CPPR EVENT REPORT

Webinar on

The Future of Coal in India: Balancing between Energy Security and Sustainability

Proceedings Report

- **About the event:** A webinar was conducted to discuss and analyse the future of coal in India by the Centre for Public Policy Research (CPPR) on the 16th of February 2023, at 4:30 P.M. IST. The aim of the dialogue was to bring an informed discussion on matters such as feasibility of life with or without coal, closure of old coal power plants, meeting market requirements of coal in a timely manner, technologies to make coal greener, as well as sustainable usage of coal, to the general public.

- **The Speakers:**
    - **Dr. Anand B. Rao** is the Institute Chair Professor and Head, Centre for Technology Alternatives for Rural Areas (CTARA), IIT Bombay. He is also

associated with the Interdisciplinary Program in Climate Studies (IDP-CS), and the Ashank Desai Centre for Policy Studies (ADCPS) at IIT Bombay. He holds Ph.D. from the Department of Engineering and Public Policy at Carnegie Mellon University, Pittsburgh, USA; M.Tech. in Environmental Science and Engineering and B.Tech. in Chemical Engineering, both from IIT Bombay. His areas of research interest include Energy and Environment, Technology Assessment, Climate Change Mitigation, Carbon Capture and Sequestration (CCS), Energy Policy and Planning, Rural Energy Consumption, and Rural Livelihoods. He has served as a Lead Author for the Chapter 3 ("Mitigation pathways compatible with long term goals') in the Intergovernmental Panel on Climate Change (IPCC) Assessment Report 6 (AR6) for the Working Group – III. He teaches courses related to Energy, Environment and Climate Policy.

- **Mr. Balasubramanian Viswanathan** is a Policy Advisor (Energy) at the International Institute for Sustainable Development (IISD). He engages in data collection and analysis, stakeholder consultations, policy review, project management and communication, on issues related to energy and climate. He is based in New Delhi. Bala holds a Bachelor's degree in mechanical engineering from BITS Pilani (India) and a Master's degree in sustainable energy engineering from KTH Royal Institute of Technology (Sweden). His recent work includes tracking government subsidies and the role of state-owned enterprises in a changing energy landscape.

- **Mr. Toby Lockwood** is Director of Technology and Markets for Carbon Capture (Europe) for Clean Air Task Force (CATF)**.** In this role, he leads CATF's analytical work to highlight the role of carbon capture in helping Europe meet its climate goals. Prior to joining CATF, Toby worked on carbon capture for nine years with the IEA Clean Coal Centre, where his projects included in-depth studies into the decarbonisation of coal power in China and India. He writes regularly on CCS and other energy sector issues for industry publications. Toby has Masters degrees in chemistry and materials from the University of Cambridge, Imperial College London, and McGill University.

- The webinar was moderated by **Dr. Madhu P. Pillai,** Advisor, Industry & Energy at CPPR. Dr Pillai is a Project Management Expert with more than 36 years of broad-based Oil & Gas, Petrochemical, and Power industry experience in Operations

and Project Management in India, Nigeria, the USA, Bahrain, Qatar, and Saudi Arabia. Dr Pillai is an Engineer with a post-graduation in Management and a PhD in Strategic Project Management. He is a Fellow of many leading international organisations like AACEI, ICEC, Institution of Engineers, etc. Dr Pillai was presented with the OT Zimmerman Founder's award by AACEI in 2008 for his contribution to the Global Cost Management Professional Community.

Summary of Discussions

1) The discussion sought to bring an informed dialogue on the future of coal, with matters such as the feasibility of life with or without coal, closure of old coal power plants. The speakers in the dialogue also touched upon meeting the market requirements of coal in a timely manner, and the sustainable use of coal. The aim of the dialogue was to blend the national scenario to some extent with a global perspective and augment the knowledge base of all stakeholders not limited to academia, practitioners, policy makers and energy experts across the nation.

