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Background and Impacts of World's Largest Blackout in India

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On July 30 and 31, the world's largest blackout hit India. First, the electricity supply-demand balance tightened in the northern state of Uttar Pradesh in the early morning of July 30. Troubles spread in a chain reaction, causing a blackout for the entire northern grid (one of India's six grids). The blackout hit the Delhi metropolitan region and six northern states and affected 300 million people before ending at around 7 p.m. on the same day. Another blackout came at 1 p.m. on July 31 and spread, covering the northern, eastern and northeastern grids for 22 of India's 29 states. The largest blackout in the world reportedly affected 600 million people, close to half of the total Indian population. Transportation services were disrupted as railway trains were suspended with traffic signals failing to work. Coal miners were stranded in mines as the blackout cut off electricity to elevators. Air conditioning was suspended, damaging the livelihood of citizens. Hospitals and factories had to operate emergency power systems. The blackout thus exerted great social and economic impacts.

Direct causes of the large blackout include electricity supply capacity failing to meet growing demand in India. Particularly, hydroelectric power output, which accounts for 12% of India's total electricity generation, was some 20% less than usual due to droughts. Furthermore, droughts worked to increase demand for electricity to pump up groundwater for agricultural irrigation. In some states including Uttar Pradesh that was hit first, electricity demand exceeded the supply allocated by the central government. Grid troubles contributed to spreading the blackout in a chain reaction nationwide. Concerned by the great impacts of the blackout, the Indian government has reportedly launched a panel of third parties to investigate the accident and find its causes.

While efforts are under way to trace the causes of the large blackout, we can point to some structural problems. First, electricity demand has been expanding robustly in India. As annual economic growth has remained close to 10%, electricity demand has expanded rapidly on the fast diffusion and rising utilization of electricity-consuming goods amid income growth as well as swelling electricity consumption for industrial and agricultural production. Under the 12th five-year development program lasting until fiscal 2016, electricity demand is estimated to expand to 1.4 trillion kilowatt-hours in fiscal 2016 on precondition of an annual economic growth rate at 9% and electricity demand's elasticity to gross domestic product at 0.9 (electricity demand growth at 8.1%). Contributors to the electricity demand expansion include not only economic growth and income

effects but also cheap subsidized electricity prices for the agriculture and household sectors. Particularly, agricultural and household electricity prices have been held down to very low levels. The distorted electricity pricing system is viewed as one of the factors behind the demand growth.

While electricity demand has been growing rapidly, India has failed to secure sufficient capacity for electricity generation, transmission and distribution. According to a report by the Indian Ministry of Power, electricity supply capacity has persistently fallen 10% short of peak demand since 2000, causing prevalent rolling blackouts. Therefore, many factories, hospitals and hotels have had to install private power generation facilities. The abovementioned problem of subsidized electricity prices has had a great impact on the supply side as well. Cheap electricity prices under government policy have forced power utilities, including state distributors, to remain in the red. According to an Indian government report released in December 2011, electricity distributors in 15 major Indian states (accounting for 91% of Indian electricity consumption) had a total of 566.4 billion rupees in losses (excluding those covered by government subsidies). Due to structural losses, the electricity industry's capital investment capacity has been limited. This is a major problem.

Under such situation, efficiency in the Indian electricity sector has been internationally low. The power generation efficiency for coal thermal power plants, a main electricity source in India, stands at less than 30%, over 10 percentage points lower than in Japan. The electricity transmission and distribution loss rate in India is around 25% against some 5% in Japan. Electricity stealing and failures to bill and collect electricity charges, as well as low technological efficiency levels, have contributed to the lower overall efficiency. As for coal and gas power thermal power plants as a main electricity source in India, there are problems with the development of domestic resources and the procurement of relevant fuels. While the 12th five-year development program calls for increasing electricity generation capacity by 76,000 megawatts, Coal India Limited, a state-controlled coal mining company, has promised to supply fuel for only a small portion of the new capacity. The electricity source development target is viewed as difficult to attain.

The large blackout came under these complicated diverse problems, leading India's vulnerable electricity system to be taken up as a global topic. Given the significance of stable electricity supply, responses to the blackout problem and short- to long-term solution-finding efforts are likely to have some effects on Japanese and other foreign companies' expansion into the Indian market and their enhancement of engagement with India, as well as on India's future economic development. In this sense, the Indian government's investigations into the causes of the blackout and its relevant responses are attracting global attention.

Stable electricity supply is the most important basic factor for stabilizing and sustaining economic operations and citizens' livelihood. Japan is set to consider its own electricity system reforms. I hope that the government will fully understand Japan's present electricity supply and demand challenges and proceed with reforms to solve these challenges with top priority given to stable electricity supply. Institutional and systemic reforms can greatly affect the development of

electricity sources and transmission/distribution grids, which require long lead times. It is important for Japan to discuss and consider electricity system reforms meeting its own present conditions, based on objective and realistic analyses of actual U.S. and British reforms (including both successful and unsuccessful cases) as well as electricity supply challenges including the latest Indian accident.

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