

Supporting Gobitec & Asian Super Grid through Asian Energy Highway

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**United Nations Economic and Social Commission for Asia and the Pacific
(ESCAP)**

Ulaanbaatar Energy Charter Forum

**Developing Renewable Energy across Gobitec & Asian Super
Grid in Northeast Asia**

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Challenges

Asia-Pacific energy demand is projected to grow by 2.4% a year for the next 20 years - highest growth in East Asia at 4.8% and South Asia at 3.5%

Consumption Intensity

Between now and 2050, Asia will be transformed as its urban population nearly doubles from 1.6 billion to 3.1 billion

Asia is projected to surpass the OECD before 2030 to become the world's largest energy consuming block

Resource Distribution

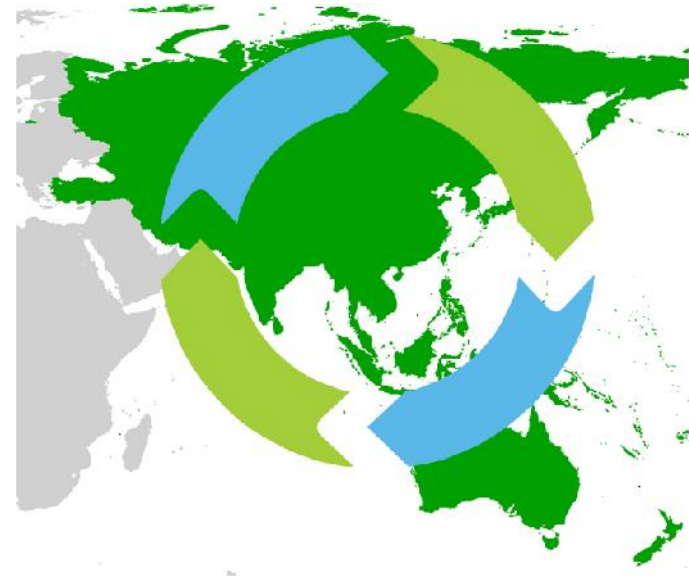
The uneven distribution of energy resources within the Asia-Pacific is presents a variety of challenges at the national level in terms of supply security

Opportunity

- Energy trading is currently occurring within the Asia-Pacific region however it is primarily limited to bilateral agreements between neighboring states
- **Regional Integration.** The economically sound allocation of energy resources is likely to be more efficiently accessed and distributed using regionally integrated energy planning and trading

Some sub-regional recognition of need for greater cooperation:

1. ASEAN Power Grid and Energy Market Integration
2. SAARC Energy Ring and Market for Electricity
3. CASA 1000 and Central Asia-South Asia Regional Electricity Market
4. Greater Mekong Subregion Power Market
5. North-East Asian Super Grid and Gobitec
6. Unified Energy System of Central Asia



Asian Energy Highway

- ESCAP Promotes Regional Cooperation for Energy Security and Sustainable Development
- In its 68th Commission Session in May 2012, member States adopted a Resolution (68/11) **to enhance regional energy security through by improving efficiency, connectivity, and promoting a greater share of renewable and clean energy for a more sustainable future**

Concept

- Promote regional integration of electricity infrastructure and harmonization between institutions
- Enhance resource security through diversity of supply
- Enable a capacity for regional load planning and balancing, thereby increasing efficiencies in resource consumption
- Progress towards a regionally integrated and competitive electricity marketplace

