Regional Road Map on Power System Connectivity

Status of implementation

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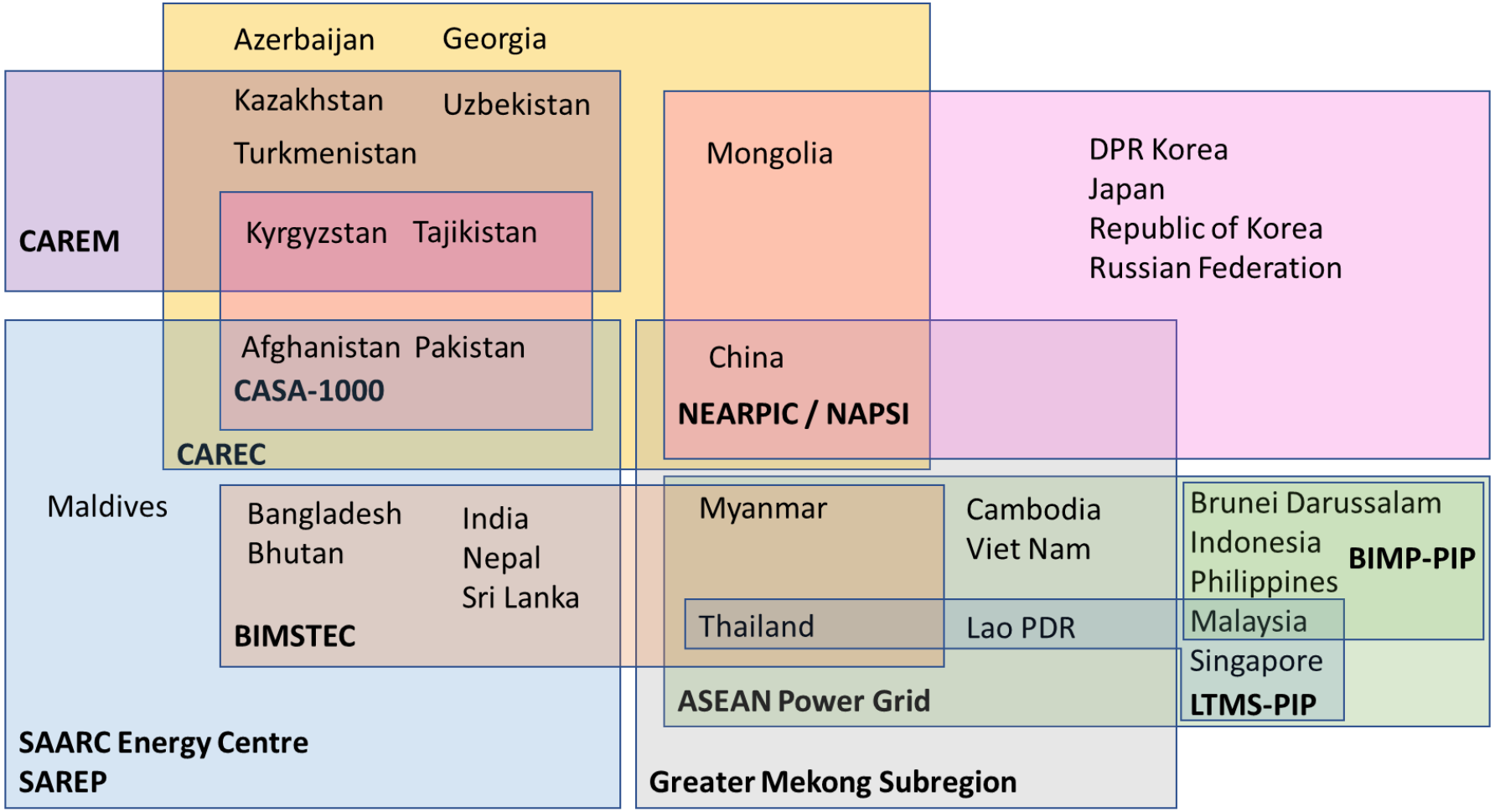
Multilateral connectivity initiatives in the region



