constraining deployment	Required intervention pathway	Financing logic	Implications for NDE-NDA coordination
		safeguard and long-term investment concerns.	can move more quickly through pilots and concessional deployment, while hydropower requires longer preparation, safeguards, insurance and more complex investment structures.		definition, rather than the absence of actors, is a key implementation gap.
Group C -Lao PDR, Bhutan, Uzbekistan and Thailand Hydropower	Hydropower is technically mature but institutionally complex because it sits at the intersection of energy generation, water allocation, climate risk, infrastructure, environmental safeguards and long-term public investment.	The major constraints were high capital requirements, uncertain future water availability, competition among energy, agriculture and other water uses, limited technical and R&D capacity, weak tariff incentives and difficult legislative reform. Projects also require credible off-takers, project vehicles, safeguards and clear arrangements for risk allocation.	Early preparation must combine technical feasibility, water-resource and climate analysis, environmental and social assessment, investment viability, off-taker identification and business-model design. Small and large hydropower require different pathways: small hydropower can support decentralized or rural systems, while large hydropower requires national infrastructure planning and consortium-based project preparation.	Grants and technical assistance are suitable for feasibility, impact and safeguard work. Subordinated finance, concessional loans and guarantees can absorb early project risk. Small hydropower may be financed through special-purpose vehicles involving private firms or state-owned enterprises. Large hydropower may require blended structures combining government contributions, development-bank finance, commercial lending and equity.	Hydropower requires the strongest interministerial coordination of all the group cases. NDE-NDA engagement must include water, agriculture, environment, finance and infrastructure institutions. The central coordination question is not simply how to finance a power plant, but how to reconcile national water, energy and development objectives before financing is sought.
Group D - Malaysia Biomass	The central challenge is not the conversion technology alone, but whether a reliable and	Barriers included inadequate information on feedstock quantity and composition, high collection and transportation	The pathway should begin with resource mapping, feedstock characterization, cost-	Grants are appropriate for data collection, studies, capacity building and technology adaptation. Public and	NDE-NDA coordination must include agriculture, waste-management, energy, environment and

Group	System transformation challenge	What is actually constraining deployment	Required intervention pathway	Financing logic	Implications for NDE-NDA coordination
	commercially viable feedstock-to-energy system can be established.	costs, weak technical capacity, land constraints, fossil-fuel subsidies, tariff rigidity and demanding environmental and social requirements. The profitability of biomass therefore depends on the entire supply chain rather than plant performance alone.	benefit analysis and laboratory testing. This should be followed by development of collection and transportation models, expert capacity building, adaptation of proven technologies and a demonstration project. The pilot must test not only conversion efficiency, but also logistics, supply reliability, tariff requirements and environmental performance.	concessional finance are needed for demonstration because commercial viability has not yet been established. GCF Readiness or project-preparation support could develop the enabling system, while commercial finance should enter only after feedstock contracts, revenue models and operating costs are demonstrated.	local-government institutions. The NDE can define technology and feedstock requirements, while the NDA can support a financing structure that covers both the conversion facility and the upstream supply chain. Financing only the plant would leave the principal system risk unresolved.
Group E - Maldives Energy storage and OTEC	The selected technologies are strategically relevant for an island system but remain at an earlier stage of technological and commercial readiness. The group therefore faced a first-of-a-kind demonstration and market-entry challenge .	Major constraints included high capital costs, limited operating evidence, unclear risk allocation, grid-integration requirements, regulatory barriers, dominant utility arrangements and existing commitments to gas-based generation. Coordination gaps between marine-resource and energy institutions further complicate OTEC development.	The pathway must begin with pre-feasibility, resource and grid studies, followed by cost-benefit analysis and a carefully designed demonstration project. The demonstration must establish technical reliability, system value and a viable business model. Regulatory work is also required to clarify market entry, utility obligations, grid access	Grant and concessional resources are essential for studies and demonstration because private finance cannot reasonably absorb first-of-a-kind technology risk. Blended finance and guarantees may support an initial commercial project once technical viability is established. Commercial banks and private investors should enter only after performance, revenue and risk-	NDE-NDA coordination must start earlier than the financing stage. Marine authorities, energy regulators, utilities, financial institutions and development partners need to jointly define the project before a funding proposal is developed. The NDA's role is to mobilize risk-bearing and concessional capital, while the NDE must ensure that the project

Group	System transformation challenge	What is actually constraining deployment	Required intervention pathway	Financing logic	Implications for NDE-NDA coordination
			and treatment of existing fossil-fuel contracts.	allocation arrangements are credible.	responds to grid and technology-system needs rather than being treated as an isolated demonstration.
Cross-group synthesis	The groups represented three different transformation situations: mature technologies blocked by system conditions such as Solar PV; mature but institutionally complex infrastructure such as hydropower and biomass; and emerging or first-of-a-kind technologies such as OTEC and advanced storage.	Across the groups, the principal barriers were rarely the absence of technology. They were weak project preparation, unsuitable tariffs and regulations, inadequate infrastructure, uncertain revenue models, limited domestic capacity, incumbent interests and fragmented institutional responsibilities.	Technology support must therefore progress from technology identification to system diagnosis, feasibility and business-model development, policy and regulatory reform, demonstration, investment preparation and eventual scale-up. The sequence and level of risk vary by technology maturity.	Public and concessional finance are required not only to fund projects, but to create the conditions under which projects become investable. Grants address knowledge and preparation gaps; concessional and subordinated finance absorb early risks; guarantees and blended finance support deployment; and commercial capital enters only when revenue, technical and institutional risks have been sufficiently reduced.	NDE-NDA coordination should function as an ongoing project-development mechanism rather than a final endorsement step. NDEs bring technology, system and stakeholder knowledge; NDAs bring financing pathways, Accredited Entity engagement and investment structuring. Their joint role is to assemble a coherent pathway from national technology priorities to implementable and finance-ready programmes.