ESCAP Resolution--Connectivity for energy security

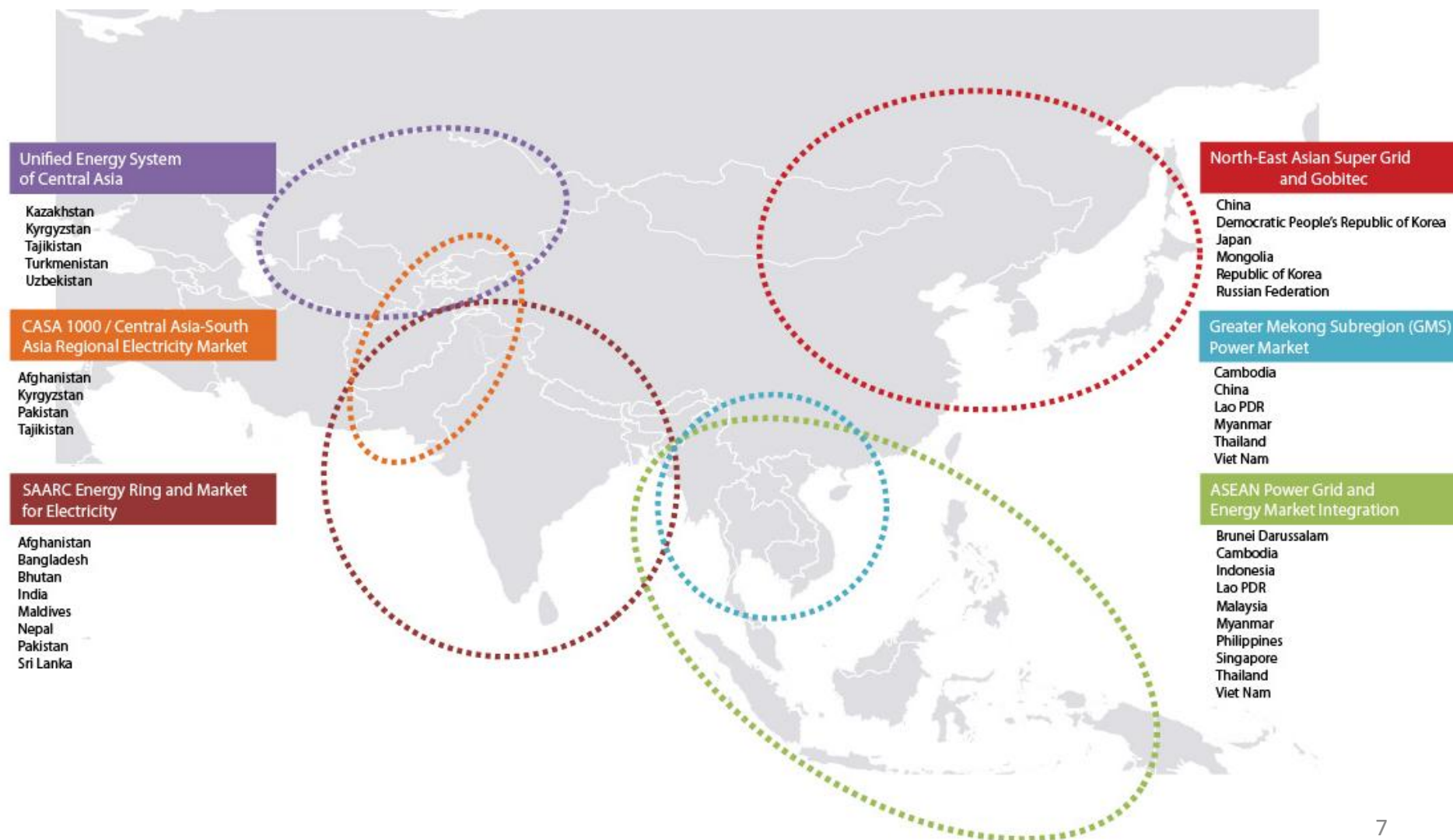
Main activities

- **Identify options, in consultation with member States, that member States may choose on regional energy connectivity, including an intergovernmental framework that could be developed for an integrated regional power grid, which could be termed as the “Asian Energy Highway (AEH)”**
- **Analyze the socioeconomic and environmental benefits of each option as well as the challenges and opportunities towards the realization of each option**

Progress so far

- Concept integrated in Asia-Pacific regional cooperation framework for energy
- **Analytical work started**
- Expert Group Meeting on Conceptualizing the AEH
- **Policymakers request benefits study**
- further identify and quantify the socio-economic and environmental benefits of an AEH
- **Subregional approach adopted**

