



COVID-19 IMPACT ON POWER SECTOR

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The Covid-19 pandemic is all a global health crisis. With over 75 million confirmed cases and 1.7 million deaths worldwide, there is no questioning its health impact. Beyond the immediate impact on health, the COVID-19 pandemic has major implications for global economies including energy use. COVID-19 has caused great challenges to the power sector. The power sector is the engine of the global economy, supplying electricity to all other sectors. Goods and services depend on it. In times of crisis, be it connected with the pandemic, reliable electricity supply became critical for sustained medical services. The COVID-19 pandemic and resulting lockdown measures have had an extraordinary impact on electricity demand and consumption. COVID-19 has had an impact on the power sector as a whole, particularly by leading to a reduction of demand, financial stress, and disruptions to the power supply chain.

Pandemic occurring and ensuing situation

In December 2019, COVID-19 was first identified in Wuhan, China, as a respiratory tract infection. Atypical viral pneumonia very soon disabled the world, causing catastrophic health and economic losses. On 30th January 2020, the World Health Organization (WHO) declared an outbreak, a Public Health Emergency of International Concern (PHEIC) and on Feb 2020, WHO officially named this outbreak of the disease associated with the coronavirus as COVID-19 where CO-Corona, VI-Virus D- Disease, and 19-2019 is the year it primarily occurred. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the root cause behind COVID-19 disease. SARS-CoV-2 has a 79.6% sequence match to SARS-CoV and is 96% identical to a bat-derived Severe Acute Respiratory Syndrome (SARS)-like Coronavirus. The spread of COVID-19 rooting from China in December 2019 to a global scale was categorized as a pandemic by the WHO on 11 March 2020. As of March 13, 2020, the Director General of WHO considered Europe as the centre of the global COVID-19 outbreak. All countries within Europe had a confirmed case of COVID-19 by March 20. In India, the first case was detected on 30 January 2020 in Kerala. The index case was a student returning from Wuhan and was isolated in a hospital. As of 3rd February 2020, a total of three cases were confirmed in Kerala, with all initial cases coming from different cities. On 14 March 2020, India reported its first two COVID-19 related deaths.

In March 2020, India implemented visa restrictions for countries with a high COVID-19 burden and advised home quarantine for asymptomatic travelers entering India. On 14 March 2020, all public gathering areas, such as cinemas, malls, marriage halls, pubs, marathons, and night-fests, were closed. Section 144 of the Indian penal code on unlawful assembly by more than four people was imposed to avoid gatherings. The Prime Minister of India announced 22 March 2020 as 'Janta Curfew' to solicit social distancing. On 25 March, the Indian government imposed a complete 21-day lockdown, including the suspension of domestic travel, closure of recreational places, gathering restrictions, and closure of non-essential businesses. India enforced 68 days of four-phased-lockdown starting from 24th March to 31st May to deal with COVID-19. The infection rate went under control. Nevertheless since the middle of March 2021, the second wave has

started. India continued experiencing a massive surge of COVID-19 cases and deaths like several other parts of the world. On April 09, 2021 the highest number of cases 144,829 was identified in India. As of April 10, 2021, India was the 3rd leading country based on the USA and Brazil's identified cases.

During pandemic several countries in Europe imposed lockdown in several formats. To deal with the COVID-19 emergency Government of India had announced series of strict measures asking all non-essential workers to stay home. Government closed all businesses. People were only allowed to go outside for essential necessities and health reasons. India to make the lockdown and social distancing effective, the government also levied the quarantine law under the Epidemic Disease Act, 1897. This 123-year-old legislation allows a state/country to inspect people traveling by railways, ships (air travel was not an option at that time when this law was created), and segregate suspects in hospitals, under temporary accommodations, or otherwise to prevent the spread of dangerous pandemic disease.

Pandemic socioeconomic repercussions

The world suffers the socioeconomic repercussions of the COVID-19 pandemic. It is the economic and humanitarian contretemps tagged as a black swan by numerous economists. This is the greatest emergency for the Indian economy since independence. The pandemic has led to a large-scale economic disruption across various sectors and in all parts of the country. Colossal predicament sprouted like Twin Balance Sheet (TBS), high levels of non-performing assets (NPAs) and an inadequately capitalized banking system. In the private corporate sector, firms are financially weak and over-leveraged. It is estimated that the cumulative costs of the nationwide shutdown will be approximately 4 percent of India's gross domestic product (GDP). The manufacturing sector, the major contributor of GDP and employment in the secondary sector which is recognized as an engine for vibrant growth and creator of the nation's wealth has badly suffered by demand-supply disruptions, transport constraints, mobility restrictions and global value supply chain. Important dimensions of service sector like aviation, transport, travel, and tourism are also worst hit. Mass reverse-migration of labor to their native places has further added to the misery. The COVID-19 pandemic has hit hardest to the industries that are consumer-facing, including small shops, restaurants. Men have borne the brunt of job losses, due to the sensitivity of construction and manufacturing sector to economic cycles. The higher-paid workers are working from home while lower-paid blue-collar workers typically do not have this option. The most marginalized and deprived children have been hit the hardest, and existing inequalities have been exacerbated. The pandemic is deepening geographic inequality with people living in poor places being more vulnerable to the health and economic impacts of the pandemic. The COVID-19 health crisis has quickly turned into an economic crisis. As economies slide into recessions and households lose income. The extent of financial affect shall depend on the severity and longevity of the crisis, effectiveness of the implementation of fiscal and monetary policies. The impact of COVID-19 on the Indian economy is still unfolding. Potential new practices and social forms facilitated by the pandemics have resulted into severe impact on the power system.

