

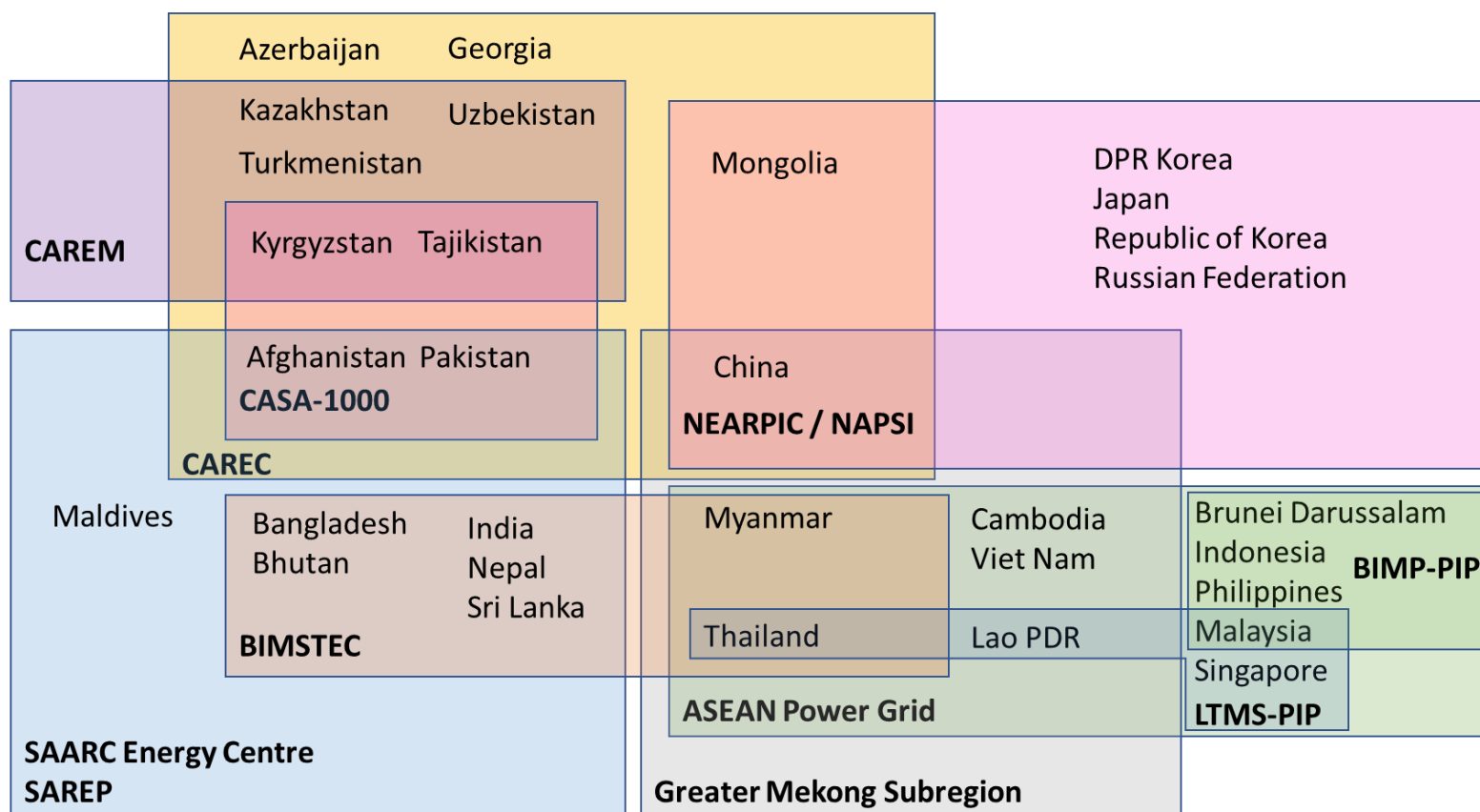
Green Power Corridor Framework

Accelerating Progress on the ASEAN Power Grid 2.0: Lessons from the LTMS-PIP and Beyond

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Cross-border energy connectivity initiatives in APAC