Subregional Initiatives on Power Grids and Electricity Markets



Russia

Kazakhstan

Uzbekistan

Turkmenistan

Kyrgyzstan

Tajikistan

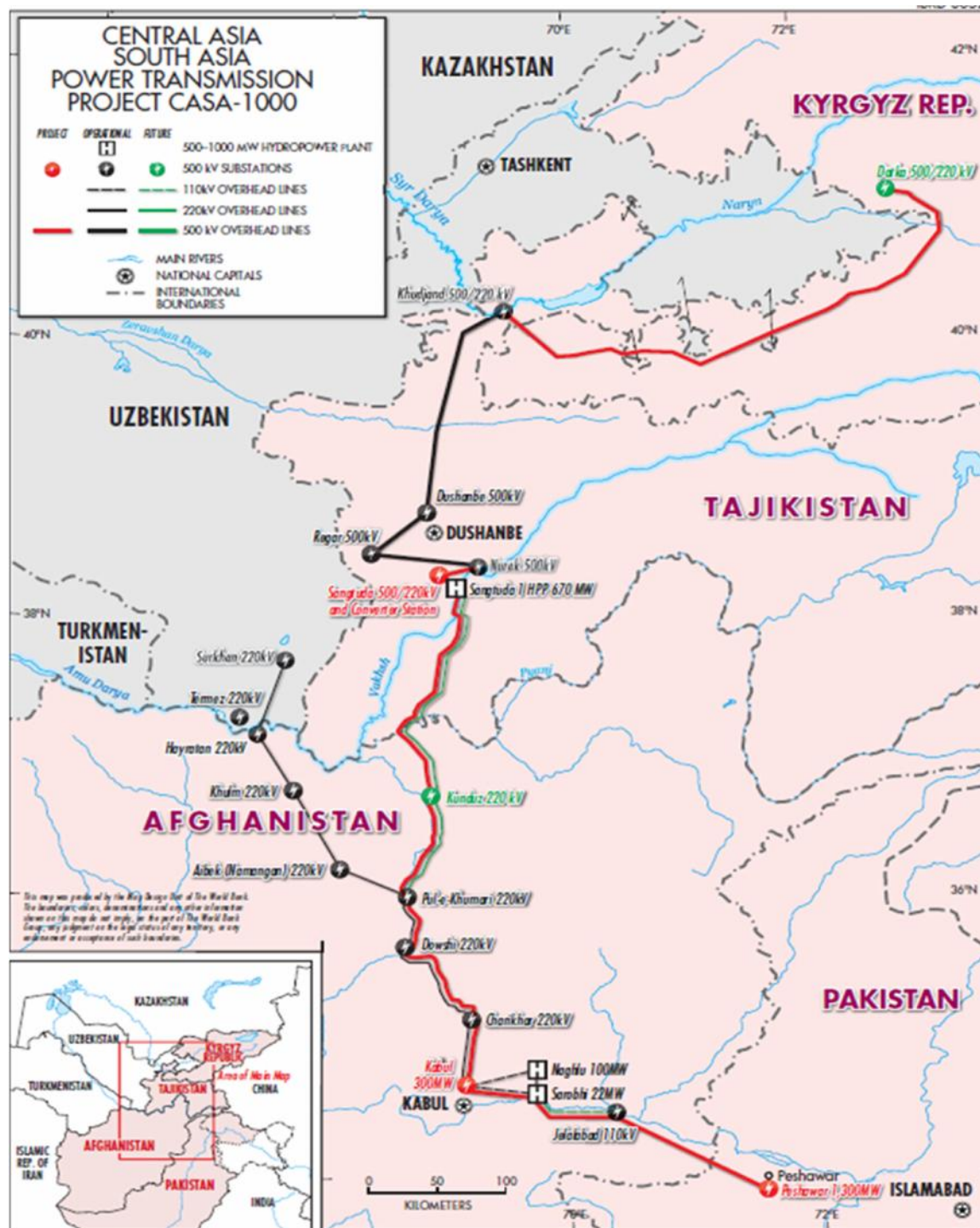
Afghanistan

Iran

China

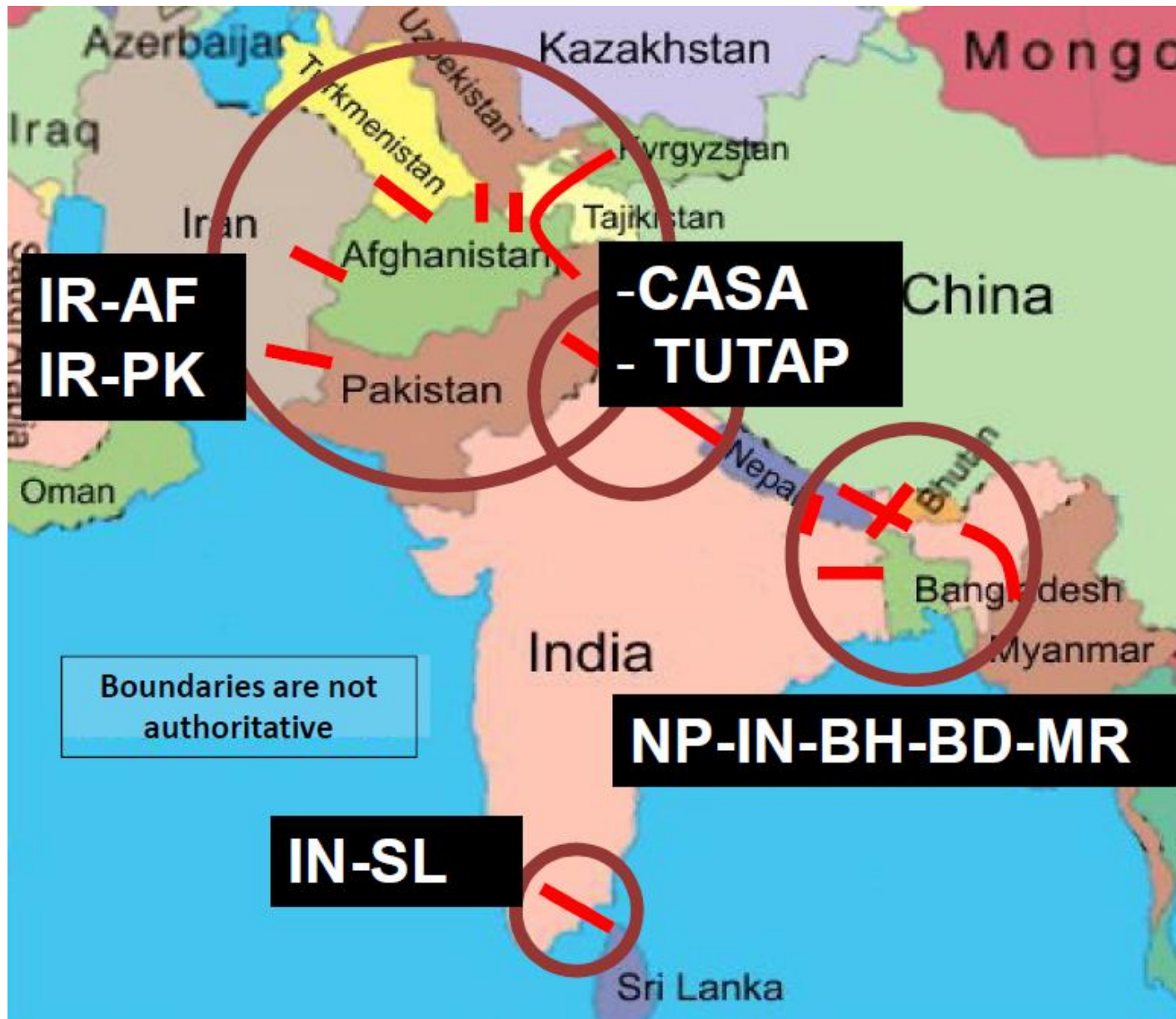
Legend

- 1150 kV Transmission Lines with Substations
- 500 kV Transmission Lines with Substations
- 220 kV Transmission Lines with Substations
- 110 kV Transmission Lines with Substations
- 500 kV Transmission Lines under construction or planned
- 220 kV Transmission Lines under construction or planned
- 110 kV Transmission Lines under construction or planned
- 220 kV Railway Substations
- Thermal Power Plant
- Hydroelectric Power Plant
- Thermal Power Plant under construction
- Hydroelectric Power Plant under construction
- GRES Thermal Rayon Power Plant
- APS Atomic Power Station
- CHPP Combined Heat and Power Plant
- HPP Hydroelectric Power Plant
- SS Substation
- MSDSS Master Step-down Substation
- PS Substation serving Pump Station