Connectivity activities in:

South-East Asia

Greater Mekong Subregion (GMS - ADB)

ASEAN Power Grid

- AIMS III (updated and linked to RE deployment)
- LTMS-PIP
- IEA study on multilateral power trading

Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)

- MOU on regional grid interconnection between some GMS and South Asian

Australia-Singapore Power Link (AAPL)

- Granted “Major Project Status” by Australian gov

Key takeaways:

- Good level of political support but need for increased political alignment
- Regional insitutions play important role but there is limited technical and market harmonisation
- Despite coordinated planning, limited progress on cross-border infrastructure (financing challenge)
- Need for more alignment across initiatives and targeted capacity building

Regional Road Map: Strategies

Planning	• Develop a regional master plan (Strategy 2) • Coordinate cross-border transmission planning (Strategy 6)
Financing and development	• Mobilize investment in cross-border infrastructure (Strategy 7)
Operations	• Move toward multilateral trading and competitive markets (Strategy 5) • Co-ordinate cross-border system operations (Strategy 6)
Cross-cutting	• Build trust and political consensus (Strategy 1) • Develop intergovernmental agreements (Strategy 3) • Coordinate, harmonize, and institutionalize policy and reg frameworks (Strategy 4) • Build capacity and share information, data, best practices (strategy 8) • Ensure coherence of connectivity with the SDGs (Strategy 9)

Regional Road Map: Milestones

S1	• Regional meeting on grid integration convened regularly	S6	• Coordinated mechanisms for system operation and transmission utility cooperation
S2	• Map region's existing high voltage transmission by 2022 • Regional grid master plan might be agreed on by 2025.	S7	• Subregional platforms created to advance financing of power system connectivity projects
S3	• At least one intra-sub-regional high-level meeting by 2022 • At least one additional grid interconnection agreement for all sub-regions by 2025	S8	• Capacity building, knowledge generation and data support plans developed and resources identified
S4	• Analysis of gaps in grid policies, regulations and standards in each sub-region by 2023 • Sub-regional associations of national regulators by 2025	S9	• Set of principles to enable the assessment of interconnection projects against economic outcomes, efficiency and sustainability criteria and coherence with SDGs agreed by member States by 2023
S5	• Studies evaluating economic, energy security, social, and environmental aspects of MPT		

Milestones, activities, and questions (1…3)

S1 • Regular meetings on grid integration	**Activities** • Commission and APEF side events • EWG-EC meetings • Regulator forums	**Questions** • Regional connectivity conference? • How regularly? • How to resource?
S2 • Map regions grids by 2022 • Regional grid master plan might be agreed by member States by 2025	**Activities** • Grid mapping with GEIDCO • Connectivity modelling with TransitionZero and Stockholm Environment Institute	**Questions** • Survey of member States on existing and planned grids? • How to develop a regional grid masterplan?
S3 • At least one intra-sub-regional high-level meeting held on initiative of member States by 2022 • At least one additional grid interconnection agreement for all sub-regions by 2025	**Activities** • ASEAN meetings on connectivity • Collecting information on grid interconnection agreements	**Questions** • Intra-sub-regional forum in 2024? • Survey of member States on grid interconnection agreements? • Identification of new opportunities?