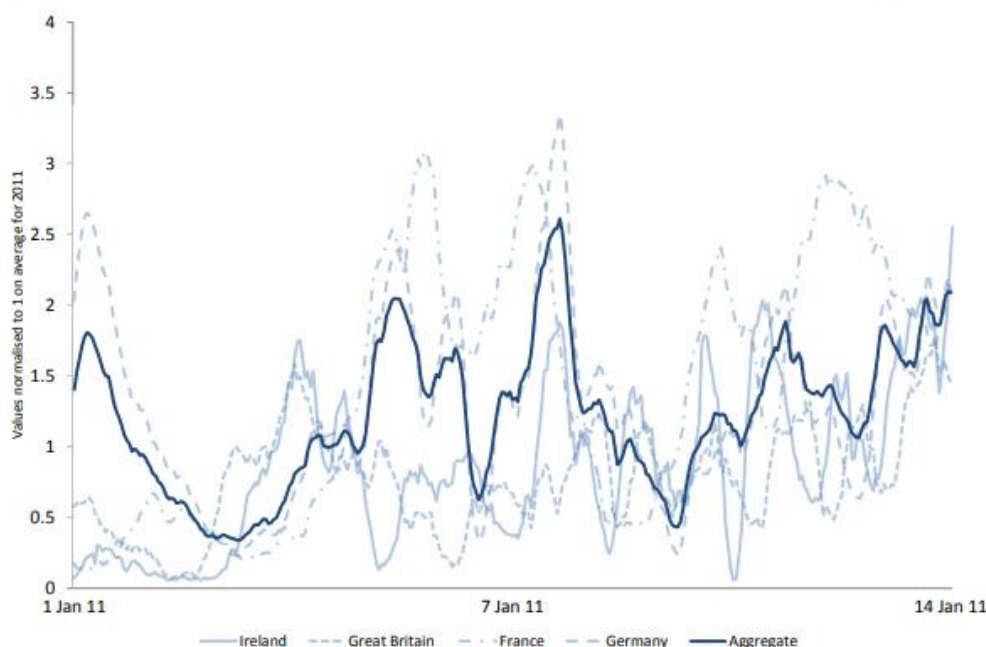


- Many power system connectivity initiatives in Asia-Pacific, mostly subregional.
- Grid infrastructure development and power trading mainly bilateral.
- Political will and enabling institutions are the key drivers of connectivity initiatives at subregional level
- No common approach to grid planning or system operations at regional level

The need for larger, more integrated power systems

Power system connectivity is a tool that can **lower costs, improve energy security, and enable decarbonization**

Figure 11. Variability of wind output for four European countries, 1 January to 14 January 2011



Source: Seamless Power Markets (IEA, 2014)

ESCAP's Regional Roadmap on Power System Connectivity

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)