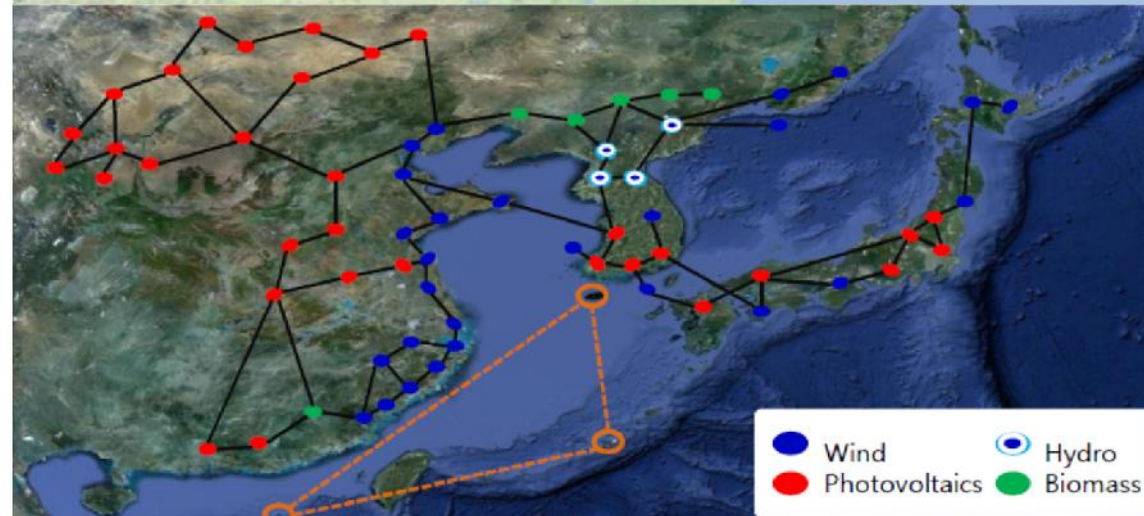


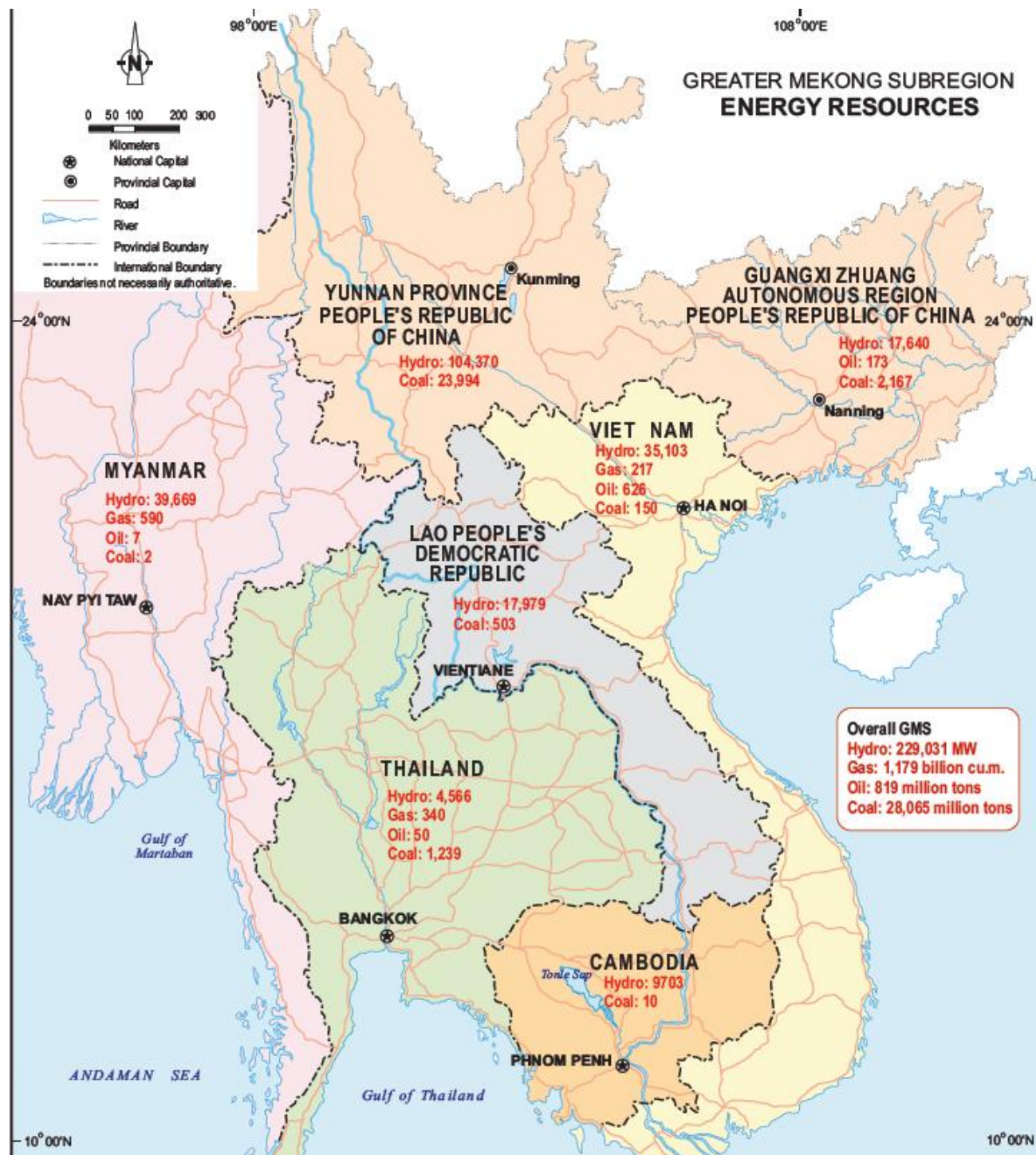
CASA 1000: Flagship Project of Central Asia- South Asia Regional Electricity Market (CASAREM)

