

Cross-Border Power Transmission Opportunities and Challenges



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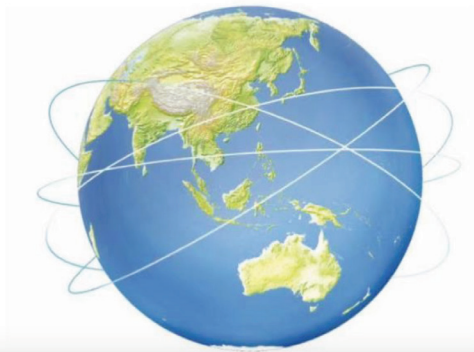
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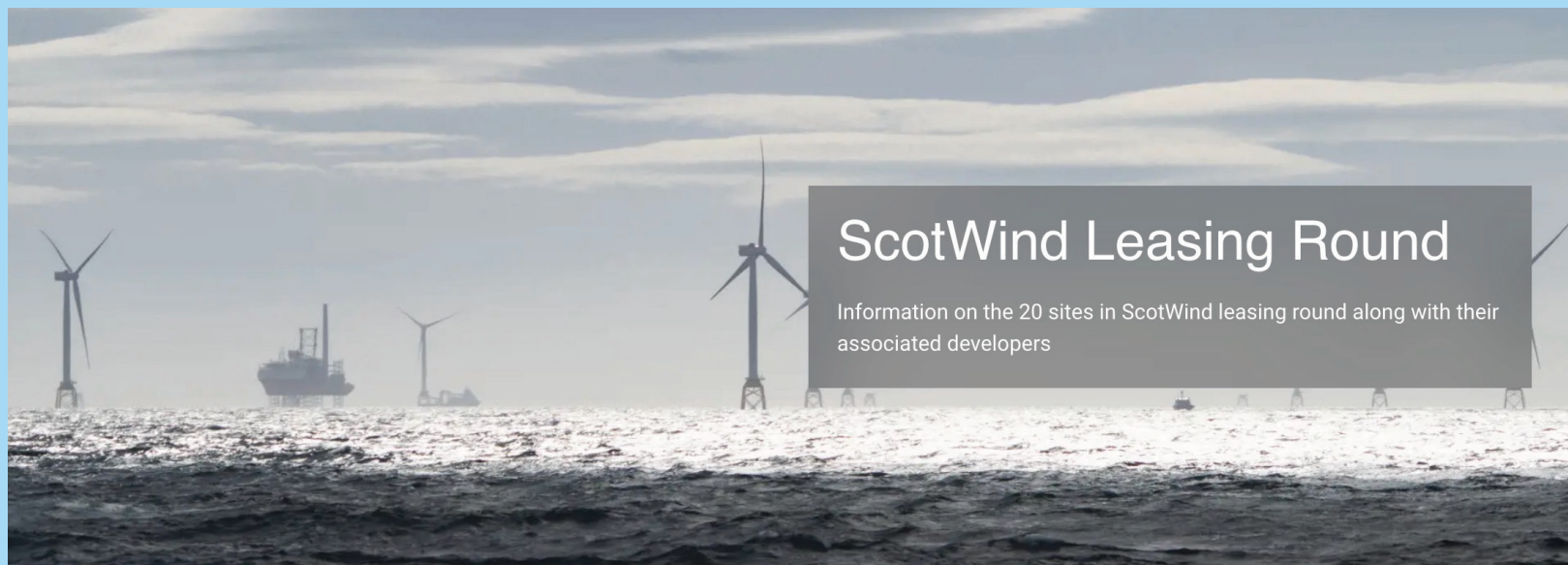
Advanced Power Transmission Forum
Global Energy Interconnection Conference
Beijing, China, 27 Sep 2023