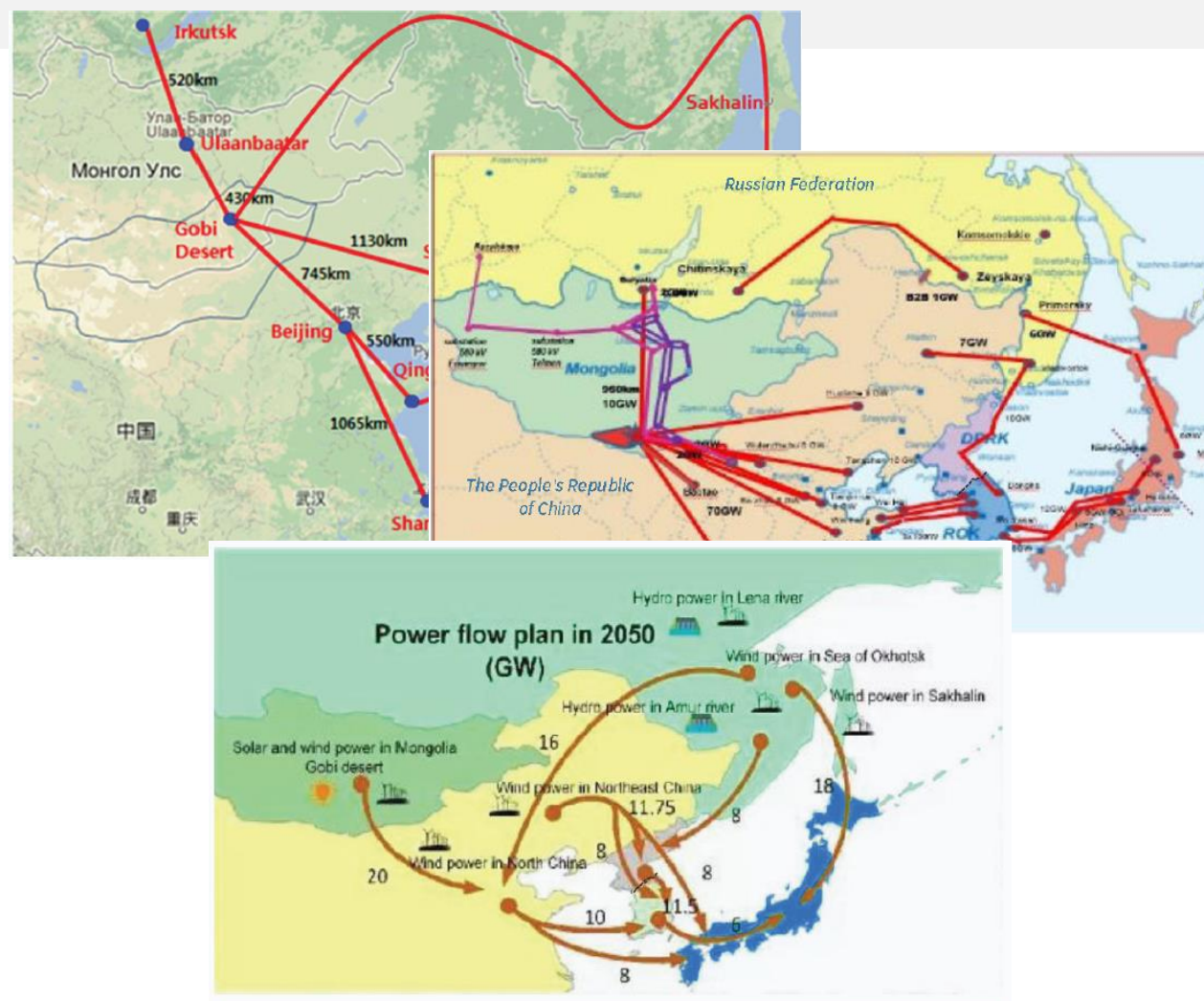
Cross-cutting

- 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)**

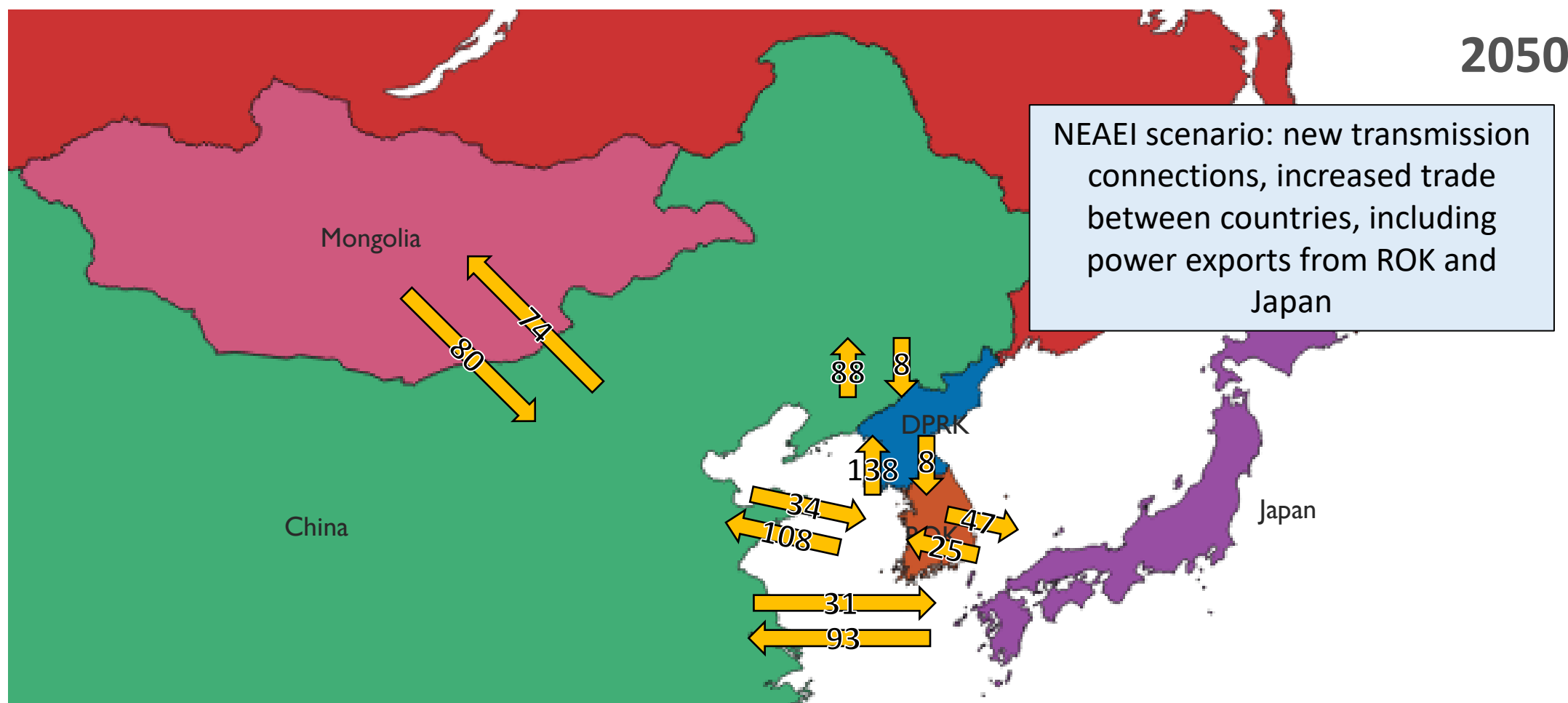
Multilateral power trade is a tool for decarbonization

