



# WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2022

**TOWARDS A RESILIENT PLANET:  
ENSURING A SUSTAINABLE AND EQUITABLE FUTURE**

February 16-18, 2022 (Virtual)



Industry Charter for  
**Near ZER**  
**Emission** by 2050



## Research and Innovation Outlook for Industry Decarbonisation in India

### THEMATIC TRACK SUMMARY

Venue: Chinnar

Date: February 16, 2022

Time: 11:30 AM - 01:00 PM (IST)

#### Suggested Citation

World Sustainable Development Summit (2022), Research and Innovation Outlook for Industry Decarbonisation in India, Thematic Track Summary (Rapporteur: Sneha Kashyap), New Delhi: The Energy and Resources Institute.

## Actionable Messages

**Message 1:** Four pillars to decarbonisation are energy efficiency, greening the energy mix resource efficiency and material circularity, deep decarbonisation technologies, such as use of hydrogen fuel, or carbon capture, utilisation and storage (CCUS).

**Message 2:** Strong partnerships among customers, academia, corporates, think tanks, regions and cities, and Innovative business models are necessary to have aligned strategies that will work for the planet and the organizations.

**Message 3:** There is a need to enable knowledge sharing among the collaborators to Fast-Track transition and decarbonisation technologies, de-risk investments, and, provide progressive solutions which will help in accelerating decarbonisation.

**Message 4:** Major barriers towards industrial decarbonisation in the country that needs to be taken into consideration are:

- Slow paced research and innovation
- Lack of market mechanism
- Lacking viability gap funding
- Lack of policy and regulatory support by the government
- Lack of incentives and premium for green products by the government
- Less or no discussion on carbon pricing



## Narrative

Sectors like Iron and steel, cement, fertilizers are being termed as harder to abate (HTA) and these are moving towards overall decarbonisation. In industry, almost 70-80% of emissions are from thermal energy use and the rest is balanced through electricity. Research within TERI and globally has focussed on decarbonisation, with give an idea that technically it is possible to reduce the emission from the industrial processes but the real challenge comes out as commercial applicability of those technologies. TERI recent studies has instated the belief of four pillars towards the way to industrial decarbonisation. The objective of the deliberation was to explore research and innovation activities across academia like IIT Bombay and the view on possible steps to move forward to decarbonisation from supply and demand side.

**Mr Anshul Mathur** from BP, p.l.c. gave stated the motive of the organisation 'Reimagine Energy for the people and the planet'. BP has set its target to achieve net zero by 2050 or sooner. He emphasizes the importance of Strong partnerships among customers, academia, corporates, think tanks, regions and cities, and Innovative business models to have aligned strategies that will work for the planet, to share knowledge and fast-track technologies, to de-risk investments, to progress solutions at pace and scale which will help in accelerating decarbonisation. He quotes that 'The world is changing, energy transition is underway and collaborative efforts can show leadership to India's energy transition'. **Prof. Srinivas Seethamraju**, IIT Bombay gave insights to the research work done in past two years with BP on providing solution to decarbonisation of Industrial sectors such as steel, cement and fertilisers. He briefly touched upon the current energy consumption and emission profile of Indian industries mentioned above and where it stand on global front. He also reiterated the five pillars given by **Mr Girish Sethi** for achieving decarbonisation along with the examples of worldwide spread technologies across sectors such as; improving energy efficiency in aluminium by replacing steel with copper collector bar in cathode, zero carbon aluminium smelting demonstration plant at Canada, using biomass gasifier in rerolling mills, aluminium smelters, calcium looping in cement, carbon capture, utilisation and storage (CCUS) in fertilizers.

The panel discussion gave the perspective from the supply side; focusing on cement, steel, and fertilisers. **Mr Arvind Bodhanker** from Dalmia Bharat Group laid out the initiatives and targets to achieve net-zero by 2040 and their commitment to 100% low carbon cement production while doubling the energy productivity by 2030. He threw light on the need for technological advancement but challenges in terms of cost and the necessity of grants or fund flow into the industry, carbon marketing with the right pricing, and trade flexibility in the global market.

**Mr Lokendra Raj Singh** states the lack of concrete policy, regulation and standardization for the new facilities and green products. There should be a defined specific energy consumption for new plants. He says to drive decarbonisation in the existing facility, requires large investment and policy support. JSW has took lead in installing super large blast furnaces, coupling them with latest gadgets on automation and digitalization, replacing energy with renewables and utilizing waste heat to improve energy and resource efficiency in their plants. JSW is also looking into capturing, storing and utilizing CO<sub>2</sub>.

End-use sectors are also very well contributing to decarbonisation journey. One such example is Delhi Airport have committed to achieve net zero 2030. With the green infrastructure, airports are also operating with sustainable fuels to reduce emissions. Government of India schemes like 'Open Access, Power Purchase' have helped airport in accessing renewable energy. The civil aviation sector has high demand for green steel and cement as the airports aims to have green infrastructure and reduce their carbon footprint but opportunities in the market for green products are lacking.

**Mr Muthukrishnan** from his end user perspective said that only aviation is responsible for 2% as compared to 14% of total transport sector emissions. As the airports are getting privatised and developed, the raw material sourcing, enhancing process efficiency with advanced technologies and low carbon emission in supply chain should be the areas needs to be looked at to reduce overall emission intensity.