Research and Outlook on Asian Energy Interconnection

Global Energy Interconnection Development
and Cooperation Organization



Some Case-specific Examples
Opportunities and Challenges

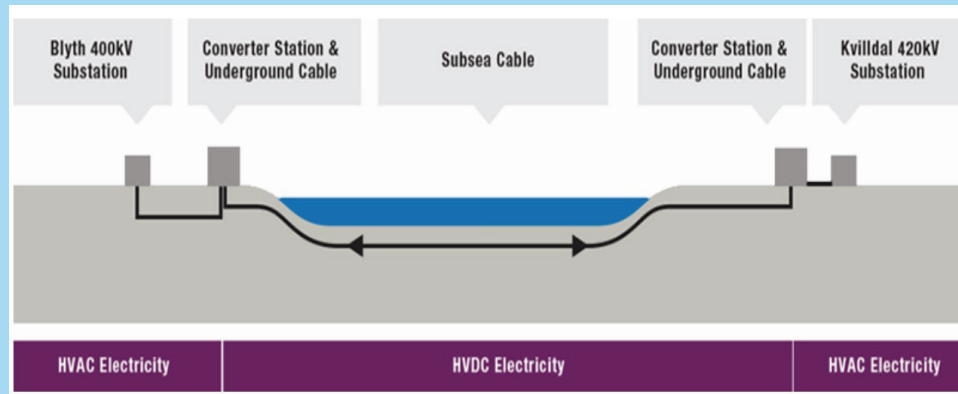


ScotWind leasing round on the 17th of January 2022: **25 GW**

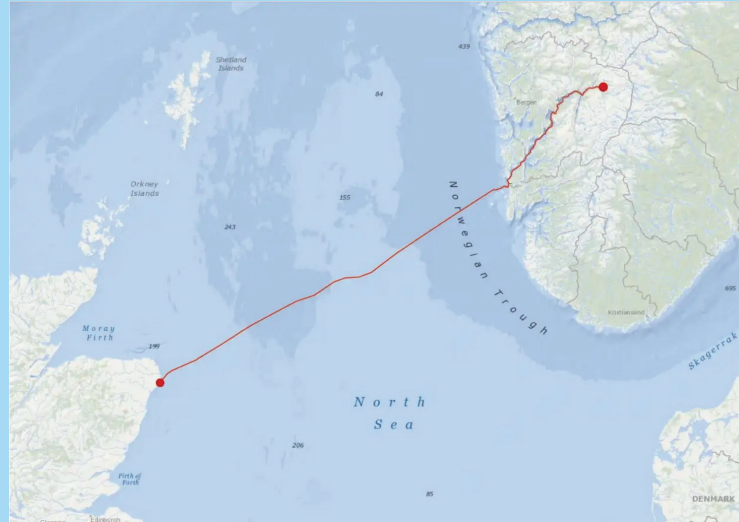
Demand for Electricity in Scotland in 2030: **6 GW**

LONDON, Aug 24 (Reuters) - British authorities have given planning consent for a new 2 gigawatt (GW) subsea power link between Scotland and England

The Eastern Green Link 2 will be developed by National Grid and Scottish and Southern Electricity Networks Transmission.



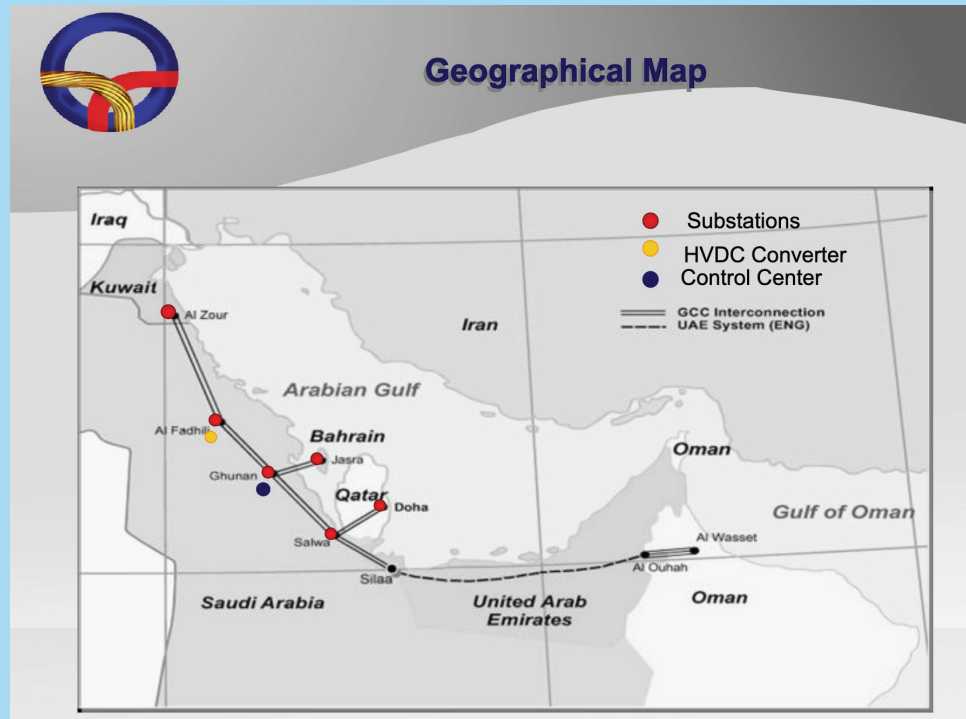
The 1400 megawatt interconnector stretches from Blyth in the UK, across the North Sea, to Kvilldal in Norway.



