

Thematic Track: Low Carbon Industry Transition: The role of the Industry Transition in meeting climate objective & Decarbonisation of Hard to Abate Industry Sectors (Steel and Cement)

At the [World Sustainable Development Summit \(WSDS\) 2021 - New Delhi \(teriin.org\)](https://www.teriin.org) the thematic track on “**Low Carbon Industry Transition: The role of the Industry Transition in meeting climate objective & Decarbonisation of Hard to Abate Industry Sectors (Steel and Cement)**” was organized on 12th February 2021 from 1.45 – 3.30 pm IST. The session was in partnership with the Government of Sweden and the Strategic Partnership for the Implementation of Paris Agreement (SPIPA) project. The SPIPA project is funded by the EU and the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU). This session discussed the role of industry transition in achieving the goals of the Paris Agreement with a focus on the Indian steel and cement sectors.

Mr Girish Sethi, Senior Director-Energy Program, TERI stated that the discussion on energy transition is gaining momentum in the past 2 years. He informed that there is a substantial potential for use of Hydrogen in the industrial sector specifically steel and demand for hydrogen will likely increase 5-6 fold by 2050.

Mr Jacob Werksman, Principal Adviser to Directorate-General for Climate Action, European Commission stated that the EU and India share the same goal of limiting global average temperature in accordance with the Paris objectives, though the contexts are different for both in terms of demographics, GDP growth rate and energy demand. Both countries also share the urgent challenge of promoting just transition. The EU has committed to achieve net zero by 2050. With this objective, the EU has raised its 2030 emission reduction targets by 15% increasing the ambition to decrease 40-55% of all GHG emissions by 2030. He focused on the importance of the policy back up for achieving net-zero emission targets and implementation. For that, the EU commission will propose by July 2021 the necessary changes in EU policies. Net Zero means that conventional fuel and related technology need to be phased out and the development of decarbonisation technology must be accelerated. It is also an all-economy approach requiring a comprehensive assessment of the role of all sectors, sources and sinks in approaching the goal. Net zero also means that all financial flows should be aligned with the Paris Agreement from government procurement to private sector investments to export credits and development assistance to investment in R&D. Additional stimulus packages that are being injected into economies to ensure a green recovery from the COVID should be aligned with the same. At the same time the EU is ensuring to have a just transition mechanism by mobilising 100 Billion Euros in support to carbon dependent communities so that no one will be left behind. Net zero requires confronting the challenges of decarbonisation without losing industry. It will require industries to create new markets for climate-neutral products such as steel, cement and basic chemical and to lead this change we need novel and cleaner technologies. To lead on this path, India and the EU both will be investing in clean steel breakthrough technologies including the Zero Carbon steel making process. Under a new Hydrogen Strategy, the EU is going to produce 1MT hydrogen by 2024, will increase this by ten-fold by 2030, and by 2050 will deploy enough green renewable hydrogen to suffice zero carbon steel production. India and the EU are working jointly through the International Solar Alliance (ISA), the International platform on Sustainable Finance, the Leadership Group of Industry Transition, and the Coalition for Disaster Resilient Infrastructure (CDRI) to mobilize private capital towards environmentally sustainable investment.

Professor Måns Nilsson, Executive Director, Stockholm Environment Institute stated that the industrial sector contributes to roughly 30% of global CO₂ emissions. Production processes require some major shifts including increasing recycling and circularity, Reducing demand through material efficiency, energy efficiency in the value chain and reducing combustion process emissions in the production route through Electrification, Biomass and Carbon Capture Utilization and Storage (CCUS). Some of the most discussed transitions are

replacement of the blast furnace by Hydrogen Direct reduction, electrification to shift from fossil fuel, rebuilding cement kilns from CO₂ from gases etc. He also focused on the need for investment to provide infrastructure and assets required to transition the heavy industry to net zero. Investments are manageable to provide the infrastructures for example Co-financing through national just transition fund and are not that large if compared to global savings. He mentioned the criticality of international collaboration to reach the Paris agreement goal. One such initiative is LeadIT hosted by India and Sweden. LeadIT creates a platform where government and industries can cooperate in accelerating global industry transition. Other Collaborative initiatives are Mission Innovation Platform, The Climate Group roadmap 2050 and Clean Energy Ministerial.

Dr Ajay Mathur, DG, TERI stated the importance of the steel and cement sector in the economy of India. He said that the major challenge is to make steel and other industries carbon proof.