Case Study: Green Power Corridor Roadmap for North-East Asia

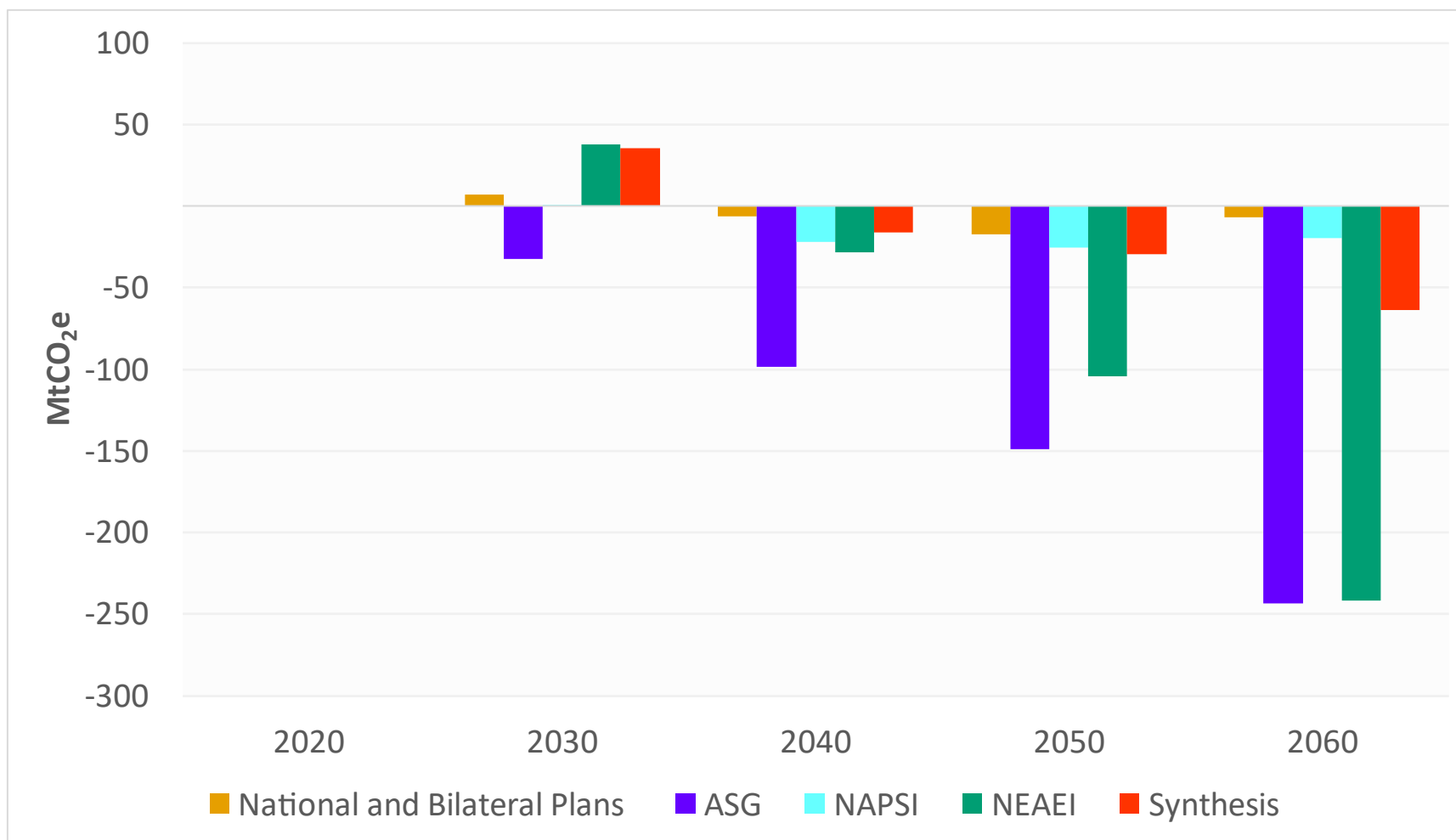
- **Assumed RE deployment and decarbonization goals are met (e.g. net-zero emissions in Japan and Korea by 2050, in China by 2060)**
- **Modelled impact of different connectivity scenarios (Asian Super-Grid, NAPSI, NEAEI, plus a synthesis case) on decarbonization efforts**