ANNEX I - Participant List

In-person participants					
Country / Organization	First Name	Last Name	Title	Affiliation	Position
Bangladesh	Nurun	Nahar	Dr	Ministry of Environment Forest and Climate Change	Additional Secretary
Indonesia	Lyta	Permatasari	Dr	Ministry of Environment and Forestry	Community Development Analyst
Japan	Ryosuke	Tanaka	Mr	Ministry of Economy, Trade and Industry (METI)	Section Chief, Global Environmental Affairs Office
Kyrgyzstan	Aigerim	Kurmanova	Ms	Climate Finance Center under the Cabinet of Ministers of the Kyrgyz Republic	Senior Expert, Project Preparation Department
Lao PDR	Vathsouda	Nilathsay	Ms	Ministry of Agriculture and Environment	Deputy Director of Division, Department of Environment
Malaysia	Rudy	Eruwan	Dr	Ministry of Natural Resources, Environmental Sustainability	Senior Assistant Secretary, Climate Change Division
Maldives	Amjad	Abdullah	Mr	Ministry of Tourism and Environment	Director General
Pakistan	Imran	Khan	Mr	Ministry of Climate Change and Environmental Coordination	Assistant Director
Sri Lanka	Leel	Randeni Pidunwaththage	Mr	Ministry of Environment	Director (Climate Change)
Thailand	Surachai	Sathitkunarat	Dr	Ministry of Higher Education, Science, Research and Innovation	President, Office of National Higher Education Science Research and Innovation Policy Council
Uzbekistan	Sanjarbek	Ibragimov	Mr	Uzhydromet (Hydrometeorological Service of Uzbekistan)	Chief Specialist
Bhutan	Sangay	Chojay	Mr	Ministry of Finance	Sr Program Officer, Development Coordination and Debt Management Division, Department of Macro-Fiscal and Development Finance
India	Swathi	Senan	Ms	Ministry of Environment, Forest and Climate Change	Assistant Director, Economic Division
Lao PDR	Alounxay	Onta	Mr	Ministry of Agriculture and Environment	Director General, Department of Planning and Cooperation
Malaysia	Marzuki Bin	Mustaffa	Mr	Ministry of Natural Resources and Environmental Sustainability	Assistant Secretary, Climate Change Division

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ANNEX II - Group Photo



Link to social media: <https://www.linkedin.com/feed/update/urn:li:activity:7480596598700376064/>

Annex III - Step 1 Planning: Country status cards

Country Status CARD – Bangladesh

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

By 2035, mitigation in energy will deliver 69.84 MtCO₂e reduction. Measures include renewable expansion (solar, wind, biogas), cutting transmission losses, phasing out liquid-fuel peaking plants, electrifying 348 km of rail, shifting to MRT/BRT, promoting EVs, and improving industrial efficiency. Solar irrigation, rooftop solar, clean cooking, efficient appliances, and carbon trading for fugitive emission reductions round out the package.

Project Pipeline and Ongoing Activities

Energy

- Global Environment Facility (20.4m): Enabling Electric Vehicles (EVs) Adoption in the framework of Sustainable energy based Transportation in Bangladesh
- Green Climate Fund (340.5m): FP150 Promoting private sector investment through large scale adoption of energy saving technologies and equipment for Textile and Readymade Garment (RMG) sectors of Bangladesh

Water

- Global Environment Facility (16.35m): Community-based Climate Resilient Fisheries and Aquaculture Development in Bangladesh
- Adaptation Fund (20m): Livelihood Adaptation for Flood-affected Communities in Bangladesh
- Adaptation Fund (5m): Strengthening Climate Resilience through Locally-Led Housing Solutions in the Haor (Flash Flood prone) Region of Bangladesh
- Green Climate Fund (50m): FP206 Resilient Homestead and Livelihood support to the vulnerable coastal people of Bangladesh (RHL)

National Policy on Energy & Water

Energy and Power System Master Plan 2026 (EPSMP 2026): draft EPSMP 2026 projects renewables to comprise about 47% of the installed power generation capacity of 89.1 gigawatts (GW) in 2050 & plans to deploy CCS as an advanced decarbonisation technology that, despite demonstration efforts across the globe, is yet to reach maturity. / EPSMP 2026 envisages that the country's primary fuel imports will fall below 50%, based on the assumption that Bangladesh will produce around 24 million tonnes of domestic coal in 2050.

Bangladesh Delta Plan 2100 (BDP 2100): Goal 1: Ensure safety from floods and climate change related disasters; Goal 2: Enhance water security and efficiency of water usages; Goal 3: Ensure sustainable and integrated river systems and estuaries management; Goal 4: Conserve and preserve wetlands and ecosystems and promote their wise use; Goal 5: Develop effective institutions and equitable governance for in-country and trans-boundary water resources management; and Goal 6: Achieve optimal and integrated use of land and water resources.

Country Status CARD – Indonesia

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Under the scenario compatible with 1.5 C goals (LCCP), greenhouse gas emissions will peak in 2030 at 1,244 MtCO₂e and then decline and continue to decline to reach 540 MtCO₂e in 2050. It is expected that net zero emissions (NZE) will be achieved by 2060.

Project Pipeline and Ongoing Activities

Energy

- Global Environment Facility (38.8m): Indonesia's Net-Zero and Nature-Positive Acceleration through Integrated Actions in the Energy and Industrial Sectors
- Global Environment Facility (98m): IBRD Geothermal Energy Upstream Development Project
- Green Climate Fund (223.8m): FP083 Indonesia Geothermal Resource Risk Mitigation Project
- Green Climate Fund (103.8m): FP130 Indonesia REDD-plus RBP for results period 2014-2016
- Green Climate Fund (247.7m): FP196 Supporting Innovative Mechanisms for Industrial Energy Efficiency Financing in Indonesia with Lessons for Replication in other ASEAN Member States

Water

- Global Environment Facility (49.65m): Lake Ecosystem Restoration in Indonesia through Integrated Governance, Landscape, and Community-based Approaches
- Adaptation Fund (5.97m): Safeguarding-Surviving-Sustaining towards Resilience: 3S Approach to Build Coastal City Resilience to Climate Change Impacts and Natural Disasters in Pekalongan City, Central Java Province
- Adaptation Fund (0.25m): Developing "Climate Smart Community" System to Increase Climate Resilience for Sadang Watershed Communities
- Adaptation Fund (0.82m): EMBRACING THE SUN: Redefining Public Space as a Solution for the Effects of Global Climate Change in Indonesia's Urban Areas
- Adaptation Fund (0.96m): Enhancing the adaptation capability of coastal community in facing the impacts of climate change in Negeri (village), Asilulu, Ureng and Lima of Lohit District Maluku Tengah Regency Maluku Province
- Adaptation Fund (0.99m): Sustainable Landscape Governance, Towards Climate Resilience of Community in Tempe Lake Ecosystem

National Policy on Energy & Water

Indonesia's 2014 National Energy Policy, the Indonesian Government has set certain targets for diversifying Indonesia's primary energy mix by 2050. Under the Policy, the role of oil should be less than 25% by 2025 and less than 20% by 2050, the role of natural gas should be less than 22% by 2025 and less than 24% by 2050, and the role of natural gas should be less than 50% by 2025 and less than 25% by 2050. While the Policy calls for minimizing the use of oil and optimizing natural gas utilization (Article 11), it also envisages increased fossil fuel exploration and production (Article 10) and continued use of coal as the reliable national energy supply.

Indonesia National Urban Water Supply Program: the Rencana Pembangunan Jangka Menengah Nasional National Medium Term Development Plan (RPJMN) sets a target of 10 million new household connections for piped water. The target relies on PDAMs, water utilities responsible for the provision of piped water.

