

Macro Grid Initiative

An **ACORE** Program

THE BENEFITS OF HIGH-VOLTAGE TRANSMISSION IN A COMPETITIVE GLOBAL ECONOMY

Investing in a modern high-voltage transmission system will unlock the lowest cost, cleanest American electricity resources, benefiting households and businesses across the country.

U.S. COMPANIES NEED ACCESS TO RELIABLE, COST-COMPETITIVE ELECTRIC POWER

Antiquated transmission infrastructure and a balkanized electric grid are limiting the nation's ability to meet changing demands on the electric system. Other countries and regions are modernizing their transmission systems, building high-voltage Macro Grids that lower energy costs, improve resilience and effectively integrate growing levels of pollution-free renewable energy.¹ The U.S., rich in renewable resources and technological know-how, is falling further behind each year it delays investment.

"It will be critical for transmission policy reforms to reduce barriers to development, improve planning processes and squeeze more efficiency out of existing infrastructure. The vision of the Macro Grid Initiative is right on point by aligning transmission development with economic, environmental and consumer outcomes."

Devin Hartman,
Director of Energy and Environmental Policy,
R Street Institute

THE U.S. ELECTRIC GRID IS LAGGING BEHIND

China, the European Union, India, and other countries are modernizing their grids and building large interregional transmission lines to take advantage of low-cost, domestic, renewable resources as a way to clean up their energy production and gain advantage in the global grid technologies market.²



By the end of 2021, China is expected to have developed over 250 gigawatts (GW) of new interregional transmission capacity in a seven-year period. In contrast, only three GW of interregional capacity will have come online in the U.S. during that time, according to a new study from researchers at Iowa State University.³



Most of China's new interregional projects are ultra high-voltage direct current (UHVDC) and ultra high-voltage alternating current (UHVAC) lines. China recently completed a 2,050-mile transmission line, setting world records for length, capacity and size.⁴



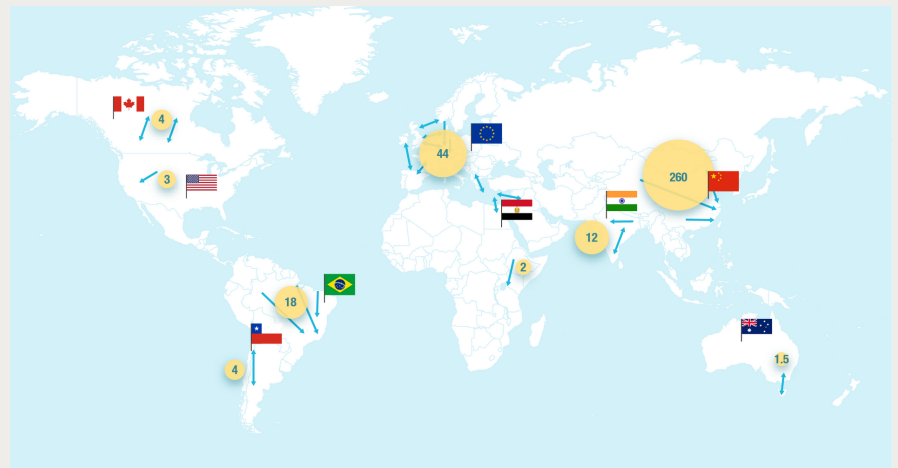
With a 2022 deadline for shutting down nuclear plants, Germany is constructing north-south HVDC lines to move wind energy to the more populous southern region. Ultimately, these separated HVDC links and the regional grid proposed for the North Sea region could be integrated into a European Macro Grid interconnecting the whole of Europe and neighboring countries.⁵

Both China and Germany see their transmission investments as an important step in creating an industry that can export technology and expertise to other countries and continents.

AMERICAN CONSUMERS & BUSINESSES BENEFIT FROM LOW-COST ELECTRICITY

Expanding and upgrading interregional transmission lines will help electric utilities, corporate and institutional buyers, and other consumers cost-effectively meet carbon and clean energy goals, as the best wind and solar resources are often in relatively remote areas. Bringing these low-cost resources online will require additional transmission investment.

Total Gigawatt Capacity of Planned or Recently Completed Interregional Transmission



Source: Macro Grids in the Mainstream: An International Survey of Plans and Progress

➤ The cost of onshore wind and utility-scale solar is competitive with the marginal cost of coal, nuclear and combined cycle gas generation. Utility-scale solar averages \$31/megawatt hour (MWh) and utility-scale wind averages \$26/MWh, while costs average \$41/MWh for coal, \$29/MWh for nuclear, and \$28/MWh for combined cycle gas generation.⁶

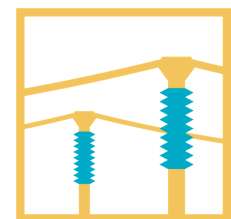
➤ Importantly, most new transmission lines must undergo cost-benefit analyses to ensure benefits for consumers. A study by the National Renewable Energy Laboratory calculates that every dollar invested in interregional transmission would return more than \$2.50.⁷

➤ A proactive approach to building a strong transmission grid will yield net savings of \$30-\$70 billion in total generation and transmission investment costs through 2030 for current regulatory compliance, and up to nearly \$50 billion annually in consumer savings in an “environmentally constrained” future.⁸

➤ The smart expansion of high-voltage interregional transmission is a largely untapped means of enhancing the reliability and the resilience of the electric grid. The nation’s grid operators report that upgrading and expanding transmission has been their primary strategy for hardening the grid when their systems have faced significant threats.⁹

SOLUTION

Policymakers across the political spectrum should work together to promote large-scale regional and interregional transmission investment.



SOURCES

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2 Macro Grids in the Mainstream, James McCalley and Qian Zhang, <https://cleanenergygrid.org/wp-content/uploads/2020/11/Macro-Grids-in-the-Mainstream.pdf>

3 Ibid.,

4 Ibid.,

5 Ibid.,

6 Lazard’s Levelized Cost of Energy Analysis, Version 14.0. <https://www.lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2020/>

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