Multilateral power trade is a tool for decarbonization



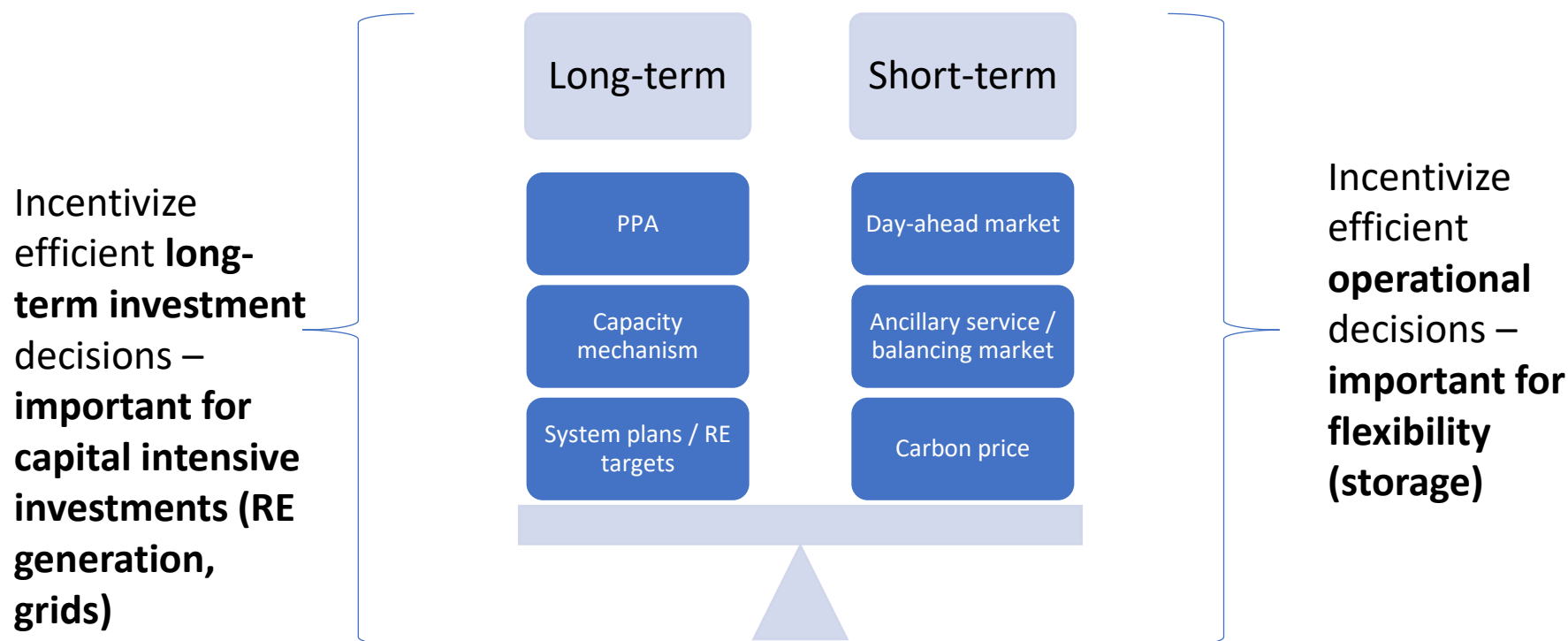
Multilateral power trade is a tool for decarbonization