Country Status CARD – Bhutan

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

- Reducing fossil fuel dependence, improving energy efficiency, and enhancing the renewable energy mix.
- Renewable energy: increasing energy generation from hydro, solar, wind, distributed energy resource systems and piloting green hydrogen.
- Energy in industries: use of refuse derived fuel for the cement industry, adoption of green hydrogen in transport and industries, energy efficiency in cement plant, waste heat recovery in cement and ferro-alloy plants, ultra high-power transformer in ferro-alloy industries, neural network for process control, direct heat charge in steel industry, installation of insulated gate bipolar transistor technology-based induction furnace, ladle pre-heating, conversion of fossil fuel based boiler to electric, and energy efficiency in manufacturing.
- Energy efficiency: energy efficiency measures in buildings, standards and labelling for appliances, biogas cooking, solar water heating, and green kitchens in institutions.
- Transport: adoption of stringent fuel emission standards, promotion of electric vehicles, increase in shared mobility, introduction of light-rail transit, promotion of non-motorized transport, and cross-border freight trains.
- Creating enablers: development of Energy Market Platform, update of National Transmission Grid Master Plan (NTGMP), enhancement of STAR-C lab, development of National Energy Act.

National Policy on Energy & Water

National Energy Policy 2025: achieve a total installed capacity of 25,000 MW by 2040 to support the national agenda of "High-income GNH Economy by 2034" and power long-term energy security. This includes harnessing 15,000 MW from our vital hydropower resources while simultaneously making a transformative leap by adding 5,000 MW from solar energy, alongside tangible contributions from wind, geothermal, biomass, and other complementary renewables. / The Hydrogen Roadmap envisages production of 70,000 tons of green hydrogen by 2040-50 for use mainly in transport and industry sectors.

Country Status CARD – Kazakhstan

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Reduction of GHG emissions by 15% by the end of 2030 relative to 1990 base year.

National Policy on Energy & Water

Reduction of GHG emissions by 15% by the end of 2030 relative to 1990 base year: "By 2029, the NDP aims to achieve several targets: (1) GDP to reach US\$450 billion (compared to US\$264 billion in 2023); (2) GDP per capita of US\$21,055 (US\$13,277 in 2023); (3) real economic growth rate of 6.7% year-on-year (5.1% in 2023); and life expectancy of 77 years (75.09 years in 2023). By 2029, renewable energy (RE) sources shall account for 12.5% of total energy production and measures shall be taken to develop circular economy principles including more efficient use of resources.

Strategy Kazakhstan-2050: New Political Course of the Established State: By 2050 alternative and renewable energy sources must provide for at least a half of country's total energy consumption. Water Resources Management System Development for 2024-2030: "reduce unproductive water losses during transportation from 50 to 25%, and to increase available water resources by 2.4 cubic kilometers. In general, the implementation of the planned approaches will make it possible to increase the area of irrigated land to 2.5 million hectares by 2030.

To stimulate farmers to apply water-saving technologies, the share of subsidies for irrigation systems, as well as for the purchase of drip and sprinkler irrigation equipment will be increased from 50% to 80%. It is expected that due to this, the area of irrigated land with water-saving technologies will increase to 1.3 million hectares, about 2.1 cubic kilometers of water will be saved, and the yield of agricultural products will increase significantly.

Country Status CARD – Cambodia

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Increase renewable energy share to 72% (up to 80% conditionally), adoption of grid modernization technologies, phase out coal, promote energy efficiency, adoption of clean cooking and passive cooling solutions. On Transport, expand electric mobility, improve public transport, and shift freight to rail and waterways. On Manufacturing Industries and Construction, enhance energy efficiency, promote sustainable energy use, and adopt low-carbon technologies in brick and cement sectors.

Agriculture: Promote climate-smart agricultural practices including the adoption of Alternate Wetting and Drying (AWD) and water management, reduce chemical inputs and residues burning and expand biogas use.

Project Pipeline and Ongoing Activities

Water

- Global Environment Facility (24.05m): Climate Adaptation and Resilience in Cambodia's Coastal Fishery Dependent Communities
- Adaptation Fund (5m): Climate Change Adaptation through Protective Small-scale Infrastructure Interventions in Coastal Settlements of Cambodia
- Global Climate Fund (240m): FP270 Climate Adaptive Irrigation and Sustainable Agriculture for Resilience (CAISAR) in Cambodia

National Policy on Energy & Water

National Energy Efficiency Policy (NEEP) 2022 – 2030:

- Improvement in energy security
- Reduction of energy cost and higher overall economic competitiveness
- Reduction of living costs and poverty alleviation
- Reduction of greenhouse gas emissions (GHG) and other environmental pollutants
- Creation of new markets for energy efficiency technologies and services

Water Infrastructure & Smart Energy Joint Programme (WISE JP): to ensure that children and families—especially those in hard-to-reach areas—benefit from affordable and sustainable clean water powered by renewable energy.

Country Status CARD – India

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Achieve 60% of its cumulative installed electricity capacity from non-fossil fuelbased energy sources and create additional carbon sink.

To reduce the GHG intensity of its economy by 33-35% by 2030 relative to 2005 levels/ India has put in place comprehensive policy and action plans to achieve its NDCs particularly through the National Mission on Enhanced Energy Efficiency and the promotion of renewable energy, in particular solar, hydro, and wind power and biofuels.

National Policy on Energy & Water

Draft National Electricity Policy 2026: ministry said, targeting an increase in per capita electricity consumption from 1,460 kWh in 2024-25 to 2,000 kWh by 2030 and more than 4,000 kWh by 2047. It also aligns with India's climate commitments, including reduction of emissions intensity by 45 percent below 2005 levels by 2030 and the achievement of net zero emissions by 2070, necessitating a decisive shift towards low-carbon energy pathways. The new policy recognises nuclear as a 'clean, reliable, and sustainable energy source with significant potential for India's long-term energy security', and, in order to expand nuclear capacity to 100 GW by 2047

UNIVERSAL SAFE DRINKING WATER ACCESS TO ALL BY 2030: Significant progress has been made in the country since the launch of Jal Jeevan Mission, towards enhancing access to tap water to rural households. So far, as reported by States/UTs as on 03.03.2026, under JMJ more than 12.58 Crore additional rural households have been provided with tap water connections. Thus, as on 03.03.2026, out of around 19.36 Crore rural households in the country, around 15.82 Crore (81.71%) households are reported to have tap water supply in their homes.