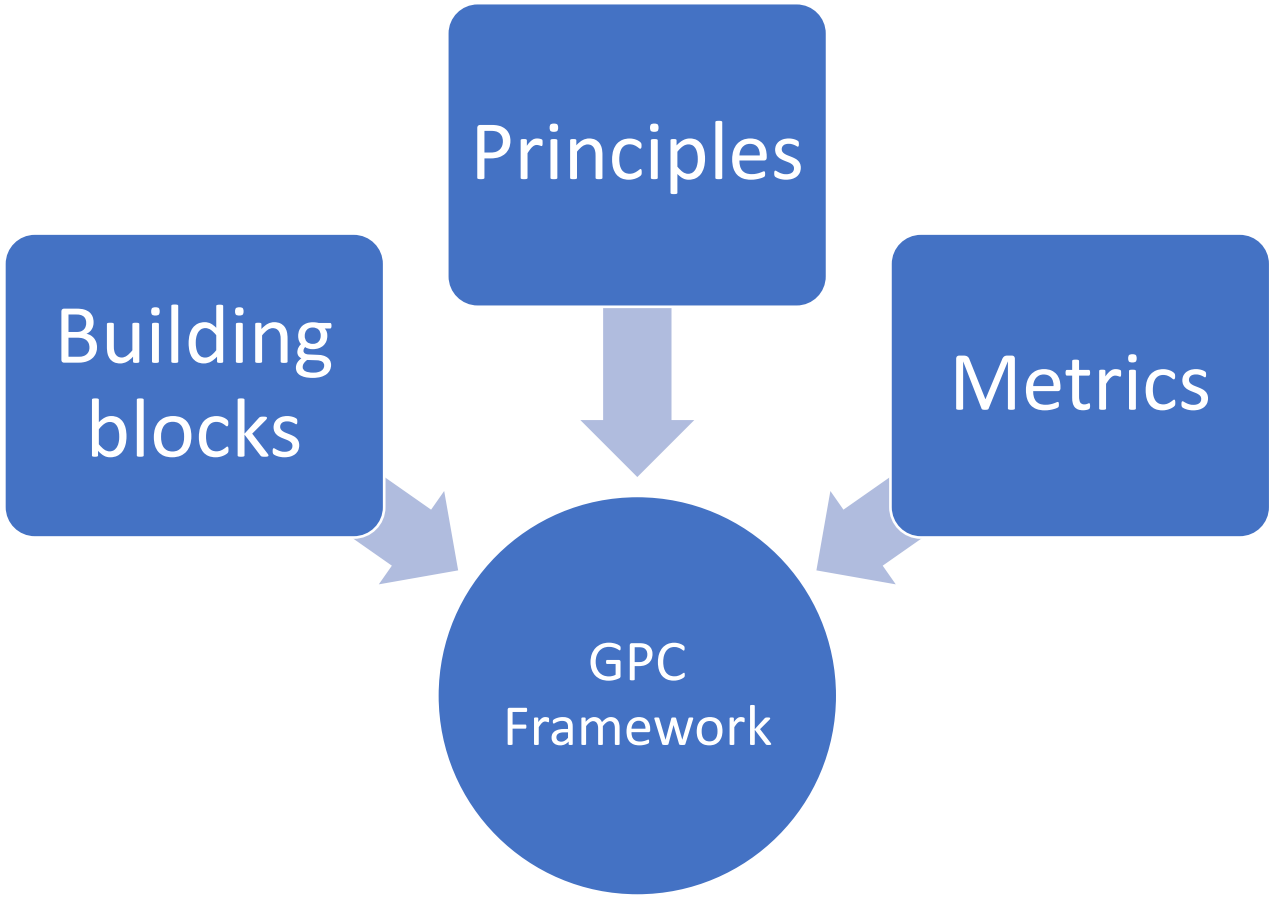
Milestones, activities, and questions (4…6)

S4 • Analysis of gaps in grid policies, regulations and standards in each subregion by 2023 • Subregional associations of national regulators formed by 2025	**Activities** • Sub-regional connectivity reports for NEA, CA, SA, and SEA • AERN, SAFIR, OPERA…	**Questions** • Regulator association for NEA? • Sustainability of existing associations?
S5 • Development of subregional and Asia-Pacific studies to evaluate the economic, energy security, social and environmental aspects of multilateral electricity trade	**Activities** • NEA GPC Roadmap (SEI) • SEA Connectivity modelling (TransitionZero)	**Questions** • Other sub-regions? • Regional study?
S6 • Establishment of coordinated mechanisms for cooperation among system operation and transmission utilities.	**Activities** • Existing of HAPUA, EPC-CIS…	**Questions** • Sustainability of existing mechanisms? • Other sub-regions?