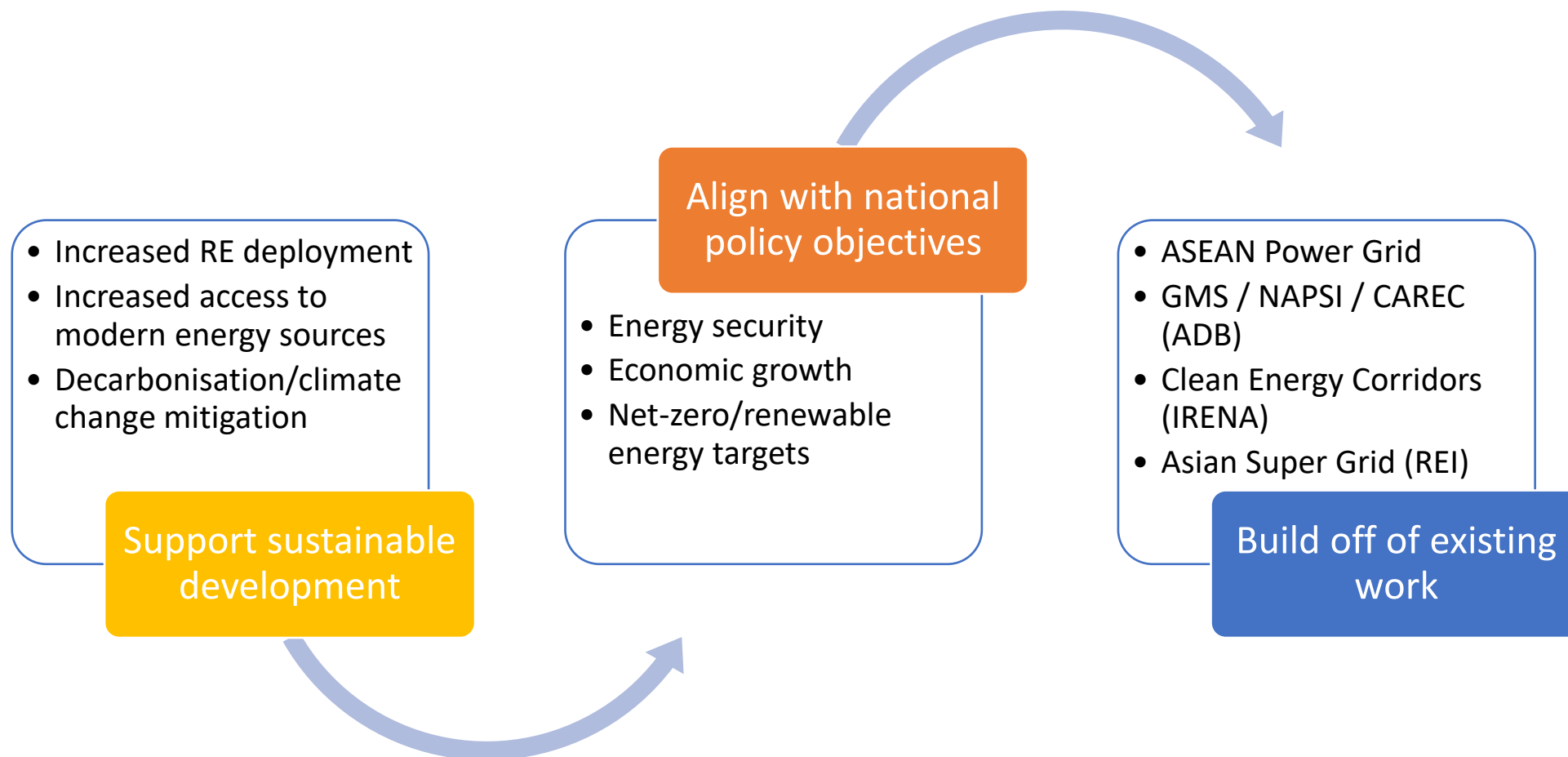
- Significant emission reductions due principally to avoided coal generation
- Benefits increase with time as new wind and solar are deployed