The NorthConnect project was meant to build a 1.4 GW undersea interconnector between Norway and Scotland. This 665-kilometer hybrid electric cable would have allowed exchanges between Scottish wind power and Norwegian hydropower

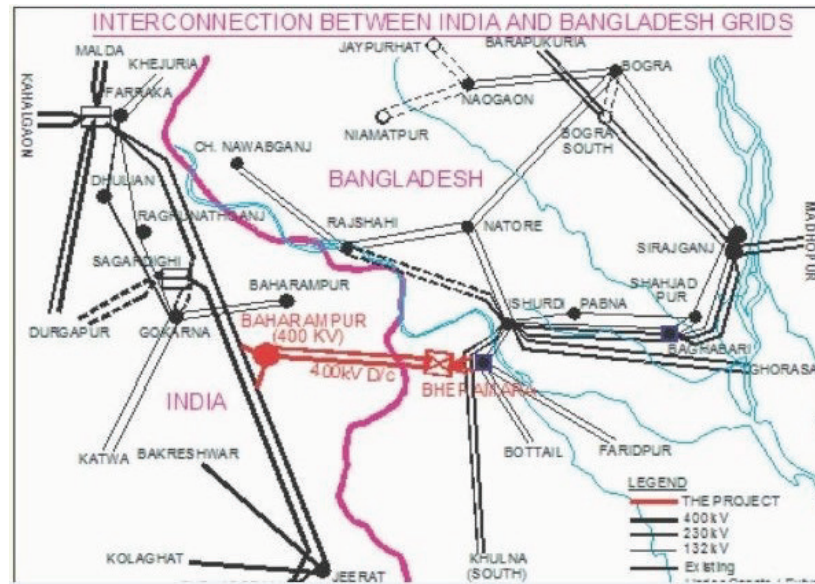
Not approved: Uncertainty of exposure to Norway's power grid to energy systems of other countries

Gulf Coordination Council Interconnection



Major Benefit: Reduction of Reserve Requirements
Also helpful in dealing with Intermittent sources (PV)

Bangladesh-India Interconnection (HVDC link)



Bangladesh-India 400 KV Double-Circuit 1,000 MW Line

Allows Bangladesh to buy cheaper electricity
and solar electricity when available

Back-to-back HVDC Stations installed for stability due
to Grid Code incompatibility

