



# WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2022

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

February 16-18, 2022 (Virtual)



## Towards Industrial Decarbonization in India: *Key Enablers and Opportunities*

### THEMATIC TRACK SUMMARY

Venue: Kanha

Date: February 17, 2022

Time: 10:00 AM – 11:30 AM (IST)

#### **Suggested Citation**

World Sustainable Development Summit (2022), Towards Industrial Decarbonization in India: Key Enablers and Opportunities, Thematic Track Summary (Rapporteur: Veena C P), New Delhi: The Energy and Resources Institute.

## Actionable Messages

**Message 1:** There is a need to create private-public partnerships (PPPs) and introduce a mechanism to coordinate the relevant stakeholders. These will play a role in fostering innovation and pilot programs in the context of industry decarbonisation.

**Message 2:** Implementing circular economy strategies is essential to achieving decarbonisation, especially in the chemical industry.

**Message 3:** Introducing green hydrogen in various sectors is one of the key technologies towards decarbonization. It is important for India to work with industries to use hydrogen and design pilot projects, with the support of government funding.

**Message 4:** Encouraging new innovations and looking beyond compliances with targets and goals is necessary. Future is focusing on the capability building and systems thinking at execution scale.



## Narrative

Focusing on the critical importance of trajectory of low emission development pathway towards net zero, the session titled, '**Towards Industrial Decarbonization in India: Key Enablers and Opportunities**', started with the necessity of introducing actions early in the area of industrial decarbonization to sustain the momentum towards net zero to compress the emissions within the time frame. As the economy is at an inflection point, the role of private sector in industry is crucial. There is a need of creating mechanism for private- public partnership coordination in the sector. From the perspective of mitigation, the relation between private and public becomes extremely important for partial risk sharing ability. This reduces the interest rates in terms of industrial technological shifts and secondly, it increases the term of borrowing for private players.

Industry being the largest consumer of electricity in India, the focus must be on maximum use of electricity wherever doable rather than the use of fossil fuels. Going forward, the move should be made towards promoting the use of electricity and other non-fossil fuel in the supply chains as well. The ultimate move of India towards decarbonization and towards introducing hydrogen comes with a lot of challenges. In order to address these challenges, India has to move parallel in terms of producing and reducing the cost of green hydrogen. The most important part is working with industries in the use of hydrogen and designing pilot projects, with the support of government funding.

As the energy demand in India is going to double by 2050, there is a need of decoupling the emissions from growth. As industry is a hard-to-abate sector, the discussion moved towards presenting innovation, energy efficiency and renewable energy options across the various industrial sectors. From the perspective of chemical industry, decarbonization is linked with circular economy. The future is focusing on the capability building and system thinking at execution at scale. Secondly, the running innovation and pilot programs in partnership with private sector. Thirdly, work needs to be done on concentrated solar in the form of electricity and heat. The support of green hydrogen is important, but this comes with cost structure challenges therefore is need of thinking in terms of nuclear by the government.

The contribution of cement sector can be divided into two parts, one is reducing the carbon footprint and the second is eliminating the problem. In terms of reducing carbon, the problem lies in the raw materials, which consists of limestone (calcium carbonate) which gets released in form of carbon dioxide to the atmosphere during the process of cement making. This requires different approach for reducing emissions. Therefore, efforts are being made for clinker substitution with lower carbon footprint. There is also shift to alternate fuels in the place of traditional conventional fuels. For addressing the concern of carbon removal, it requires new technologies such as carbon capture and introducing green hydrogen. The problem is that none of technology will be available within 2030 for reducing carbon footprint when the cement industry peaks its carbon emissions. This can be addressed through climate adaptation particularly retrofitting of existing plants. There will be a huge capacity in the future therefore both mitigation and adaptation is equally important.

The Indian steel sector has ambitious plants of capacity expansions, with this comes the problem of carbon intensive energy use since, the steel production majorly uses coal and gas. Few technologies which can reduce the business-as-usual emissions are top gas recycling blast furnace, injection of natural gas or hydrogen for coal-based reduction, use of biomass for emission reduction, melting reduction, 80 per cent of carbon capture. The possibilities of utilising the carbon, capture and use, hydrogen-based steel, use of green hydrogen and renewable technology were yet to explored. The options of 2030 can be easily met by working out Direct reduced iron (DRI) sector abatement by 1.5 tonnes of CO<sub>2</sub>, reduction of 0.7 tonnes of CO<sub>2</sub> can be made for using top gas recycle blast furnace and also 0.7 tonnes of CO<sub>2</sub> for tonne of steel for using hydrogen partial oxidation-based coal gasification. This will result in overall sector emission reduction to 0.57 tonnes of CO<sub>2</sub> per tonne of steel which is close to the 2°C Scenario (2DS) path.

From the perspective of renewable technology, the interest of industries to completely go green will increase if the government provides incentives to fully depreciate the industrial plants and gives tax savings. Also, in terms of transition of technologies, government should encourage role models and greener approach as an integral part in the production process. This approach of green hydrogen and green ammonia will become like the present state of solar and wind. Awareness needs to be increased by central and state government by introducing carbon tax for process emission and

appropriately pricing the carbon price, along schemes like Perform, Achieve and Trade which benefits energy efficiency. This comes to a conclusion of combining five to six technologies in a holistic manner to move towards industrial decarbonization.

Further discussions were on different collaborations that led to field trials for technologies to be validated. The challenges for field trials includes lack of interest by industries for allowing to test and validate the technologies which is fully funded. Therefore, the issues lie in preparing the market ready for an adoption by the industry, also in terms of scaling up to the maximum capacity. The learnings are that the sector should start looking towards innovations and looking beyond compliances with targets and goals. Dialoguing with equipment and process suppliers, and also with government to work collaboratively to meet the targets is necessary. New areas like dairy supply chain and food supply chain should be considered which typically missed out, he mentioned these areas have lots of demand and growth. There is lots of energy consumed in the supply chain, therefore all of these have to be considered as well. In conclusion wider dissemination and adoption has to be made for the process of innovation so that funding can also be generalized.

## **Making Words Count @WSDS 2022**

“ We really to need to work on how to decouple the emissions from growth. For decarbonization, India needs to start shaping and building an ecosystem for this transition.

**Mr Thomas Kerr**  
*Lead Climate Specialist, South Asia, The World Bank Group*

“ In many of the cases, decarbonization processes is deeply linked to circular economy. Climate is one part of the three pillars, which is decarbonization, circularity and biodiversity.

**Mr R Mukundan**  
*Managing Director and CEO, Tata Chemicals Limited*

“ The efforts of big industries as they move forward is spreading out into the small and medium enterprises that is going to make big impacts. Much of effort is going on is in the area of climate mitigation, thought has to be given to climate adaptation as well.

**Mr Shrinath Savor**  
*Chief Sustainability Officer, Shree Cement Limited*

“ The green hydrogen and green ammonia probably will become the most competitive source of greening the industry like what solar and wind are doing today. There is a lot cost misconception around green hydrogen and green ammonia.

**Mr Vineet Mittal**  
*Chairman, Avaada Group*

“ Steel decarbonization, in 20 to 30 years' timeline for phasing out coal is worth considering including China and India. The problem about steel sector is that it is carbon intensive in terms of energy use.

**Prof P. K. Sen**  
*Former Professor & Consultant, IIT Kharagpur*

“ For innovation, start looking beyond compliances and go overboard and set up your goal for 2025-2030. It is important to work collaboratively to arrive at decarbonation targets and goals.

**Mr. Sandeep Tandon**  
*National Project Manager, UNIDO Project – Facility for Low Carbon Technology Deployment*