

XII

SUSTAINABLE DEVELOPMENT AND ENERGY POLICY IN INDIA'S COVID-19

Dr. Varsha Raghunath Shinde

Abstract: India is the world's third-largest energy consuming country, thanks to rising incomes and improving standards of living. Energy use has doubled since 2000, with 80% of demand still being met by coal, oil and solid biomass. On a per capita basis, India's energy use and emissions are less than half the world average, as are other key indicators such as vehicle ownership steel and cement output. As India recovers from a Covid-19 induced slump in 2020, it is re-entering a very dynamic period in its energy development. Over the coming years, millions of Indian households are set to buy new appliances, air conditioning units and vehicles. India will soon become the world's most populous country, adding the equivalent of a city the size of Los Angeles to its urban population each year.

India Energy Outlook 2021 explores the opportunities and challenges ahead for India as it seeks to ensure reliable, affordable and sustainable energy to a growing population. The report examines pathways out of the crisis that emerged from the Covid-19 pandemic, as well as longer-term trends, exploring how India's energy sector might evolve to 2040 under a range of scenarios.

Keywords: CCUS- Carbon Capture, Usage and Storage

Introduction: The Covid-19 pandemic has highlighted an opportunity to maximise the impact of India's energy policies while reducing air pollution and greenhouse gas emissions. In recent years, India has made major progress in implementing energy policies that have set it on the path to achieving the UN Sustainable Development Goals. It has been successful in providing more of its citizens with electricity access, boosting energy efficiency and renewable, and taking steps to reduce air pollution. The road to achieving them could be challenging, however. Given that India's energy sector alone accounts for [74% of the country's greenhouse gas emissions](#), the need to reduce air pollution and emissions should be carefully considered and incorporated in India's energy policy framework to accomplish its clean energy transition.

In the context of the Covid-19 crisis, reducing pollution and emissions assumes even greater importance. Air pollution contributes to heart and lung diseases, [including Covid-19](#). Reducing air pollution and emissions by strengthening green stimulus policies – with a focus on energy efficiency and renewable energy – will aid economic recovery in the short-term by creating jobs.

A. Covid-19 will leave lasting scars:

Prior to the global pandemic, India's energy demand was projected to increase by almost 50% between 2019 and 2030, but growth over this period is now closer to 35% in the STEPS, and 25% in the Delayed Recovery Scenario. The latter would put some of India's hard-won gains in the fight against energy poverty at risk, as lower-income households are

forced to fall back on more polluting and inefficient sources of energy. It would also extend the slump in energy investment, which we estimate to have fallen by some 15% in India in 2020. Even though the pandemic and its aftermath could temporarily suppress emissions, as coal and oil bear the brunt of the reduction in demand, it does not move India any closer to its long-term sustainable development goals.

B. India's size and dynamism will keep it at the heart of the global energy system

An expanding economy, population, urbanisation and industrialisation mean that India sees the largest increase in energy demand of any country, across all of our scenarios to 2040. India's economic growth has historically been driven mainly by the services sector rather than the more energy-intensive industrial sector, and the rate at which India has urbanized has also been slower than in other comparable countries. But even at a relatively modest assumed urbanization rate, India's sheer size means that 270 million people are still set to be added to India's urban population over the next two decades. This leads to rapid growth in the building stock and other infrastructure.

C. India requires a massive increase in power system flexibility

The pace of change in the electricity sector puts a huge premium on robust grids and other sources of flexibility, with India becoming a global leader in battery storage. India has a higher requirement for flexibility in its power system operation than almost any other country in the world. In the near term, India's large grid and its coal-fired power fleet meet the bulk of India's flexibility needs, supported by hydropower and gas-fired capacity. Going forward, new power lines and demand-side options – such as improving the efficiency of air conditioners or shifting the operation of agricultural pumps to different parts of the day – will need to play a much greater role. But battery storage is particularly well suited to the short-run flexibility that India needs to align its solar-led generation peak in the middle of the day with the country's early evening peak in demand. By 2040, India has 140 GW of battery capacity in the steps, the largest of any country, and close to 200 GW in the Sustainable Development Scenario.