USD 400 Million investment could have been avoided
with a compatible Grid Code

Similar Grid Code incompatibility exists between
US and Mexico

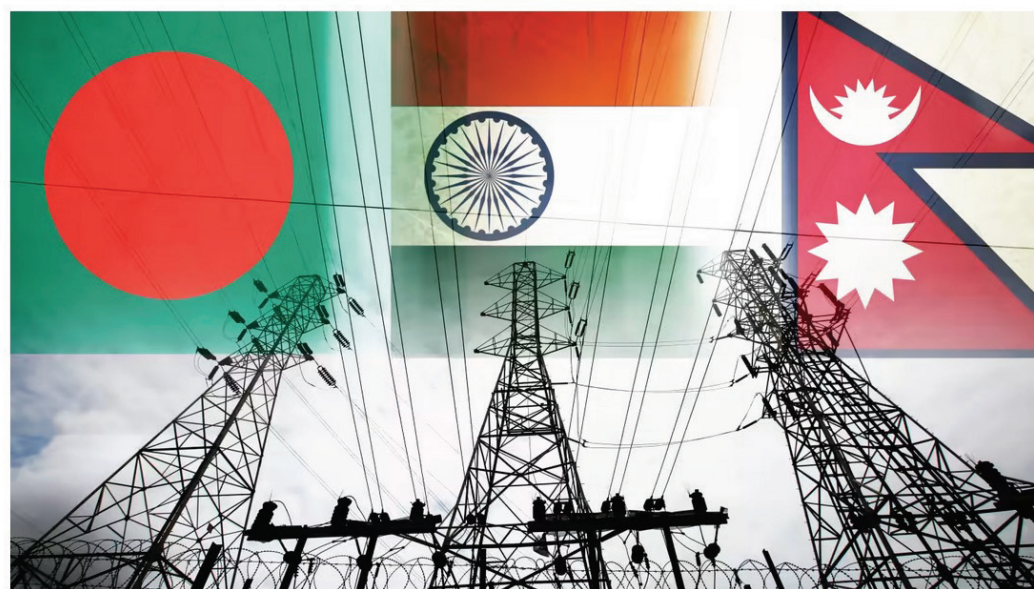
Nepal, India reach 'milestone' deal on trade, transmission of electricity

Nepal to be permitted to participate in real-time trade in the Indian market, an upgrade from existing day-ahead energy trade.



Import of Hydropower will Reduce
India's Dependency on Coal-fired
Power Stations

Source: Kathmandu Post



Bangladesh, India and Nepal are expected to soon finalize an agreement that would allow power sharing across Indian transmission lines. (Source photos by AP and Reuters)

Nepal needs to attract investment by developing a market outside
Nepal needs less electricity in summer than in winter
It is opposite in India and Bangladesh due to high air conditioning load

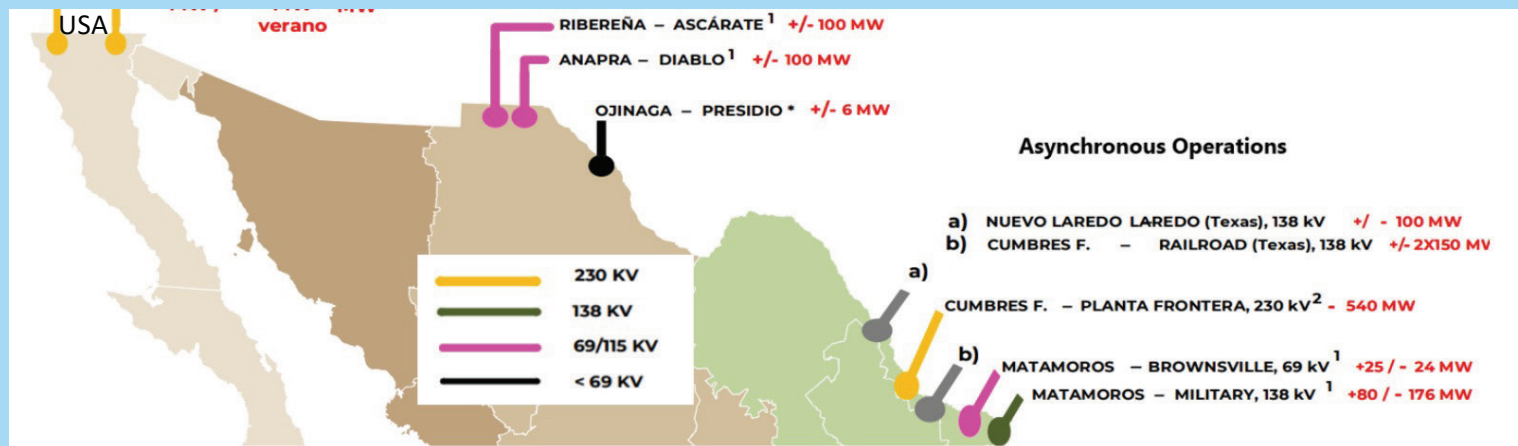
Low-carbon, cheaper and non-intermittent electricity

Champion Hudson Power Express: 1250 MW
(Quebec to New York City)