Energy

- Global Environment Facility (56.73m): Accelerating sustainable energy transition for decarbonization of micro, small and medium manufacturing enterprises in India
- Global Environment Facility (17.8m): Improving thermal energy efficiency in the design, manufacture and operation of industrial boilers for low-carbon micro-, small and medium-sized enterprises in India
- Global Environment Facility (892m): Grid-Connected Rooftop Solar Program
- Global Environment Facility (18.22m): Organic Waste Streams for Industrial Renewable Energy Applications in India
- Global Environment Facility (152m): Partial Risk Sharing Facility for Energy Efficiency
- Global Environment Facility (26.86m): Promoting Market Transformation for Energy Efficiency in Micro, Small and Medium Enterprises
- Green Climate Fund (1.58): FP186 India E-Mobility Financing Program
- Green Climate Fund (993m): FP271 India Green Finance Facility (IGFF)

Water

- Global Environment Facility (112.36m): Transforming Andhra Pradesh aquaculture to a sustainable, reduced footprint and climate resilient food system
- Green Climate Fund (115m): SAP065 Harnessing Insurance for Climate Resilience in Indian Agriculture

Country Status CARD – Malaysia

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

By 2035, Malaysia's National Energy Transition Roadmap (NETR) outlines a robust trajectory to advance the nation's low-carbon energy transformation. Under this roadmap, coal-fired power plants are set for near-complete retirement through natural phase-outs, with no new additions planned. Renewable energy is poised to make a substantial contribution to installed capacity, while natural gas remains a key transitional fuel in the national energy mix. Malaysia is progressively phasing down the role of unabated coal in its energy mix, while promoting the transition away from fossil fuels and scaling up zero and low-emission technologies.

Managing water resources and security: Reduce Non-Revenue Water to 30%, secure reserve margins of at least 15% in all states, expand Integrated River Basin Management coverage, and strengthen national flood forecasting and early-warning systems. Mainstreaming sea level rise adaptation and protecting coastal resources: Apply safe design standards for coastal infrastructure, implement Integrated Shoreline Management Plans, restore mangroves and seagrass meadows, and operationalise the Blue Economy Blueprint.

National Policy on Energy & Water

Malaysian National Energy Policy 2022-2040:

- Increase in urban public transport modal share
- Increase electric vehicle (EV) penetration
- Alternative lower carbon fuels in heavy transport
- Use of LNG as alternative fuels in marine transport
- Increase in percentage of industrial and commercial energy efficiency savings
- Increase in percentage of residential energy efficiency savings
- Increase in total installed capacity of renewable energy (RE)
- Reduction of coal in installed capacity
- Increase in percentage of RE in total primary energy supply

National Integrated Water Resources Management Plan: aimed at bringing all water-related stakeholders nationwide onto a common platform and mission, that is, to ensure the sustainable management of the country's water resources, targeted to assist the government in expediting the implementation of IWRM nationwide through the concerted efforts of all stakeholders involved in the water sector.

Country Status CARD – Maldives

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Meet 33% of electricity needs from renewable energy sources. Expand the standard labelling program and gradually implement its mandatory phase. Enhance and upgrade electricity grids to reduce energy loss in power generation facilities nationwide.

Increase access to safe and reliable potable water to the island communities, enhancing resilience and alleviating water stress by mobilising more resources, and increasing investments to fulfil national water and climate targets. Enhance water governance by strengthening the capacity of national institutions, and developing the required human resources to address emerging challenges posed by climate change.

National Policy on Energy & Water

Energy Policy:
1. Diversifying the energy mix: Promoting the development and utilization of renewable energy sources, such as solar, wind, biomass and ocean energies, to reduce the country's dependence on imported fossil fuels and enhance energy security; 2. Improving energy efficiency: Implementing measures to enhance energy efficiency across all sectors to reduce energy consumption and lower greenhouse gas emissions; 3. Enhancing access to energy services: Ensuring universal access to affordable, reliable, and modern energy services for all citizens; 4. Strengthening energy governance: Enhancing institutional capacity, regulatory frameworks, and governance structures to facilitate the effective implementation of energy policies and programs; 5. Promoting public awareness and engagement: Raising awareness about the importance of sustainable energy practices and promoting community participation in energy conservation and renewable energy initiatives.

National Water and Sewerage Policy of the Maldives 2017:

9 following goals: Ensuring access to safe water supply and adequate sewerage services; adopting cost-effective, environmentally sound, and appropriate technologies; strengthening the legal framework; encouraging private investments in the water sector; building institutional capacity; maintaining financial and environmental sustainability; strengthen advocacy and awareness; promote research and development; protect and conserve water resources.

Project Pipeline and Ongoing Activities

Energy

- Global Environment Facility (15.31m): Decarbonisation and sustainable cities for a net-zero future in Malaysia
- Global Environment Facility (59.42m): Accelerating the adoption and scale-up of climate-smart transport in Malaysia

Water

- Global Environment Facility (12.21m): Child Project of the Global Clean Hydrogen Program of Malaysia
- Adaptation Fund (10m): Nature-based Climate Adaptation Programme for the Urban Areas of Penang Island

Country Status CARD – Lao PDR

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Total target installed hydropower capacity in the country by 2030 is set at 13 GW, by applying an 80% probability ratio to the 2030 anticipated installed capacity in Ministry of Energy & Mines' 2016-2030 Power Development Plan. 50,000 energy efficient cook stoves will reduce the use of non-renewable biomass for combustion, then a new target in the transport sector is introduced to replace M4 target in the 2015 NDC, which has not been implemented, namely the construction and operation of a new bus rapid transit system in Vientiane Capital and associated Non-Motorized Transport (NMT) component, as well as the construction and operation of a Lao-China railway, which will displace the use of internal combustion engine private vehicles. (Conditional mitigation target) 50,000 hectares adjusted water management practices in lowland rice cultivation

National Policy on Energy & Water

Renewable Energy Development Strategy: aims to achieve a renewable energy share of:

- 3% in total energy consumption by 2025.
 - 10% in total transport energy consumption (using biofuels) by 2025.
- Key objectives of the policy are encouraging domestic and foreign investment in renewable energy at the local (village) level to enable a better electricity supply, create socio-economic benefits and sustain an environmentally and socially sustainable development. Policy priorities are focussed on small power development for self sufficiency and grid connection, biofuels production and marketing, i.e. through financial incentives to investors and by improving law and regulations on renewable energy.

Water Sector Transformation 2040 (WST 2040):

- empowering people to ensure that the transformation is implemented;
- strengthening governance at all levels;
- enhancing the capacity of data driven decision-making;
- strengthening financial capacity; and
- developing sustainable infrastructure with cost effective technology.

Country Status CARD – Mongolia

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Reducing dependency on coal-fired energy, and switching to more cost-effective, reliable, and sustainable energy sources.

Increase the capacity of the water resource sector to adapt to climate change and reduce vulnerability and risks to ensure water security.