Fertilisers sector is among the best industry in the world terms of efficiency. Cost of production is regulated by the Government of India and the energy norms are revised periodically. Plants are operating on natural gas fully with small portion of coal just for steam and bubble generation. Fertilisers Association of India also shares strong connection

with International Fertilisers Industry Association and participates in periodic benchmarking exercise for ammonia. Since 1988-89, fertiliser industry has reduced specific energy consumption (SEC) by almost 34-35% for ammonia and urea, emissions to 2 tonnes CO<sub>2</sub>/ tonne of ammonia. The average and lowest SEC is 33kJ/t and 29.3kJ/t. Barrier plants are facing in achieving the lowest energy consumption is due to policy and control of the government. Fertiliser industry are now obligated to use Renewable energy and Green hydrogen for production of ammonia.

**Mr Nand** also touched upon the use efficiency of nitrogen. The association is looking forward to the Production Linked Incentive (PLI) for electrolysers and viability gap funding for ammonia users. **Mr Rajeev Kumar** shared BP's contribution to the decarbonisation ambition. BP is working in fore front with a new purpose 'Reimagine energy for people and the planet' and working towards decarbonisation of cities, industries and corporates by collaborating with them. Their ambition is to become net-zero company by 2050 or sooner which envisages to tackle about 415MT of CO<sub>2</sub> per annum; 55 MT from operation require for production and processing for oil and gas, and 360 MT of lifetime carbon emissions from produce. They aim to reduce operational carbon footprint on selling products by 50%.

BP has come out with clear pathway to move from international oil and gas company to a resource provider to integrated energy companies. Reduce oil and gas production by 40%, increase renewable energy production from 2.5 GW to 50 GW by 2030, bioenergy production by 5 times in 10 year, have 20% share in bio jet and 10% share in Hydrogen. Also created a group called Region, Cities and Solutions, to help and support the cities, corporates and industries in meeting their net zero targets. Identified key area to work are: ease in access to green power, reduce carbon footprint of logistics, improve energy efficiency, process decarbonisation, managing the entire energy system from supply to consumption and provide end-end solution using digitalisation.

**Mr Singh** gave his views on the competitiveness of breakthrough technologies in the steel industry by 2040, said that achieving 300MT will require a huge amount of hydrogen, and nuclear power might be helpful to produce hydrogen on large scale. The barriers steel industry is facing on implementing low carbon technologies are lack of resources, funding, schemes on carbon utilisation- their merits and demerits, and incentive on green steel.

**Mr Bodhankar** believes that the market mechanism will provide merits and compensate the effort of industries towards decarbonisation supply-side industry require a government policy, market mechanism and the right pricing of their CO<sub>2</sub> reductions to support their net-zero targets. Fertiliser sector is highly subsidized and regulated by the government. The policy remains as a barrier in introducing the new product to the farmers because of subsidisation. For fertiliser industry, de-regulation is required to allow trade in free market and facilitate new products to farmers, **Mr Nand** said.

**Mr Muthukrishanan** says that the slow paced innovation is a barrier to decarbonisation. Rapid research and development will be able to supplement and help the growth to achieve net zero by 2070, the target laid out by the Prime Minister of India. So, the collaborative efforts of stakeholders, research institutions, academia, and industries are required for moving forward towards decarbonisation and cost competitiveness of the technologies **Mr Kumar** and **Prof Banerjee** concluded.

## Making Words Count @WSDS 2022

“ Societies are changing, world’s carbon budget is finite. Society is not just wanting reliable and affordable but clean energy. Companies and collaborations can show climate leadership by sharing a common purpose of greening and leading India’s energy transition. After all, it’s not about having the change but wanting the change.

**Mr Anshul Mathur**  
**Vice President, Communications and Advocacy, Asia Pacific, bp**

“ Grants or fund flow into the industry, carbon marketing with the right pricing, and trade flexibility in the global market is the necessity for cost competitiveness and technological advancement in cement Industry.

**Dr Arvind Bodhankar**  
**Executive Director-ESG and Chief Risk Officer, Dalmia Bharat Group**

“ Decarbonisation in the existing plants requires large investment and policy support whereas new plants should be built with defined specific energy consumption.

**Mr Lokendra Raj Singh**  
**Chief Operating Officer, JSW Steel Ltd., Vijayanagar**

“ Focus on raw material sourcing, enhancing process technology and low carbon emission in supply chain is needed to reduce overall energy intensity of the sector and the country. Institutions, policymakers and industries should come forward and contribute to Research and development, then only the target to limit warming 1.5 degree Celsius can be achieved.

**Mr M Muthukrishnan**  
**Airport Sector-Head of Environment, Health and Sustainability, GMR Group**

“ Fertilisers is also helping in decarbonisation indirectly by growing more crop and capturing more carbon.

**Dr S Nand**  
**Deputy Director General, The Fertilisers Association of India**

“ Industries will play a much bigger role in India to achieve its emission reduction goal of 1 billion tonnes by 2030. To help the industries, the government need to provide support in terms of policy, incentive and green product premium.

**Mr Rajeev Kumar**  
**VP Regions Cities and Solutions, bp**