Mr Pradip Kumar Tripathi, Secretary, Ministry of Steel, Government of India in his keynote address shared insights about the Indian steel sector and India's commitment towards lowering emissions. He said that the focus of the ministry is to address the issues through the adoption of low carbon iron and steelmaking and technologies for carbon capture, utilisation and storage in its endeavour to reach zero carbon footprint in coming decades. According to National Steel Policy, India's crude steel capacity is planned to increase from 142 to 300 million tonnes per annum by 2030 to meet the demand of the growing urban infrastructure and manufacturing sector. India has been a party to the UNFCCC and has always been at the forefront of all its treaties and agreements to address climate change. On 7 July 2020 during LeadIT meeting at COP 25, India has also signed the joint ministerial statement to accelerate the low carbon industry transition. The Ministry of Steel has also undertaken measures to lower the carbon footprint of the steel sector such as Promotion of energy efficiency, implementation of NEDO model projects, Research and development to facilitate the reduction in GHG emission, recycling of industrial waste and reducing the associated environmental impacts. The average CO₂ emission intensity of the Steel industry was projected to reduce from 3.1 tonnes per ton of crude steel in 2005 to 2.64 tonnes per ton of crude steel by 2020 and 2.4 tonnes per ton of crude steel by 2030. This is approximately 1% per year and the target for 2020 is already achieved. India's Finance minister laid out Vehicle Scrapping Policy in Budget 2021-22 for supplementing domestic scrap, as scrap route is less emission and energy- intensive. He also mentioned Coal gasification based direct reduction as alternative technology due to the abundance of non-coking coal in India though the issue of being emission intensive will persist in the near term. Availability of Natural gas will be limited, and the large-scale production of Hydrogen will continue to be a challenge in the near term. CCUS has a limitation in India due to geographical limitations and the risk of seismic activities in various regions. Hydrogen produced from electrolysis can be an important alternative provided it is produced from renewable energy. This process is energy and water- intensive, so India would require maximising water recycling for this. He mentioned that the low cost of renewable energy will meet the availability of low-cost hydrogen in the future. The Hydrogen Energy Mission has been announced in budget 2021-22. This will lay the foundation of the development of a Hydrogen based economy.

Ms. Richa Sharma, Joint Secretary, MOEFCC shared challenges in the Industry transition, the views and ongoing action of the ministry and initiatives of LeadIT in India in her opening remarks. She said that preserving the health of the people and its planet indeed requires the transition of all the sectors of the economy including hard to abate sector. The transition must be technically feasible but also affordable. Considering the urgent need, the Leadership Group for Industry Transition (LeadIT) initiative was hosted in collaboration with Sweden and India during the United Nations Secretary General Climate Summit 2019 in New York. The aim of this initiative is 'To bring companies and countries together to develop low carbon pathways for transition within the companies and countries'. LeadIT provides the platform for sharing

know-how of technologies and learnings for commercialisation of those technologies. Industry transition roadmap by LeadIT also captures India's cement sector SDGs roadmap prepared by the Cement Sustainability Initiative (CSI) of 13 leading companies. It has conducted studies and produced briefs covering various aspects of industry transition. It analysed NDCs of 134 countries, which concluded that less than 50 countries, including India, have concrete action for industry transition. Private sectors can play an important role in creating low carbon sustainable economies. Government and Industry partnership in India is already working to capitalise on the potential of energy efficiency, resource efficiency and renewable energy to drive the transition and contribute to overall emission reduction. To lead in that path around 24 leading Indian companies reaffirmed the commitment to take voluntary action in achieving India's NDC goals in India's CEO Forum on Climate Change organised on 5 Dec 2020. Limited affordability and accessibility of cutting-edge technologies are the key challenges faced by industries. This requires investment and collaborative partnerships between countries and the private sector to drive innovative research and development, commercialisation and scale-up of cutting-edge technologies like Green hydrogen, Direct Air Capture, CCU etc. Countries require providing an adequate policy framework and establish the market for green products to accelerate the desired transition such as the market for green steel, which carries a premium on cost. Through LeadIT and other platforms including UNFCCC, India continues to push fore for technology transfer and climate finance to support the industry transition in particular in emerging economies.

Mr. Will Hall, Visiting Fellow, TERI presented the pathways to decarbonise the Indian Iron and Steel sector focusing on Hydrogen based Direct Reduction route as the most promising option for India. The reason being the hydrogen economy is receiving attention due to the falling cost of Renewable electricity and electrolyzers and coordinated action on climate change. With appropriate policy support, the Indian steel sector can put itself on a path towards net-zero emissions by 2060.