Enhance the resilience of the water sector through the utilization of advanced technologies for conservation, restoration, sustainable use and secure water availability

National Policy on Energy & Water

Vision 2050:
target to achieve 30% renewable energy capacity by 2030. The 2021 New Recovery Policy, a supporting policy to enhance the implementation of Vision 2050, includes a section on energy policy, which focuses on enhancing energy production and supply reliability by developing renewable energy facilities. Vision 2050 superseded the 2015 State Policy on Energy.

Project Pipeline and Ongoing Activities

Energy

- Green Climate Fund (75.7m): FP117 Implementation of the Lao PDR Emission Reductions Programme through improved governance and sustainable forest landscape management

Water

- Global Environment Facility (28.68m): Promoting climate-resilience through ecosystem-based adaptation (EbA) solutions in the Northern Lao PDR
- Global Environment Facility (36.35m): Climate Adaptive River Basins in Sayaboury
- Global Environment Facility (19.23m): Climate Change Adaptation in Lowlands of Lao PDR
- Global Environment Facility (27.46m): Integrated Water Resource Management and Ecosystem-based Adaptation (EbA) in the Xe Bang Heng River Basin and Luang Prabang City
- Adaptation Fund (7.56m): Enhancing Adaptive Capacity in Lao PDR Provinces, and Building Resilient Housing in Vulnerable Communities
- Green Climate Fund (11.5m): SAP009 Building resilience of urban populations with ecosystem-based solutions in Lao PDR

Country Status CARD – Kyrgyzstan

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Increase the renewable energy share to 2% in 2026 and 14.3% in 2030.

Project Pipeline and Ongoing Activities

Water

- Global Environment Facility (35.22m): Promoting Climate Resiliency of Water Supplies in Kyrgyzstan
- Adaptation Fund (10m): Regional Resilient Pastoral Communities Project -ADAPT
- Green Climate Fund (9.6m): SAP002 Climate services and diversification of climate sensitive livelihoods to empower food insecure and vulnerable communities in the Kyrgyz Republic

National Policy on Energy & Water

Green Economy Development Programme from 2025 to 2029 (GEDP): aims to stimulate sustainable economic growth, introduce innovative solutions, and raise environmental standards. It's the culmination of dedicated efforts by various national and international partners.

by 2029:

- Reduce GDP energy intensity by 20% compared to the 2022 level.
- Increase agricultural productivity by 25% compared to the 2022 baseline.
- Restore 30% of degraded land and territories.
- Achieve a 30% share of "green" public procurement, in line with the approved indicator matrix.
- Ensure widespread introduction of renewable energy sources and energy-efficient technologies in both production and social sectors.*

Country Status CARD – Nepal

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Expand renewable electricity generation capacity to 14,031 MW by 2030 and 28,500 MW by 2035. Decrease the total system transmission and distribution losses to 11.50% and 10.50% by 2030 and 2035 while upgrading the transmission and distribution lines and substation capacity. In 2030 and 2035, increase sales of battery electric vehicles (BEVs) to 90% and 95% for all private passenger vehicles (including 2-wheelers), and to 70% and 90% for all public passenger vehicles respectively.

By 2030, 50% of the population, including women, children, and socially marginalized people, will benefit from safely managed and low-carbon water supply services. Groundwater cluster projects for irrigation will cover an additional 112,500 ha and 318,000ha by 2030 and 2035 respectively using renewable energy. Lift irrigation projects will be developed to irrigate additional 111,500 ha using renewable energy by 2030.

National Policy on Energy & Water

National Energy Efficiency Strategy, 2075 (2019):
goal: To double the average improvement rate of energy efficiency in Nepal from 0.84% per year, which existed during the period of 2000- 2015 AD to 1.68% per year in 2030 AD.

National Water Plan:

By 2007: Thirty-five per cent of the households are supplied with INPS electricity, 8% by isolated (micro and small) hydro systems and 2% by alternative energy. Per capita electricity consumption of 100 kWh is achieved. –By 2017: Fifty per cent of households are supplied with INPS electricity, 12% by isolated (micro and small) hydro systems and 3% by alternative energy. ~ Per capita electricity consumption of 160 kWh is achieved. –By 2027: Seventy-five per cent of the households are supplied with INPS electricity, 20% by isolated (micro and small) hydro systems and 5% by alternative energy. Per capita electricity consumption of over 400 kWh is achieved.

Country Status CARD – Philippines

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

The Philippines commits to a projected GHG emissions reduction and avoidance of 75%, of which 2.71% is unconditional and 72.29% is conditional, 10 representing the country's ambition for GHG mitigation for the period 2020 to 2030 for the sectors of agriculture, wastes, industry, transport, and energy.

Project Pipeline and Ongoing Activities

Energy

- Global Environment Facility (77.48m): Accelerating the adoption and scale-up of electric mobility for low-carbon city development in the Philippines

Water

- Global Environment Facility (13.2m): Child project of the Global clean hydrogen programme of Philippines
- Adaptation Fund (9.99m): Harnessing the Water-energy-food Nexus to Address and Adapt to Climate Change Impacts in Tawi-Tawi

National Policy on Energy & Water

Philippine Energy Plan 2023-2050:

aims to achieve over 40% renewable energy in the total energy mix by 2030 and surpass 50% by 2040, while also incorporating nuclear energy and gradually reducing reliance on fossil fuels. The previous 2016-2030 plan provided the following targets for energy outlook (the base year used for the projections is 2015):

- 1) existing, committed, indicative and potential power projects + 30 percent share of RE in the capacity mix and higher natural gas share in power generation mix by 2030;
- 2) energy savings on all sectors for electricity and petroleum products of at least 6 percent yearly from 2016 to 2030;
- 3) increased utilization of alternative fuels for transport (CNG and electricity) from 2016-2030;
- 4) 10 percent biodiesel blend for 2030; 20 percent bioethanol blend for 2030.

Country Status CARD – Thailand

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

A primary area of investment is the energy transition, which specifically encompasses initiatives in green energy, green transportation, and green industries. This vital sector alone is projected to require substantial funding: an estimated USD 6.11 billion by 2035, without inflation rate consideration

Thailand reviews GST outcomes, such as setting economy-wide emission reduction targets for all greenhouse gases; tripling renewable energy capacity and doubling energy efficiency improvements by 2030; reducing coal power; transitioning away from fossil fuels; advancing zero and low-emission technologies; and shifting to sustainable lifestyles and sustainable patterns of consumption and production

National Policy on Energy & Water

National Strategy (2018-2037):

EE priorities:

4.5.4 Enhancing energy efficiency through energy intensity reduction by supporting energy conservation and efficient use of energy to reduce the national cost of energy through financial and non-financial tools and legal measures; encouraging energy-saving building design; promoting financial incentives and enforcement of building and design regulations; mounting campaigns and knowledge sharing to educate the public about energy-saving; encouraging use of energy-saving equipment and machinery – displaying green labels on energy-saving vehicles and equipment; supporting environmentally friendly logistics and transportation.