D. Booming industry and transport push up CO₂ emissions and harm air quality

A 50% rise in India's CO₂ emissions to 2040 is the largest of any country in the steps, even though India's per capita CO₂ emissions remain well below the global average. The increase in India's emissions is enough to offset entirely the projected fall in emissions in Europe over the same period. The remarkable rise of renewables arrests the growth in India's power sector emissions in the steps, although this still leaves the coal-fired fleet – the fifth-largest single category of emissions worldwide today – as a major emitter of CO₂. Alongside the option of early retirement in some cases, this puts a strong premium on policy approaches that can retool this fleet for more limited and flexible operation and/or on technologies such as carbon capture, utilisation and storage (CCUS). But the main reasons for the increase in India's CO₂ emissions in the steps lie outside the power sector, in industry and transport (especially from trucks). These two sectors are also responsible for a much larger share of air pollutant emissions than the power sector in the steps, and a rising urban population means

that more people are exposed to air pollution and suffer its ill effects. Water stress is likewise an increasingly important factor for India's energy sector and its technology choices.

E. Efforts to ensure sustainable energy for all can have significant climate and air pollution benefits

Achieving universal household and rural energy access, including electricity and clean cooking – one of the targets under the seventh Sustainable Development Goal – has been a key priority for India for the past 15 years. In April 2018, the government announced that India had achieved its goal of providing electricity to every village in India. Just one year later, the government indicated that it had [connected all households](#). This not only has important social development benefits, giving children light to study in the evenings and powering rural health and social facilities, but also improves indoor air quality, as kerosene is replaced with electricity. Electricity can also increase productivity in agriculture and rural small and medium enterprises. Progress in access to clean cooking, however, has been much slower, but government programmes have helped half of the country's population use cleaner fuels, such as liquefied petroleum gas, for cooking.

F. Energy sector is key to tackling air quality and climate change issues

The Covid-19 pandemic has significantly lowered electricity and oil demand, as well as industrial production, reducing fossil fuel combustion. As a consequence, air quality has improved dramatically, providing Indians with a glimpse of what life without air pollution could be like. This will increase the pressure to solve the air pollution crisis in India. Sustainable energy policies will be key to reaching this goal. They can also help India to meet the objective in its nationally determined contribution (NDC) under the Paris Agreement of reducing its CO₂ emissions intensity by 33-35% from 2005 levels by 2030.

In the power sector, full implementation of stringent air pollution standards and decarbonisation of the power mix would reduce sulphur dioxide emissions from the sector by 90% between now and 2040. Ambitious renewable energy targets that reflect the extensive **growth potential for modern renewables** (which exclude traditional biomass) can also contribute to meeting air pollution objectives. The government of India has announced a renewable capacity target of 450 GW by 2030 (excluding large hydropower), a sharp increase from a total installed renewable electricity capacity of 80 GW in 2019. Ensuring that renewable electricity generation remains an integral part of the air pollution reduction strategy will also limit growth in CO₂ emissions.

One unexpected benefit of the Covid-19 pandemic was that the gap between the shares of renewables and coal-fired power in India's electricity generation narrowed more than ever before. Renewables rose from 17% just before the pandemic to almost 24% and coal-fired power declined from 76% to 66%. This reflects the government's commitment to decarbonise power generation through renewables, notably using priority dispatch schemes. A reduction in unabated coal-fired generation would reduce both air pollution and CO₂ emissions, improving the long-term health and well-being of Indian society.