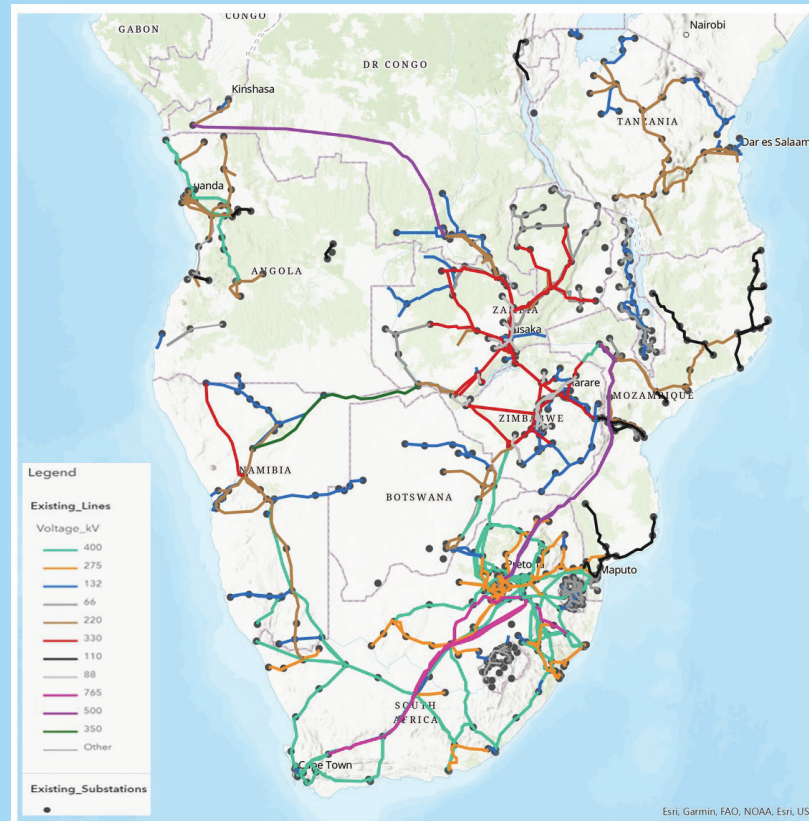
545 km of underwater-underground transmission line
from Québec, Canada to New York City, about 500 km in NY State

Industry tends to locate in areas of low-carbon electricity to help meet their own net-zero targets for scope II and scope III emissions

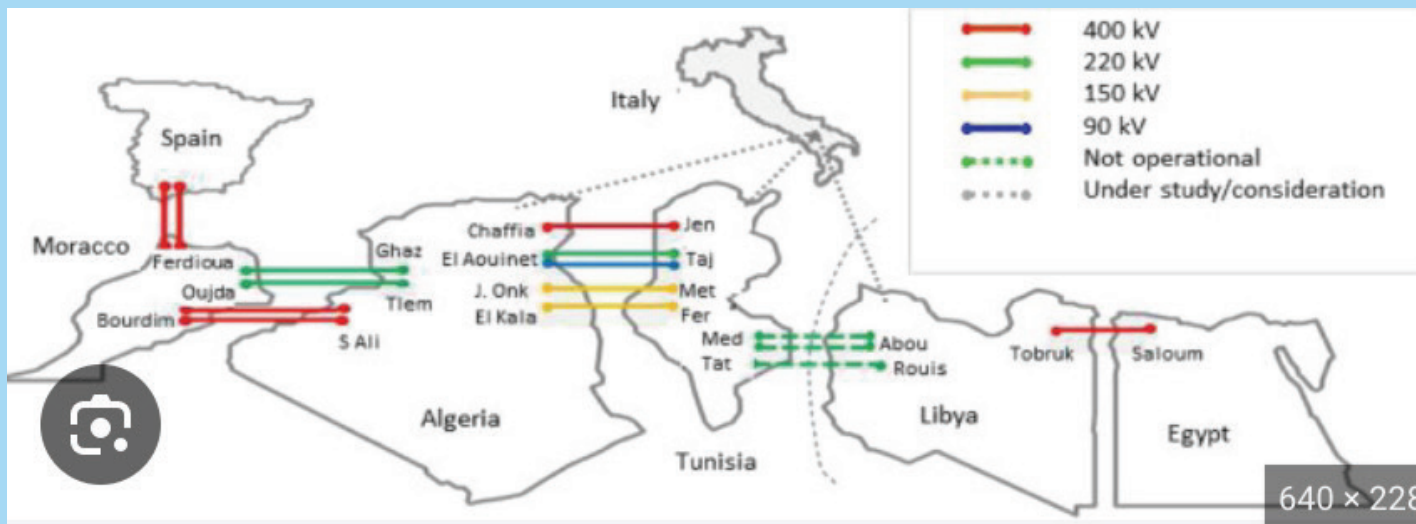
Vietnam has opted to boost hydroelectricity imports from Laos. Particularly, the limited electricity transmission capacity from the South to the North poses a major challenge. It is easier to import hydro electricity from Laos to shore up power supply for the North, given the shorter transmission distance.