RE priorities:

The importance of alternative energy as well as food and energy security will also increasingly be focused. – 4.5.3 Creating national energy security and promoting eco-friendly energy usage by increasing the proportion of renewable and alternative energy used, instead of fossil-fuel sources in power generation.

Country Status CARD – Sri Lanka

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

1. Enhance renewable and clean energy contribution to the national electricity generation mix by increasing Solar PV, Wind, Hydro and Sustainable Biomass based electricity generation.
2. Introduction of grid-integrated energy storage systems, such as Pumped Storage and Battery Energy Storage Systems (BESS), to increase absorption of renewable energy and reduce thermal generation as a conditional measure.
3. Implement Demand Side Management (DSM) measures by promoting energy-efficient equipment, technologies, and system improvement s in a national Energy Efficiency Improvement and Conservation (EEIC) programme covering commercial, institutional, and residential sectors.
4. Conversion of existing fuel oil-based combined cycle power plants to Natural Gas (NG) and establishment of new NG plants as conditional measures (once the necessary infrastructure is available).
1. Integrated River Basin Management (IRBM) approach adopted in Sri Lanka.
2. Groundwater and surface water monitoring and vulnerability assessment in highly sensitive and drought-prone areas of the country, and implementing remedial measures
3. Promote, identify and implement climate-resilient water supply & sanitation.
4. Promote water conservation, efficient water use, and the reuse of treated wastewater for other purposes.
5. Establish and improve salinity barriers in rivers where intakes are subjected to climate induced saline water intrusion during the drought season.
6. Capacity building for water, health, and educational sectors and public awareness on building resilience to climate change.
7. Restoration, rehabilitation, and augmentation of existing irrigation systems.
8. Enhance water management in irrigation schemes.
9. Assess river floods and adopt mitigation measures and early warning systems for priority basins.

National Policy on Energy & Water

National Energy Policy:

1. Assuring Energy Security 2. Providing Access to Energy Services 3. Providing Energy Services at the Optimum Cost to the National Economy 4. Improving Energy Efficiency and Conservation 5. Enhancing Self Reliance 6. Caring for the Environment 7. Enhancing the Share of Renewable Energy 8. Strengthening Good Governance in the Energy Sector 9. Securing Land for Future Energy Infrastructure 10. Providing Opportunities for Innovation and Entrepreneurship

Country Status CARD – Timor-Leste

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

The decree-law will apply to natural or legal persons, national or international, public or private, with commercial or self-consumption purposes who install produce and explore electrical energy using renewable energy sources in Timor-Leste. The government aims to approve this law in 2022-2023. Will scale up investment in renewable energy systems as a means to reduce diesel consumption and improve the resilience of rural communities through engagement with innovative blended financing mechanisms, LDC-focused financing facilities, and private sector engagement. Timor Leste will prioritise investments that increase energy security and access in rural communities and will seek increased investment and engagement of the private sector to assist with the scale-up and use of low carbon technologies.

Increasing pressures on freshwater supply must be managed to maintain water access for domestic and agricultural purposes while also ensuring that changes to water availability do not increase emissions from the water sector due to the increasing use of water pumps and other infrastructure. Landscape-level integrated water resource management approaches will be reflected in Timor-Leste's revised development plans and other relevant public sector plans. Integrated water resource management projects will remain a key target investment area to support through climate financing proposals.

National Policy on Energy & Water

Strategic Development Plan 2011-2030:

Energy access targets: By 2015: 90% of Ministry of Health buildings will have access to electricity, water and basic sanitation. We will take action to ensure that by 2015 everyone in Timor-Leste will have access to reliable electricity 24 hours a day. A program for solar lighting will be supported, which will provide approximately 100,000 families with access to electric light by 2020. By 2015, Two new power stations will have been constructed in Hera and Betano providing 250 MW of electricity to support social and economic development across Timor-Leste. The Larigato wind farm will be constructed as a model wind farm development.—By 2030: All households in Timor-Leste will have access to electricity either by the conventional expansion of the electricity system or through the use of renewable energy.

RE targets -

Population growth and the needs of an expanding economy are likely to increase electricity consumption in Timor-Leste from around 160 GWh currently to 800 GWh by 2020. At least half of these energy needs will be provided by renewable energy sources.—A program for solar lighting will be supported, which will provide approximately 100,000 families with access to electric light by 2020 —By 2015: A Solar Centre will be established in Dili to demonstrate the potential of solar energy.—By 2020: At least half of Timor-Leste's energy needs will be provided by renewable energy sources.

Country Status CARD – Pakistan

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

By 2035, renewable energy (including hydropower) and clean energy are expected to reach about 38,472 MW and 43,202 MW43, representing around 62% and 69% of the planned capacity mix under ICESP 2025-2035⁵. Ensure universal access to safe drinking water in all climate vulnerable districts by 2030, in line with SDG 6. Deploy drought-resilient water supply systems and safeguard water sources against contamination, particularly after floods.

Project Pipeline and Ongoing Activities

- Global Environment Facility (10m): Reduction of greenhouse gas emissions by enhancing efficiency and transparency in Pakistan's leather industry
- Global Environment Facility (21.15m): Combating Climate Change through the Promotion and Application of Sustainable Biomass Energy Technologies in Pakistan (PASBET)

Water

- Global Environment Facility (45.38m): Decarbonization through innovative clean hydrogen technology in Pakistan (Child Project of the Global Clean Hydrogen Programme for Pakistan)
- Adaptation Fund (6.09m): Enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts in Rawalpindi and Nowshera, Pakistan
- Adaptation Fund (10m): Sustainable Actions for Ecosystems Restoration in Pakistan (SAFER Pakistan)

National Policy on Energy & Water

Alternative and Renewable Energy Policy, 2019:

intends to have at least 20% of its generation capacity as ARE technologies by 2025 and 30% by 2030 (20X25 and 30X30 target)

National Water Policy:

improved water allocation across competing demands, ensuring water for social and economic development, and supporting national food security objectives

Country Status CARD – Tajikistan

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

- Promoting water-energy-land interaction with renewable energy sources
- Modernization of existing Hydroelectric Power Stations and construction of new HPPs
- Increasing the efficiency of water use, recycling, processing and demand management
- Widespread application of the principles of integrated water resources management (IWRM)

Project Pipeline and Ongoing Activities

- Adaptation Fund (10m): An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan
- Green Climate Fund (128.9m): FP040 Tajikistan: Scaling Up Hydropower Sector Climate Resilience
- Green Climate Fund (10m): FP067 Building climate resilience of vulnerable and food insecure communities through capacity strengthening and livelihood diversification in mountainous regions of Tajikistan
- Green Climate Fund (10m): FP075 Institutional Development of the State Agency for Hydrometeorology of Tajikistan

National Policy on Energy & Water

Tajikistan Development strategy by 2030:

aims to scale up its electricity capacity from 5.1 GW in 2021 to 10 GW to enable 10 TWh of annual electricity export. Consequently, the government aims to achieve this ambition by increasing annual hydropower generation, currently accounting for 90% of total electricity generation, from 18.7 TWh to 31.6-41.6 TWh by 2030. Tajikistan's significant solar power potential could be harnessed to enhance energy security and meet several energy-policy goals simultaneously, and the government has recently set a target for non-hydropower renewable energy to provide 10% of generating capacity by 2030.

