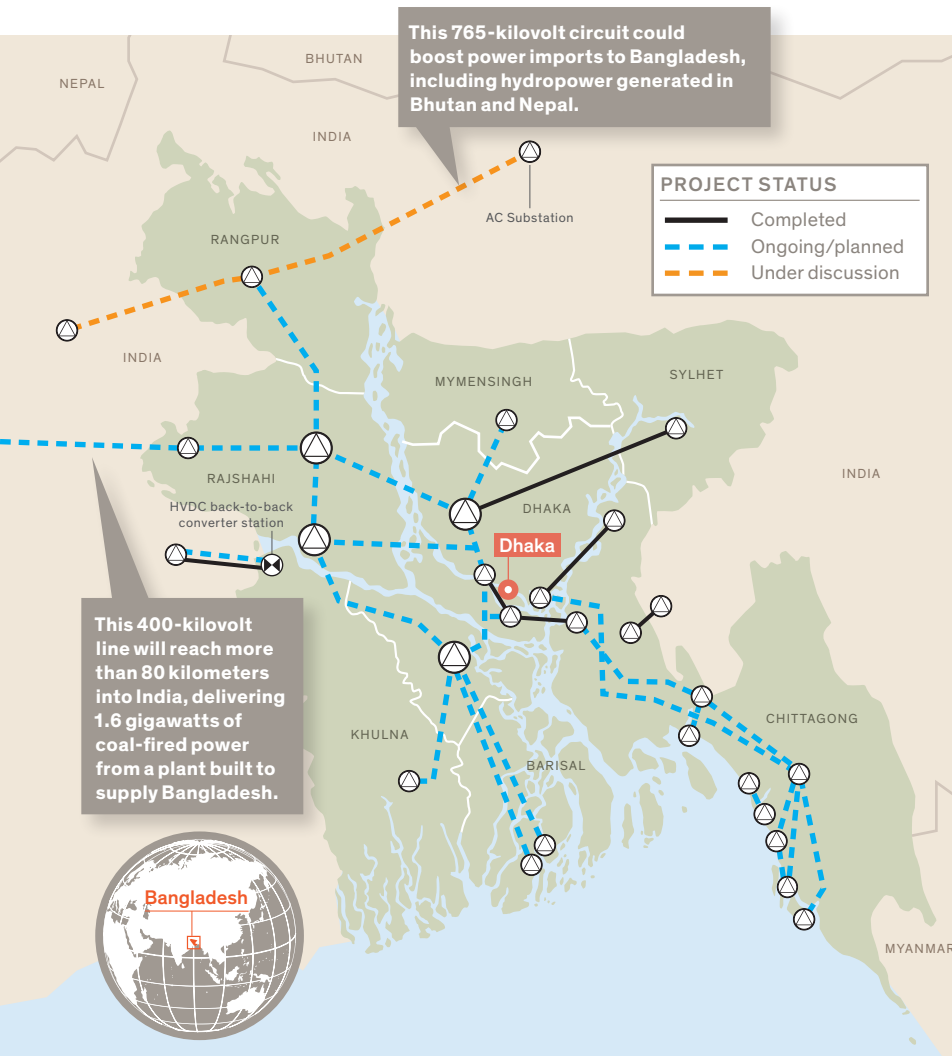


# News



## ▶ ELECTRIC THREE-WHEELERS

ferry people and goods around Bangladesh but are banned in its capital. Batteries and motors could accelerate the bicycle rickshaws that gum up Dhaka's traffic and eliminate exhaust from tuk tuks, gas-powered three-wheelers. But charging such EVs would further burden already strained power lines.

That's just one of many opportunity costs that Bangladesh pays for a weak electrical grid. Frequent power outages hurt businesses and deter foreign investment. A sweeping grid-modernization program promises to alleviate such troubles.

In 2018, the government-run Power Grid Company of Bangladesh (PGCB) doubled the capacity of its first international transmission link—a high-voltage DC connection delivering 1 gigawatt from India. This month, it hopes to finalize requirements for generators that promise to stabilize the voltage and frequency of the grid's alternating current.