2) When asked about the future of coal by 2050, Mr. Anand Rao stated that not only does he see coal playing a pertinent role by 2050, but he envisages a future for the resource well beyond that deadline, through to 2070. He opined that the abundance and low cost of coal will play a part in the continued usage of coal globally. Lastly, he stated that renewables are seasonal and time-dependent; in the absence of converting/adapting grid infrastructure to renewables, coal will continue to play a key role in the developing part of the world.

3) Mr. Balasubramanian Viswanathan claimed that energy security concerns, combined with the vested interests of State-Owned Enterprises (SOEs) were responsible for driving the growth of the coal sector in the country. He iterated that there was growing climate consciousness among the market forces, and that they are going to drive a dramatic phasedown of coal in the future. The concept of 'exponential growth' may be witnessed from 2030 in terms of renewables. With the drop in renewable energy sourced electricity prices, a greater potential for investments into renewables became evident.

4) While responding to a question on transition away from coal, Mr. Toby Lockwood asserted that a phasedown of coal will be more challenging for India than it is for the

US and Europe, as the latter have abundant supplies of gas they can switch to. Additionally, the expected growth in the per capita demand in those countries is significantly low as compared to India. Thereby, In order to fulfil this growing demand, India might need to tap into its coal reserves, which makes a phasedown of coal all the more challenging.

5) Coal power generation is becoming more expensive than energy from renewables. However, the prices of renewable sources do not take into account the variability and intermittency in their generation, while coal offers firm, dispatchable power, as per Mr. Lockwood. He asserts the need for energy markets to recognise this difference while going forward.

6) When asked about the hits and misses of policy decisions surrounding coal sustainability in India and across the world, Mr. Lockwood claimed that there is a false perception that CCS doesn't play a role in this transition. He stressed on the need to rethink incentives for CO2 abatement technology, while bemoaning the lack of political will for the technology, as compared to the amount of political will thrown behind renewables, leading to their rapid deployment and proliferation.

7) In the early stages, in the deployment of any technology including CCS, large scale subsidies are needed, until the cost comes down, opined Mr. Lockwood. However, once the technology is successfully demonstrated and its price reduces, it can be sustained through carbon pricing and taxes.

8) Mr. Lockwood believed that if carbon emissions are priced highly enough, it could have a positive impact by discouraging some companies and industries from emitting CO2. In addition, if the level of tax credit for CO2 storage is raised, as has been done in the US, it could act as a substantial incentive for the deployment of CCS. However, in spite of the positives that could result from appropriate carbon pricing, Mr. Lockwood found it to be a mechanism which would not find great favour in India.

9) Mr. Rao opines that while underground geological sequestration sites present themselves as possibly permanent solutions for the storage of CO2 captured through CCS, the storage of CO2 leads to the creation of a liability for future generations. As they have to avoid the risk of CO2 seeping back into the atmosphere.

10) He also stated the need for huge funding to implement the CCS technology in India's coal power plants. This could also cause a substantial increase in the price of electricity generated. Considering these pressing problems, Mr. Rao opines that developed countries should demonstrate the application of this technology, and only then should developing countries follow suit.

11) The speaker Mr. Viswanathan was asked to share insights from a report co-authored by him, titled "Mapping India's Energy Policy 2022", which tracked governmental support for the energy sector from 2014-2022.
    a) Aggregating the support extended through various avenues such as subsidies, investments by SOEs and investments by public finance institutions, the report estimated a total outlay of 4 lakh crores for this sector;
    b) India's coal subsidies have remained stagnant and relatively limited over the years. Mr. Viswanathan stresses that if the government taxes coal leading to an increase in the electricity generation cost, and if this financial burden is not passed on to the consumer, it is absorbed by the DISCOMs who are already saddled with debt. Any further costs to the coal sector, through technologies like CCUS, is likely to cause problems in the way electricity is priced across the country.