Milestones, activities, and questions (7…9)

S7 • Subregional platforms, convening financial institutions, utilities and governments, created to advance financing of power system connectivity projects.	**Activities** • Analysis of private and climate finance for grids • Collaboration with GGI Finance Working Group	**Questions** • How to develop? • How to resource? • Who to partner with?
S8 • Capacity-building, knowledge generation and data support plans developed and resources identified to support member States.	**Activities** • Capacity building activities in SEA (with ACE, ASEC), SSWA (with SAFIR), NCA, NEA, and Pacific	**Questions** • Develop capacity building plans by sub-region? By group of institutions? • Data support – need to augment AP Energy Portal?
S9 • A set of principles to enable assessment of interconnection projects against economic outcomes, efficiency and sustainability criteria and to ensure coherence with the SDGs agreed by MS by 2023	**Activities** • Green Power Corridor Road Map for NEA • Green Power Corridor Framework	**Questions** • Further development of Framework? • Application at sub-regional level? Project level?

Green Power Corridor Framework: Components



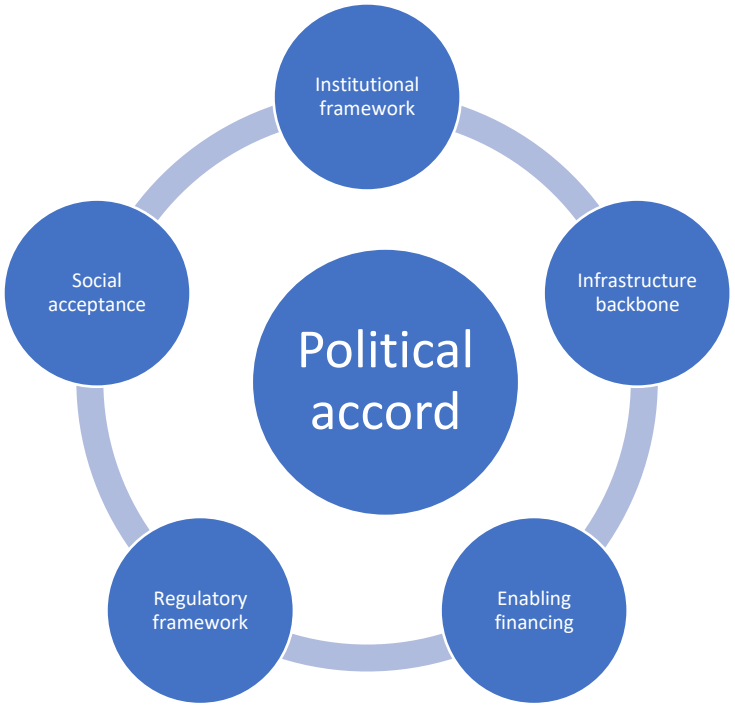
The GPC Framework includes:

- **Building blocks** to structure and orient connectivity initiatives.
- Practical and relevant **principles** to guide the development of connectivity initiatives, backed by case studies and suggested tools.
- A set of **metrics** to enable the measurement of connectivity projects against relevant criteria (under development).