Pandemic and electricity consumption

The procedures implemented by the Indian government to manage the COVID-19 quandary have drastically changed peoples' habits and activities at the national level. This change in behavior is reflected in the electricity system, in particular in terms of changes in electricity consumption profiles. Impacts of COVID-19 on energy demand and consumption have been substantial. The state of alarm decreed by the government and the gradual restriction on activities to deal with the COVID-19 pandemic has led to a considerable reduction in electricity demand. This is a direct consequence of population containment measures, and the closure of public and industrial centres as a means to curb

the pandemic. The ban on public events and gatherings, and reduced activities has lowered the daily consumption. During the lockdown, there has been an increase in domestic demand as people have been spending more time at home and working from home.

Electricity demand dropped under lockdown, with dramatic reductions in services and industry only partially offset by higher residential use. When confinement was eased electricity demand showed the first signs of recovering. The softened lockdown measures corrected the consumption level.

India's power consumption shrunk 9.24% and 22.75% in March 2020 and April 2020. The country's electricity consumption fell by nearly 19% on 3 April 2020. This slump in power consumption narrowed down in May 2020 to 14.16%. The recovery of the power demand can be co-related to the government starting of relaxations for economic activities and the increased use of air conditioners as the temperature soared beyond 45 degrees Celsius in May. The recovery of electricity demand in country was confirmed with higher levels than in 2019 starting in early August. In September 2020, electricity demand corrected, was 3.4% above September 2019 in average, driven by higher demand in industrial and commercial sectors, as well as higher demand for irrigation compared to 2019. In October 2020, the relaxing of restrictions and a stronger economic environment led to electricity demand - weather corrected; more than 10% above October 2019 levels, in line with pre Covid-19 trends.

By mid- to end-November 2020 the upward trend inverted again and returned to last year levels due to the Diwali festival taking place a fortnight later in 2020 than 2019 and strikes in the agriculture sector. The upward trend resumed in December, with year-end reaching above 8% compared to previous year.

Pandemic and electricity production

In India, the coal-based power generation reduced by 26% in the two weeks just after the lockdown began in March 2020. The gap between coal and renewables significantly narrowed after the first lockdown measures were taken, with renewables reaching just over 30% in mid-August 2020. Starting end-August the gap started to widen again, following seasonal trend. By the end of November, the share of renewables in the electricity mix was just below 20%, in line with start of the year pre-Covid19 levels. Since late May 2020, levels of electricity demand have recovered. Starting late July 2020, electricity generation was higher than in 2019 for the first time since the beginning of lockdown, maintaining this trend for four consecutive weeks.

In the last two weeks of August 2020, the trend inverted with lower generation levels than those observed in 2019, driven by lower demand. In September and October, electricity generation was back on its growing path. By mid- to end-November, the upward trend inverted again and returned to 2018 levels due lower demand associated with a combination of seasonal e.g. Diwali holidays and episodic agricultural strikes factors. The upward trend resumed in December 2020.

Pandemic and electricity market

Coronavirus-induced nationwide lockdown disrupted the electricity market. The spot electricity price plays an important role in the demand and supply of electricity in India. Indian Energy Exchange Limited (IEA) the largest energy exchange in India where electricity trading takes place, and 1 day-ahead spot price and quantity of electricity are determined by the bidding process witnessed the spot electricity average market clearing price Rs./kWh dropped uni-directional during COVID-19 phase.

To Windup

The outbreak of COVID-19 has indeed caused dramatic impacts on power sector. Widespread occurrence of an infectious disease affects electricity consumption, production, maintenance, operational activities, development plans, and etc. The

coronavirus pandemic has exacerbated many of the existing challenges the sector faces to its financial and physical resilience. India saw one of the largest electricity demand destructions. The pandemic has also affected the generation mix. Thermal power plants were running at low capacity in the absence of industrial demand, while the share of renewables on the grid has been increasing, mostly because of their “must-run” status. The changes in energy intensity (GDP/Mtoe) presented spatial-temporal differences. The resilience of the electricity sector has become critical, as hospitals and residents need to rely on stable power. The pandemic is compelling India to strengthen its ability to maintain security of supply, boost system flexibility and better integrate its power hardware and software for effective preparedness in the face of potential threats to electricity security. A steady, reliable power supply is a high priority for everyone. Power is essential for driving economic growth, especially in emerging markets. Achieving Sustainable Development Goal (SDG) 7—Ensure access to affordable, reliable, sustainable and modern energy for all. The world is still far from controlling the pandemic, not much is known about how the increased number of COVID-19 cases shall affect power system. May this year bring an end to this pandemic and the beginning of a “not-so-normal” lifestyle in which could be decided that it is time to build a fairer, more inclusive and sustainable power sector. System thinking is recommended to analyze how to stabilize power sector. In such a crisis it is the government’s response that could create the strongest momentum for power sector reform.

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