12) While attempting to counter the claims of Mr. Rao, who emphasised on the threats of a leakage from CO2 sequestration sites. Mr. Lockwood asserted that the IPCC report on CCUS says that in an appropriately selected geological formation, there is extremely low likelihood of CO2 leakage. The organisation claimed that the percentage of CO2 retained in these formations could exceed 99% over a 100 years as well as 99% over a 1000 years too.

13) As part of a study titled "A Pathway to Reducing Emissions from Coal Power in India (2021)", co-authored by Mr. Lockwood, the distance between the existing power plant locations and nearby CO2 storage sites were analysed, and the potential incentives and policy mechanisms on incentivisation of the deployment of CCUS were studied.

14) Mr. Lockwood opined that as part of attempting to reduce CCUS costs, the first step is to map out storage sites for CO2 which then needs to be matched with areas of high emissions. Further, clusters of CO2 capture can be mapped, where lots of large emitters can access shared infrastructure and economies of scale can thereby be achieved.

15) While discussing the high costs of CCS, Mr. Lockwood proposed the need for CCS-abated gas power in the grid. He stresses that instead of focusing on the high costs of CCS, it is paramount that the urgency of this technology is recognised.

16) Mr. Lockwood emphatically announces that the free power market is over - it is now a question of how you can craft contracts to deliver the zero-carbon grid which is urgently needed, a mechanism which must be applied to firm power as well as to renewables.

17) Mr. Viswanathan proposed conducting a little thought experiment where he rallied the audience to think of themselves as stakeholders in the coal sector:
    a) As a financial investor who has a fossil fuel-heavy portfolio, it is becoming more and more difficult to raise capital in international markets courtesy growing climate consciousness in global markets.
    b) As a power plant developer, it will be difficult due to high market risks and difficulty in raising finance because of decreased lending to the coal sector. Thereby, as a power plant developer, one will be inclined to bet on the renewables sector.
    c) From the government perspective, there are two major viewpoints - the energy security perspective, and the jobs/ dependent communities-related perspective. In terms of energy security, the best solution is to manufacture domestically, so as to reduce reliance on imports. In terms of jobs, domestic manufacturing has tremendous capacity.
    d) As an end-use customer, who is going to face the increasing costs associated with say coal taxes. Coal + CCUS has greater economic and technological prospects as against renewables with round the clock storage. Although the upfront costs of CCUS should be borne by developed countries.

18) It is possible that a situation arises where you have long periods of energy demand with limited production capacity of renewables because of the conditions that prevail. That is why we need clean firm power to serve as backups to renewables, which may take the form of nuclear fission power, or coal accompanied by CCS technology.

19) Mr. Rao brought out the glaring inequalities in the energy provisions for rural vs urban areas. He claimed that in spite of India announcing 100% rural electrification, 24/7 power for all still remains a distant dream. With such a backdrop, he stresses on the

fact that while renewables are an urgent global need, the provision of the “unmet demand” of rural India may need to be serviced through coal-fired power.

Key takeaways

1) Coal may provide effective firm power as a backup to renewables.
2) The high upfront cost of CCUS is a major hurdle.
3) There needs to be demonstration of CCUS technology by developed nations before developing nations set forth. Further, developed nations should ideally support developing nations financially for the implementation of CCUS.
4) With the drop in electricity generation prices from renewable sources as compared to coal, a greater potential for investments into renewables is becoming evident.
5) A phasedown of coal will be more challenging for India than it is for the US or Europe, as the latter have abundant supplies of gas they can switch to and low growth in per capita demand.
6) Coal power generation is becoming more expensive than energy from renewables. However, the prices of renewable sources do not take into account the variability and intermittency in their generation, while coal offers firm, dispatchable power.
7) In spite of the positives that have resulted from carbon pricing and taxes across the world, there are doubts about the effectiveness of this measure in India.
8) The risk of leakage/s from CO2 sequestration sites under CCUS need to be studied.

This report has been prepared by our interns Mr Jay Hajare and Ms Ashna