And next year, Bangladesh expects to achieve universal electricity access for the country's 160 million people, only half of whom had electricity a decade ago. "It's a whole social transformation," says Tawfiq-e-Elahi Chowdhury, special advisor on energy to Bangladesh prime minister Sheikh Hasina.

However, it's not clear what the grid revamp will mean for Bangladesh's energy mix. Domestic natural gas is running out, and the country is scrambling to replace it and maintain rapid economic growth.

A nuclear power plant is now under construction, and Bangladesh is importing liquefied natural gas. But the gov-

## BANGLADESH SCRAMBLES TO GROW POWER SUPPLY

The country has promised universal electrification in 2021

ernment sees coal-fired and imported electricity as its cheapest options, and both come with challenges and risks.

Coal delivered less than 2 percent of Bangladesh's electricity last year, but plants burning imported coal could soon match the scale of its gas-fired generation. Three coal plants under construction are each capable of serving about 10 percent of the country's current 13-GW peak power demand. And Chowdhury expects similar projects in development to lift total coal capacity to about 10 GW by 2030.

The government expects to boost imports fivefold, to 5 GW, by 2030. Importing more electricity will provide access to relatively low-cost and renewable hydropower. A deal struck with Nepal should provide 500 megawatts, and more interconnections to India, as well as Bhutan, China, and Myanmar, are under discussion.

To convey these new power flows around the country, PGCB is building a network of 400-kilovolt lines atop its existing 230-kV and 130-kV lines, with several 765-kV circuits on the drawing board [see map]. The firm is simultaneously improving power quality—which will allow Bangladesh to accommodate more imported power and operate the nuclear plant.

Imports will be costlier if high-voltage DC converter stations must be erected at each border crossing. Instead, the government has agreed to synchronize its AC grid with India's, enabling power to flow freely between the two. Synchronization will not be possible, however, until PGCB eliminates its grid's large voltage and frequency deviations.



**OPPORTUNITY COST:** Bangladesh's economy has grown by an impressive 6 percent per year for the past decade despite a nagging electricity supply gap.

Sahbun Nur Rahman, PGCB's executive engineer for grid planning, says most private generators don't properly adjust the power they produce to maintain the grid's voltage and frequency. Stability has improved over the last two years, however, as government plants have stepped up. He says the grid could be ready for synchronization in as little as five years.

Coal power will push the country's annual per capita greenhouse gas emissions up to about 1 metric ton—still tiny, Chowdhury says, since the average developed economy generates 12 metric tons. Still, betting on coal is controversial for a low-lying country contending with climate change. By some estimates, global coal use needs to drop by 80 percent within a decade to hold global warming to 1.5 °C this century. And one of Bangladesh's first coal-plant projects is 14 kilometers upstream from the Sundarbans, the world's largest contiguous mangrove forest, which serves as a buffer against cyclones and sea level rise.

What's missing from the grid push, say critics, is wind and solar. Bangladesh pioneered the use of solar power to electrify rural communities. At the peak, at least 20 million Bangladeshis relied on

off-grid solar systems, and millions still do. But Mahmood Malik, CEO of the country's Infrastructure Development Company, says the expanding national grid means there's "not much need" to build more.

Off-grid solar still contributes more than half of Bangladesh's renewable electricity, which makes up less than 3 percent of its power supply. Meanwhile on-grid solar is growing slowly, and wind development has barely begun. As a result, the government will miss its commitment to source 10 percent of the nation's electricity from renewable sources by 2021.

Abdul Hasib Chowdhury, a grid expert at the Bangladesh University of Engineering and Technology, in Dhaka, says the best long-term bet for Bangladesh is imported power from beyond South Asia. He looks to the rich winds and sunshine in sparsely populated Central Asia. "South Asia is nearly 2 billion people crammed into this small space," says A.H. Chowdhury. "They will require a lot of energy in the next 50 years."

—PETER FAIRLEY

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