SAARC Energy Ring's power grid



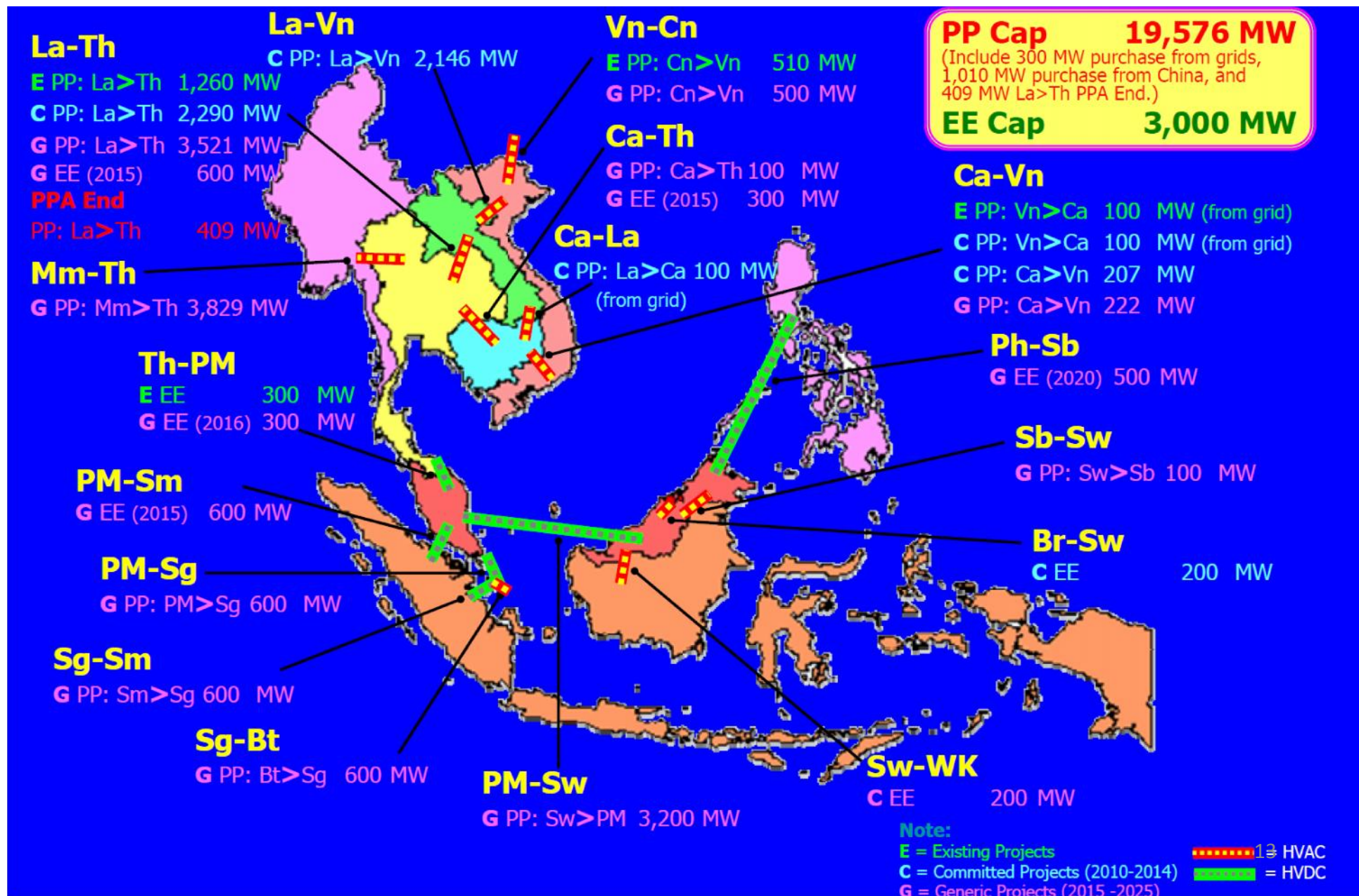
Northeast Asian Super Grid & Gobitec





Greater Mekong Subregion Power Market

ASEAN Power Grid



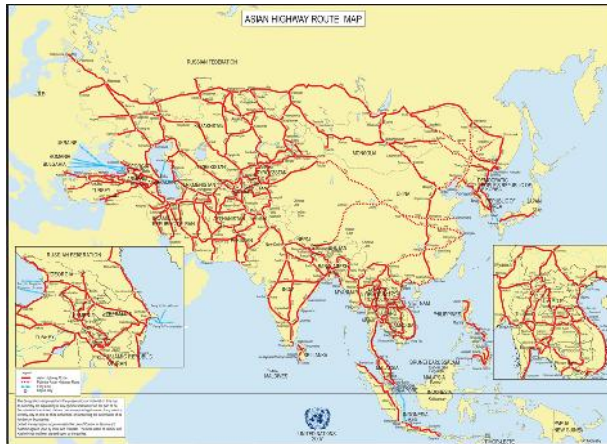
Way Forward

- **The potential to integrate both the production and distribution of electricity within the Asia-Pacific is limited only by political will, cooperation, and the investigation and realization of economically sound planning.**
- **Regional coordinating bodies are likely to deliver the organizational and management structure necessary to implement such a concept**