MPT: the role of market signals

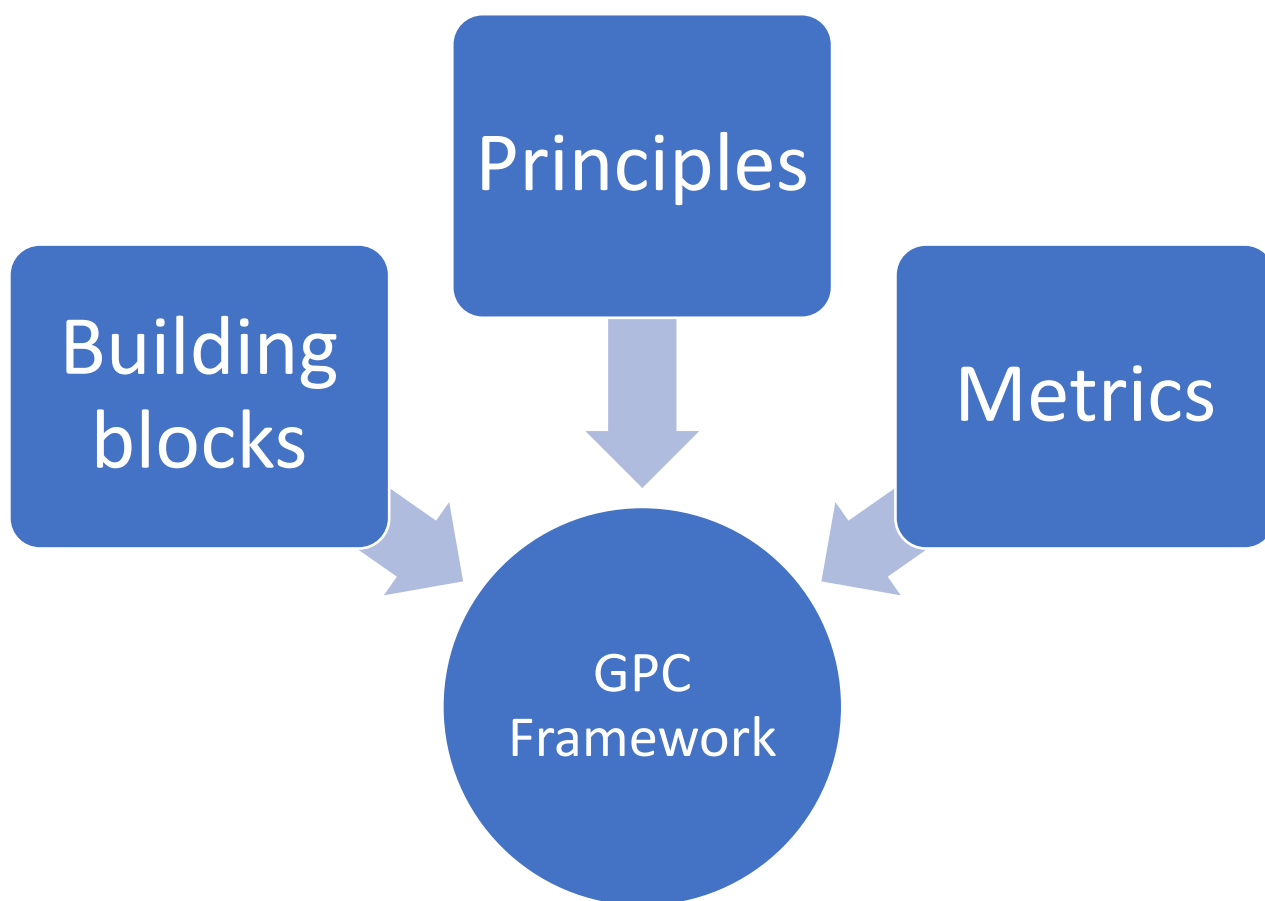
- Encouraging investments in low-carbon technologies requires an appropriate balance of *long-term* and *short-term* market signals