Country Status CARD – Turkmenistan

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

- Further support of research and development and testing of renewable and alternative energy technologies, as well as their adaptation to the climatic conditions of Turkmenistan; - In the short term, the introduction of small and medium-sized renewable energy installations in remote and sparsely populated areas; - In the medium and long term, the introduction of own production capacities and increasing the share of renewable energy in the country's energy balance; - Creating economic incentives for the use of renewable energy; - Complex reconstruction of irrigated lands (CRL) on an area of 70 thousand ha; - Land reclamation improvement (LR) – on an area of 170 thousand ha; - Reconstruction of existing and construction of new hydraulic structures; - Increasing the efficiency of irrigation systems through modernization and technical re-equipment; - Improving water resources management through the transition to the Integrated Water Resources management (IWRM); - Improvement of the legal regulation for management, protection, and use of water resources; - Improvement of the system of joint water resources management in the region; - Development of smart information irrigation planning systems; - Transfer of diesel pumping stations to an electric drive and using renewable energy sources (solar, wind) and other measures.

Project Pipeline and Ongoing Activities

Energy

- Global Environment Facility (29.7m): Supporting Energy Transition for Remote Settlements in Turkmenistan (SET)
- Global Environment Facility (42.98m): Developing National Capacity of Turkmenistan through Improving Regulatory Environment towards Energy Efficient and Sustainable Building Sector

National Policy on Energy & Water

The country's energy policy is being consistently implemented with the goal of ensuring the comprehensive development of the oil and gas industry and its successful integration into the global energy system. Large-scale investment projects in this area play a key role in strengthening both regional and global energy security. Exporting Turkmen natural gas to international markets is one of the main directions of the nation's energy strategy.

2021–2025 National Program on the Aral Sea:

Key objectives include providing the population with clean drinking water, developing medical services, improving land reclamation conditions, and introducing water-saving technologies.

Redirecting water that previously spread over pastures or flowed into the Amu Darya and Karakum into an artificial reservoir has become an important ecological achievement.

The Concept for developing the surrounding area for 2019–2025 provides for the creation of new irrigated lands, forest belts, and large-scale measures to prevent drought. The formation of such an artificial water body not only transforms the landscape but also contributes to restoring biodiversity in the region.

Country Status CARD – Uzbekistan

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Increasing renewable energy capacity to 25,000MW. The country plans to increase the share of energy generated using renewable sources to 54 percent over the next five years, which will cut greenhouse gas emissions by 16 million tons. There are also plans to double energy efficiency in all sectors of the economy, achieve 95 percent coverage of the solid waste collection system with 35 percent of waste used for energy generation, and expand the forest cover up to 6.1 million hectares, including 2.3 million hectares of afforestation areas in the Aral Sea region.

To increase water use efficiency by 25 percent through the modernization of irrigation systems. This includes a large-scale expansion in the use of water saving technologies from 600 thousand hectares to 2 million hectares specifically allocated for drip irrigation. Furthermore, the Strategy identifies the need to concrete-line 46 percent of irrigation canals (approximately 13,100 kilometers) to reduce water losses and improve water distribution efficiency.

National Policy on Energy & Water

Green Economy Transition Strategy for 2019-2030 (Presidential Decree No. 4477 of 4 October 2019):

- Raising the renewable energy share in the power mix to more than 25% by 2030 (as compared to 7.5% in 2020).
- Using solar collectors for water heating; increasing automation for transmission and distribution.
- Modernising and reconfiguring the power grid to increase power system stability.
- Equipping power consumption systems with smart meters.

Concept of Electricity Supply of the Republic of Uzbekistan for 2020-2030 (MoE, 2020):

larger renewable energy capacity as a main objective to improve electricity supply and set a target to increase generating capacity from 12.9 GW in 2019 to 29.3 GW by 2030 and electricity generation from 63.6 TWh in 2019 to 120.8 TWh by 2030. The variable renewables generation capacity was expected to grow by 8 GW to 2030, a sum of 5 GW of solar power and 3 GW of wind power capacity. In addition, hydropower capacity was expected to grow by 1.7 GW. The concept includes a programme to install around 150 000 solar PV plants (capacity of 2 kilowatts [kW] to 3 kW) and water heaters (200 litres on average) in 2-2.5% of households in 2021-2025. This capacity is expected to generate around 0.8 TWh of energy per year.

Country Status CARD – Vietnam

2026 Joint Programme: NDE Forum, Capacity Building on Integrating Energy Technologies, and NDE-NDA coordination in Asia

NDC Goal

Aims to reduce 15.8% of total GHG emissions by 2030 compared to BAU, equivalent to 146.3 Mt CO2eq

National Policy on Energy & Water

Resolution 328/NQ-QP: Key targets are to be achieved: total primary energy supply of approximately 150-170 million tons of oil equivalent; total final energy consumption of approximately 120-130 million tons of oil equivalent; energy savings of approximately 8-10% compared to the business-as-usual scenario; and a reduction in greenhouse gas emissions from energy activities of approximately 15-35% compared to the business-as-usual scenario.

Decision No. 1622/QĐ-TTg (master plan on water resources 2021–2030 with vision to 2050):

Aims to control the quality and reserve of water sources, improve the water storage capacity in river basins, economic zones and localities basing on climate change adaptation and ensure national defence and security. It looks towards integrated governance of the water sector on the basis of digital technology; managing and using water resources in a cyclical cycle, ensuring thrift and efficiency, serving multi purposes, and meeting the requirements of rapid and sustainable national development.

The goal by 2030 is to harmonise and distribute water resources fairly and reasonably among sectors, localities, and water exploiters and users according to the integrated planning of inter-provincial river basins. By 2025, 100 per cent of large and important river basins will have integrated planning for inter-provincial river basins; the rate of using clean water for daily life among urban population will be raised to 95 per cent – 100 per cent and 65 per cent among the rural population. On the other hand, the plans set a target of basically monitoring over 90 per cent of water exploitation and use activities; improving the efficiency and capacity of water exploitation and minimising water loss in the system of irrigation works; reducing the rate of water loss in water supply activities to 10 per cent.