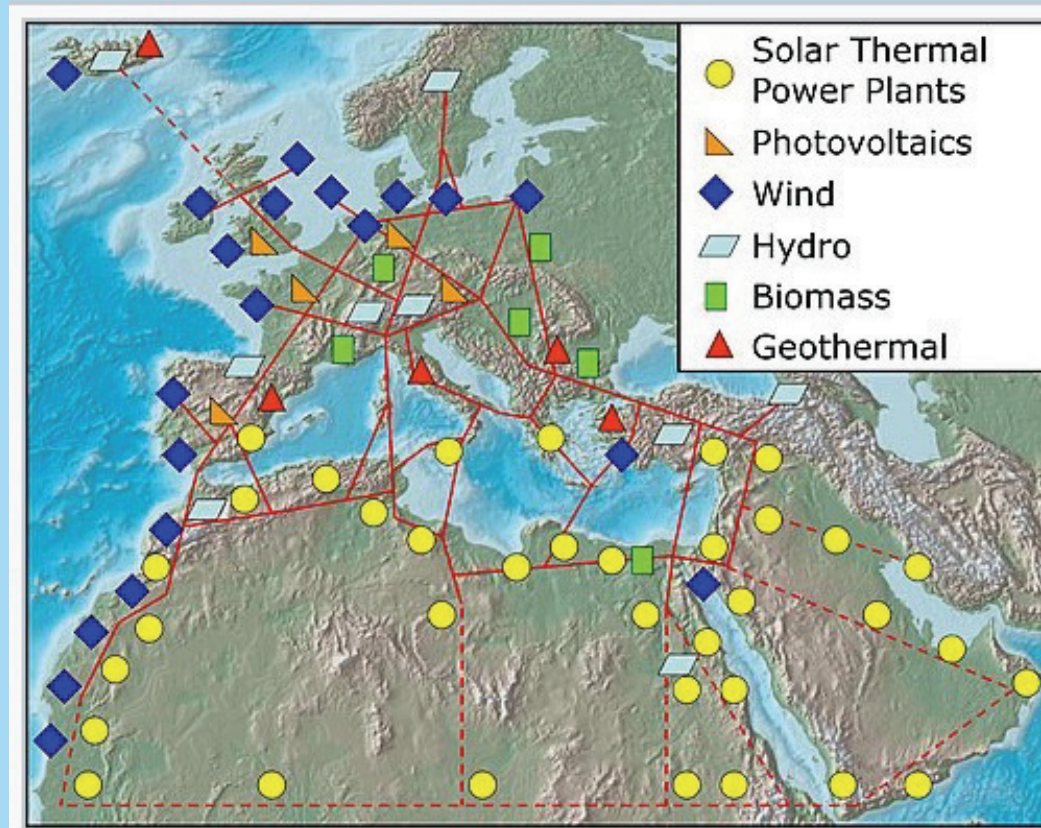
Flow of electricity from California (USA) to Baja California (Mexico)



Southern Africa Power Pool (14 countries)
 Inadequate power transfer capacity



North Africa Power Pool (5 countries)



European Super Grid (conceptual)

Challenges

Geopolitics
National Security
Funding
Technology

How Can GEIDCO Contribute ?

1. Sharing information about best practices
2. Engage with local engineers/consultants through IEEE sections
3. Help bridge the technology divide
 - Help develop 'deployable' Grid Codes
 - Work with host country engineers on Grid Codes



Thank you

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