Mr. Kaustubh Phadke, General Manager, Global Cement and Concrete Association, India, informed that India's cement plants have exceeded PAT (Perform, Achieve & Trade) targets by over 80% by saving 1.5 Mtoe against the target of 0.8 Mtoe. According to GCCA's Low Carbon Technology Roadmap for Indian Cement Sector few pronged approach to meet the targets are Energy efficiency (thermal & electrical), Waste Heat Recovery System (WHRS) installations, Use of alternative fuel & raw materials, Clinker factor reduction, and Newer technologies (CCUS, Oxygen enrichment etc.). He mentioned that globally 19.2% reduction in CO₂ emissions/ tonne of cementitious material and 40% in India since 1990 was achieved. 'GCCA members commit and aspire to deliver society with carbon neutral concrete by 2050. It will work across the built environment value chain to deliver this aspiration in a circular economy, whole life context' he stated.

Mr Tobias Winter, Director, Indo-German Energy Forum, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) while mentioning the latest developments in the steel and cement sector in the EU informed that 7 out of 8 major steelmakers have pledged to achieve net zero by 2050. EU companies are focusing on energy efficiency, steel scrapping, fuel switch to biomass/natural gas and use of hydrogen produced via electrolysis or carbon capture. The recycling rate of packaging steel is increasing and is currently around 80% all over the EU. The price of CO₂ allowance in the EU is around Rs. 2000/tCO₂ currently and for transitioning to hydrogen route the price should reach Rs. 5000/tCO₂ or above. Few initiatives are going on with funding from the European Union with business associations, consulting firms and steel companies' collaboration. One of them is the Responsible Steel Initiative where 40 members from business and civil society pledged and committed to standards and certification of steel value chain. Solidia Precast Concrete and Vertua Concrete is already producing cement with 70% and 50% CO₂ reduction and the former has announced achieving 100% net zero cement by 2030. The European Cement Association is aiming at 30% CO₂ reduction by 2030.

As part of the panel discussion, **Ms Madhulika Sharma, Tata Steel Ltd** highlighted the key challenge in the near term and probable solutions in terms of incentivising demand for green steel, policy regulation and finance. Steel is a capital-intensive sector and capital allocation is a big dilemma. In addition, technologies are available but are expensive. She informed that most of the sustainable finance and green finance goes to the renewable energy sector and this should be mobilized for reducing emissions from the steel sector as well.

Mr. Arvind Bodhankar, Ultratech Cement shared about challenges faced by the cement sector in India and Ultratech's approach in tackling them. According to him, 60% of CO₂ emission is from the calcination process, 30% from fuel and 10% from electricity. Ultratech is undertaking fuel switch measures such as biomass, low emission factor fuel to replace conventional fuel that is coal to reduce emission through fuel. He also stated that there are limited ways to reduce the larger portion of emissions coming from the calcination process currently. The company is also exploring electrification kilns and carbon capture and utilisation technology.

Dr. Gökçe Mete, Stockholm Environment Institute highlighted the issue of just transition and finance availability. Support from traditional communities, technology transfer and climate finance are needful actions for industry transition. Co-financing can address the finance related issues. Technologies that are emerging need to be adapted in the local context. That also requires investment in research and development to accelerate at the same time creating low transition cost. Setting up new technology is a window of opportunity, but it comes with political, economic and socio-economical issues. She emphasised the necessity of skill development for use of new technologies. LeadIT is also going to launch this year an interactive 'How to guide' for decarbonisation roadmaps and will work together with local partners in doing so.

Mr. Uday Gupta, Managing Director, Adhunik Metaliks Ltd / Liberty House Group was optimistic in terms of achieving industry transition in future. Liberty Steel aims to become carbon neutral by 2030. He stated that the coming generation is responsible enough and will support premium on green products to support industry transition.

Ms. Dina Lanzi, Head - Technical Business Unit Hydrogen, SNAM on her lookout about the future stated that they are studying the possibility to mix Hydrogen and Natural Gas in pipelines in future to make Hydrogen fuel accessible to the industry. Their gas pipeline is ready to transport pure hydrogen in about 70% of the 33000 km pipeline.

The video recording of the session is available at: [\(153\) Thematic Track: Low Carbon Industry Transition - YouTube](#)