- **Facilitate cooperation between subregional initiatives on power integration**
- **Develop consortium to undertake cost-benefit analysis on Asia regional scale**

“The present available AC and DC transmission technologies for OHTL’s, underground and sea cables, stations and auxiliary systems do not pose practical limits to interconnections: **the main limits are political, regulatory, financial and in an increasing number of cases especially in developed countries are the environmental impact and local opposition.”**

WEC, 2010

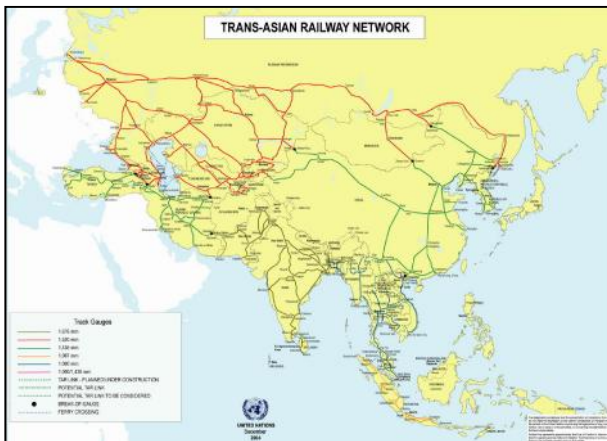
Asian Energy Highway (cont)



Precedence for regional connectivity exists:

Asian Highway Network

Extends through 32 member states and comprises 142,000km of highways



Trans-Asian Railway Network

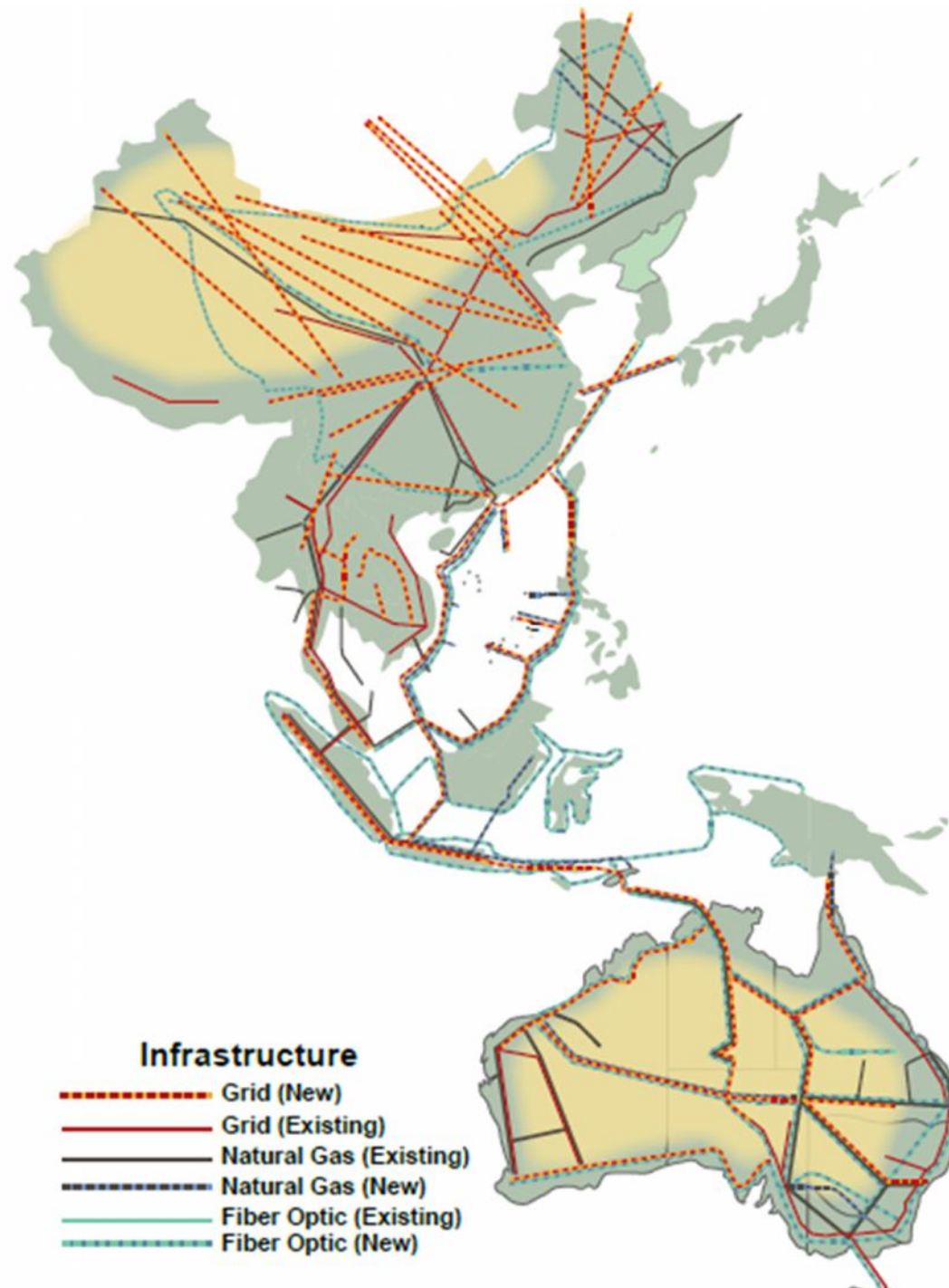
Inter-Governmental Agreement on the Trans-Asian Railway Network entered into force in 2009

ESCAP's Role & Plan

ESCAP can play a valuable role in promoting the exchange of knowledge and wider application on good practices, which, importantly, will:

- **Improve performance of each subregional initiative**
- **Build trust among countries, subregions and organizations**
- **Platform for intergovernmental process**
- **Establish a better foundation (relationships, standards, institutions, etc.) for future integration**

Vision of the Asian Energy Highway



Source: GRENATEC