Sustainable connectivity: Green Power Corridors

Green Power Corridor is a proposed framework to guide sustainable connectivity

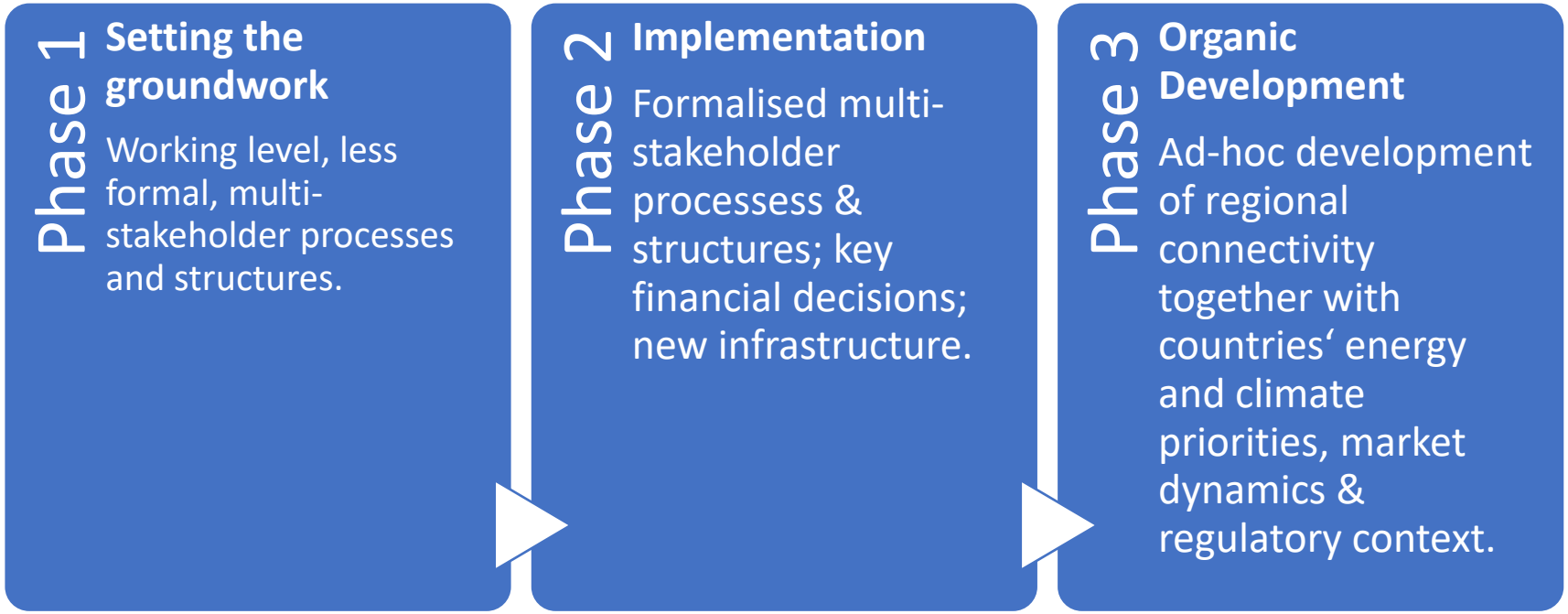
- **Political accord**: fundamental enabler of successful connectivity initiatives
- **Institutional framework:** To guide and monitor development
- **Enabling financing:** secure participation of all available sources of capital
- **Infrastructure backbone:** strengthen national and cross-border grid infrastructure to enable RE integration
- **Regulatory framework:** to enable secure, flexible and efficient operations
- **Social acceptance** : ensure public support, boost capacity, and maximize inclusion of relevant populations



Green Power Corridor Case Study: North-East Asia

- Green Power Corridor Road Map for NEA serves as a **practical application** of the Framework in a **sub-regional context**.
- **A set of incremental, time-bound and concrete steps** towards establishing an institutional & political cooperation base to support long-term development of cross-border clean power trade.
- **A long-term pathway** towards regional power grid connectivity that enables faster energy transition while boosting economic growth & energy security.
- **Modelled impact of different connectivity scenarios** (Asian Super-Grid, NAPSI, NEAEI, plus a synthesis case) on decarbonization efforts

Implementing Green Power Corridors



* ***Political agreement needed in principle to facilitate implementation, ensure sustainability and stakeholder alignment, attract investment, etc.***

Accelerating progress in GMS and South-East Asia

- **Many of the key building blocks are in place:**
  - Political will
  - Supportive institutions (ACE, HAPUA, AERN, ASEAN Secretariat,)
  - Regional grid plan (AIMS III)
  - LTMS-PIP
- **To accelerate progress:**
  - Increase capacity in supportive institutions
  - Enable more cross-border infrastructure development through increased transparency, harmonization, and innovative financing.
  - Regular and more harmonized grid planning
  - Develop pilot project for full multilateral power trading

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