Project Pipeline and Ongoing Activities

Energy

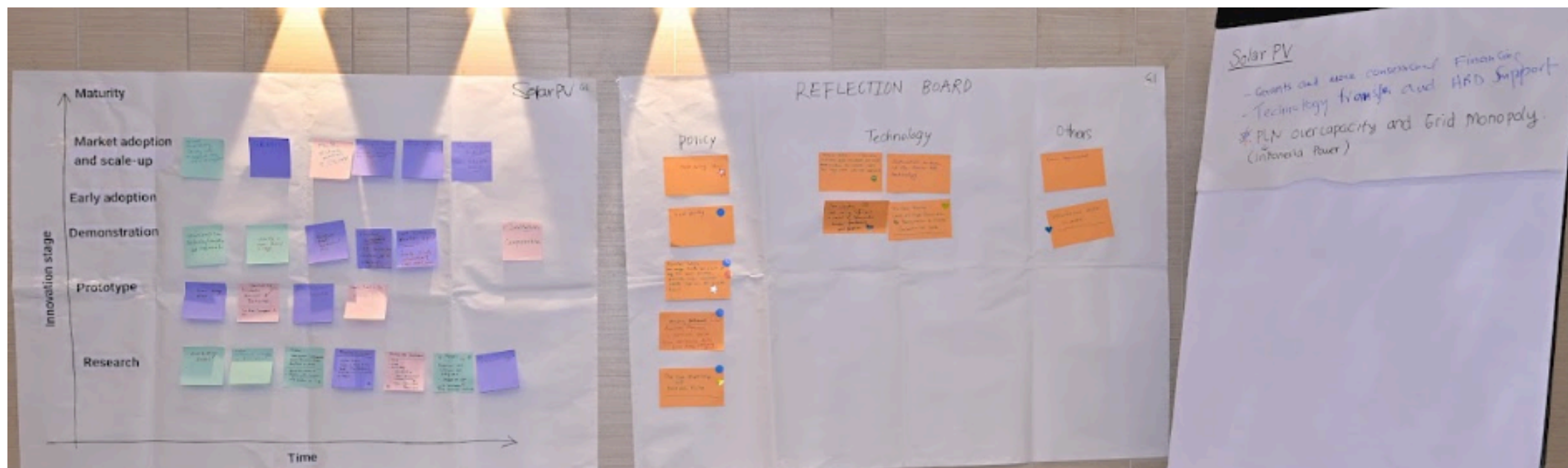
- Green Climate Fund (497.2m): FP071 Scaling Up Energy Efficiency for Industrial Enterprises in Vietnam

Water

- Global Environment Facility (77.95m): Integrated Sustainable Landscape Management in the Mekong Delta of Vietnam
- Global Environment Facility (386.7m): GEF-AF-Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods Project
- Adaptation Fund (6.35m): Enhancing the resilience inclusive and sustainable eco-human settlement development through small scale infrastructure interventions in the coastal regions of the Mekong Delta in Viet Nam
- Adaptation Fund (5m): Innovative Financial Incentives for Adaptation in Wetland Livelihoods (FIA)
- Green Climate Fund (156.3m): FP125 Strengthening the resilience of smallholder agriculture to climate change-induced water insecurity in the Central Highlands and South-Central Coast regions of Vietnam
- Green Climate Fund (10m): SAP040 Climate Adaptation and Resilience in Thua Thien Hue Province Vietnam (CoARE Hue)

ANNEX IX - Step 4 Reflection on system transformation, technology and finance discussion boards

Group A - Pakistan, Sri Lanka, Bangladesh, Indonesia (NDC: Energy systems integration, Chosen energy technology: Solar PV)



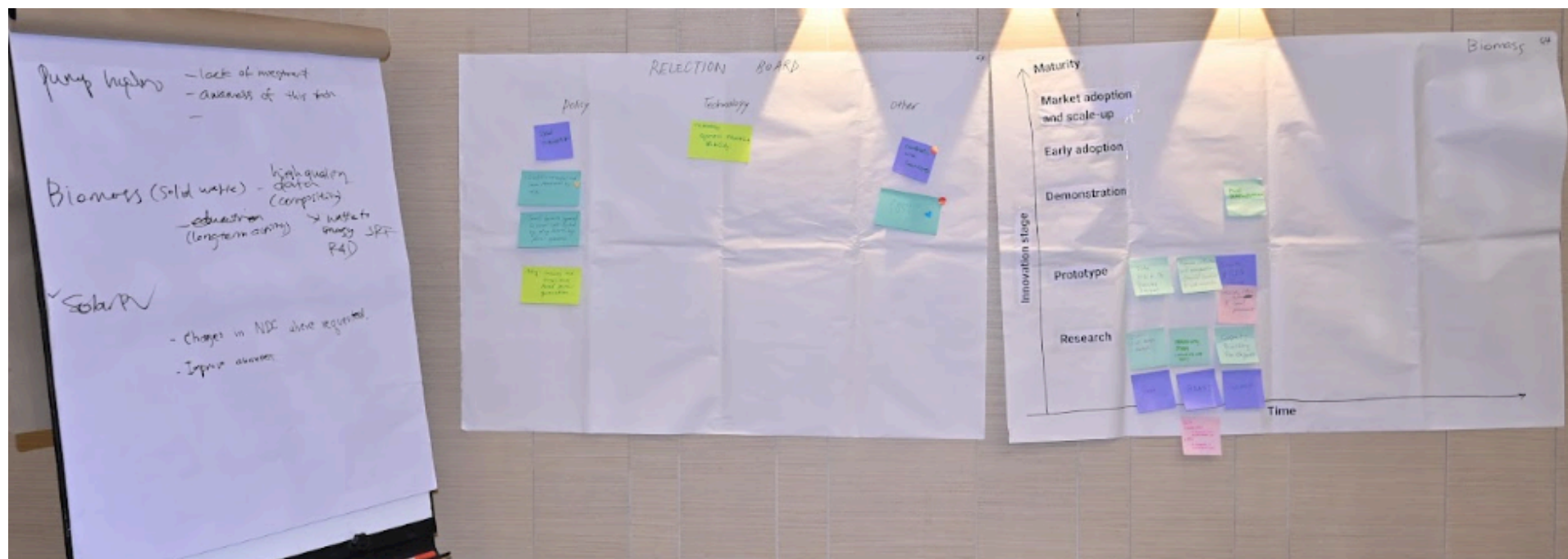
Group B - Philippines, India, Kyrgyzstan, Turkmenistan (NDC: Energy technology deployment, Chosen energy technology: Solar PV and Hydropower)



Group C - Lao PDR, Bhutan, Uzbekistan, Thailand (NDC: Energy systems integration and transition, Chosen energy technology: Hydropower)



Group D - Malaysia (NDC: Energy transition, Chosen energy technology: Biomass)



Group E - Maldives (NDC: Energy transition, Chosen energy technology: Energy storage and OTEC)