G. Clean energy transition is good for both the economy and the environment

Implementation of energy efficiency measures, particularly in the industry, services and buildings sectors, has been key in helping India to **decrease its energy intensity** by 27% over the past ten years. Over the same period, India's primary energy demand nearly doubled, driven by strong economic growth averaging 6.8% a year. Improving efficiency not only benefits economic productivity but also reduces emissions. Efficiency improvements undertaken between 2000 and 2018 [helped avoid 14% of CO₂ emissions](#), as well as more than 15% of SO₂ and NO_x air pollutant emissions. The government has introduced a range of new policy measures to further improve energy efficiency, which will create jobs as well as lower emissions. These policies could [reduce energy intensity by over 30%](#) by 2030 compared with 2018. They would improve energy efficiency by 3.3% a year, aligning India with target 7.3 of the Sustainable Development Goals. Air pollution reduction policies support clean energy technologies that also improve energy access and reduce CO₂ emissions. The synergies could be even stronger: It is now all the more important for the Indian government to carefully consider the impacts of its energy policies, which could bring lasting benefits for the health and well-being of its citizens. The Covid-19 pandemic should be used as an opportunity to fast-forward India's sustainable energy goals. These will help India not only in its fight against the pandemic, but also in reviving its economy by creating jobs in clean energy industries. There is much to gain in India from continuing to tackle these challenges through increasingly linked policy agendas. The path that India will take will provide many lessons for countries around the world.

Conclusions: India's future prosperity will hinge on affordable, clean and reliable energy. India has seen extraordinary successes in its recent energy development, but many challenges remain, and the Covid-19 pandemic has been a major disruption. In recent years, India has brought electricity connections to hundreds of millions of its citizens; promoted the adoption of highly-efficient LED lighting by most households; and prompted a massive expansion in renewable sources of energy, led by solar power. The gains for Indian citizens and their quality of life have been tangible. However, the Covid-19 crisis has complicated efforts to resolve other pressing problems. These include a lack of reliable electricity supply for many consumers; a continued reliance on solid biomass, mainly firewood, as a cooking fuel for some 660 million people; financially ailing electricity distribution companies, and air quality that has made Indian cities among the most polluted in the world.

References:

Aggarwal, M. India's Power Consumption Falls by 19 Percent During COVID-19 Lockdown. 2020. Available online: <https://india.mongabay.com/2020/04/indias-power-consumption-falls-by-19-percent-during-covid-19-lockdown/> (accessed on 17 June 2020).

IEA. International Energy Agency, COVID-19 Impact on Electricity. 2020. Available online: <https://www.iea.org/reports/covid-19-impact-on-electricity> (accessed on 16 June 2020).

Mehta, K.; Jha, S.S. COVID-19: A Nightmare for the Indian Economy. *SSRN Electron. J.* **2020**, *31*, 333–347. [[Google Scholar](#)] [[CrossRef](#)]

Mori, H.; Takahashi, Y.; Zusman, E.; Mader, A.; Kawazu, E.; Otsuka, T.; Moinuddin, M.; King, P.; Elder, M.; Takai, E. *Implications of COVID-19 for the Environment and Sustainability*; Institute for Global Environmental Strategies: Hayama, Japan, 2020; Available online: <https://www.iges.or.jp/en/pub/covid19-e/en> (accessed on 18 June 2020).

Pillay, A. Lockdown Knocked Power Consumption Down by Up to 40% in Large Cities. *The Business Standard*. 2020. Available online: https://www.business-standard.com/article/printer-friendly-version?article_id=120061800951_1 (accessed on 18 June 2020).

The Earth Institute, Columbia University, New Data Suggest COVID-19 Is Shifting the Burden of Energy Costs to Households. 2020. Available online: <https://blogs.ei.columbia.edu/2020/04/21/covid-19-energy-costs-households/> (accessed on 22 June 2020).

The Economic Times. India's Power Consumption Shrinks 9.24% at 100.13 BU in March. 2020. Available online: https://economictimes.indiatimes.com/industry/energy/power/indias-power-consumption-shrinks-9-24-at-100-13-bu-in-march/re_show/74933363.cms (accessed on 12 June 2020).

The Economic Times. The Economic Times, Lockdown Pulls down Power Consumption by 22.75% to 85.05 BU in April. 2020. Available online: <https://economictimes.indiatimes.com/industry/energy/power/lockdown-pulls-down-power-consumption-by-22-75-pc-to-85-05-bu-in-apr/articleshow/75533685.cms> (accessed on 12 June 2020).

The Economic Times. The Economic Times: India's Fuel Demand Nearly Doubles in May as Lockdowns Ease. 2020. Available online: <https://economictimes.indiatimes.com/industry/energy/oil-gas/indias-fuel-demand-nearly-doubles-in-may-as-lockdowns-ease/articleshow/76308664.cms> (accessed on 13 June 2020).