

Delivery date: September 21, 2022

TRANSMISSION 3

GLOBAL DREAMS

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We have come a long way from Thomas Edison's insulated underground cables transmitting direct current (at just 110 V) from his pioneering Pearl Street station in New York in 1882. China's most powerful UHV-DC line of 1,100 kV carries 12 GW from Xinjiang to Anhui, about as far (3,324 km) as from Yellowstone National Park to New York (and about 20% further than the flight distance from Sapporo to Taipei). China has a growing national grid, in Eurasia it is theoretically possible to transmit electricity from the Baikal region (south-central Siberia) to Portugal (a flight distance of just over 8,000 km), and construction is now underway to link Greek, Cypriot and Israeli grids by the world's longest (about 1,200 km) HV-DC submarine cable.

Much bolder proposals have been around for some time. The Global Energy Network Institute (GENI) has been promoting the idea of worldwide electricity grid for decades. North America would be linked with Asia across the Bering Strait, Europe and North America by HVDC cables between Scotland,

Iceland, Greenland and Labrador, while North and South America would be linked by two connectors, one along their western coasts, the other one via the Caribbean, and Australia would be linked with Asia via Malaysia, Sumatra, Java, Timor and Papua. The European Commission has been very active in researching long-distance HVDC proposals and its studies include a European supergrid for renewables (2011), a connection between North Africa and Europe (2013 and 2014), China and EU (2017), Europe and North America (2018) and Europe and Central Asia (2020).

And China, not content with its domestic success, tried to stake out a global position: in 2016 the Chairman of China's State Grid Corporation released the company's proposal to build a worldwide wind and solar power grid by 2050 at the cost of \$50 trillion. The statement that it was to connect proposed wind farms at the North Pole with solar farms at the equator betrayed the proposal's lack of seriousness: The North Pole is hardly a desirable place to locate giant wind turbines, and the world's sunniest places are subtropical deserts, not equatorial climates! And even the best possible and technically flawless supergrid proposals must reckon with many non-technical realities that militate against grid expansions. These range from realistically appraised costs to political realities. In 2022, with Russia's war on Ukraine and with America's new-found wariness of China, it seems highly unlikely that we will see any megaproject binding the US, Russia, China and Europe.

GENI Global Energy Grid

<http://www.geni.org/globalenergy/issues/overview/grid.shtml>

EU grid studies:

[Transcontinental and global power grids | JRC Smart Electricity Systems and Interoperability \(europa.eu\)](#)

(Disclaimer: The views and impressions in the columns are personal opinions of Prof. Smil and do not represent the opinions of ICEF.)