Green Power Corridors



Green Power Corridor Framework: Components

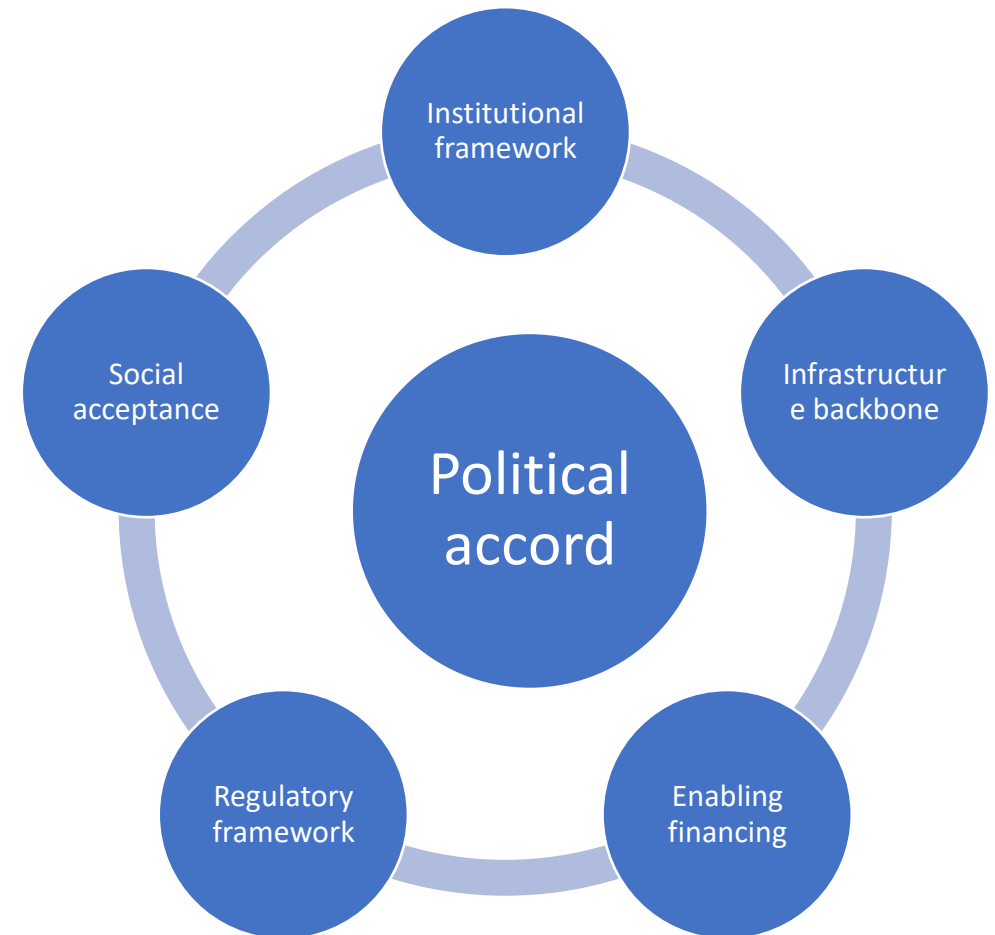


The GPC Framework includes:

- 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).

Green Power Corridor Framework: Building Blocks

- **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.



Example Building Block: Regulatory framework

- Develop harmonized grid codes that enable secure and flexible operations;
- Enable bilateral cross-border power trading arrangements through harmonized and coordinated procedures;
- Establish multilateral trading arrangements that emphasize flexible and lowest-cost trading of electricity backed by a transparent pricing mechanism, including power, transmission tariffs and losses;
- Develop appropriate and consistent cost-sharing and cost recovery mechanisms.

Models of power system integration and trading arrangements

Nascent	Bilateral, unidirectional power trade	Sichuan exports to eastern coastal regions
Nascent	Bilateral, bidirectional power trade	Seasonal exchanges between Sichuan↔Shaanxi, Qinghai ↔Tibet, China↔Lao
Secondary	Multilateral, unidirectional power trade with intermediary	Lao People's Democratic Republic-Thailand-Malaysia-Singapore (LTMS) Power Integration Project
Secondary	Multilateral, multidirectional trade among differentiated markets	- Southern African Power Pool (SAPP) - Central American Electrical Interconnection System (SIEPAC)
Primary	Unified market structure, differentiated operations	EU Internal Electricity Market
Primary	Unified market and operations	PJM (Northeastern United States)

Source: <https://www.iea.org/reports/building-a-unified-national-power-market-system-in-china>

IEA. CC BY 4.0.

Regulatory
framework

Relevant ESCAP reports



Enhancing cross-border power system connectivity to enable increased energy security and net-zero emissions: note by the secretariat



(Includes draft GPC Framework)



Regional Power Grid
**Connectivity for
Sustainable Development**
in North-East Asia

Policies and Strategies





ESCAP

Economic and Social Commission
for Asia and the Pacific