



JSW Steel unlocking India's sustainable future with robust decarbonisation roadmap

In early 2023, JSW Steel, one of India's leading steel manufacturers, joined ResponsibleSteel, the global multi-stakeholder standard and certification initiative for responsibly sourced and produced steel. Committed to making steel more sustainable, JSW assumed the responsibility towards making our planet better and becoming a frontrunner in driving decarbonisation both at home and globally.

As the company takes a giant stride forward on their journey of decarbonisation and sustainable development, Green Steel World (GSW) sat down with Mr Prabodha Acharya, Chief Sustainability Officer, JSW Group, to discuss the ambitious sustainability targets, the strategy in place to achieve them, the roadblocks and India's role as one of the largest consumer markets in the world and much more.

By Tanya Rudra

According to a World Economic Forum study, India is poised to become the world's third-largest consumer market by 2030, behind the US and

China. Throughout the world, the demand for steel rises directly in proportion to the rate of urbanization and India is expected to be no different in

this regard. Forecasts suggest that the steel demand will continue to peak in the most populous country in the world for decades to come.

To meet the growing demand, steel production in India is expected to nearly double by 2030 and almost quadruple by 2050. However, steelmaking in India is highly carbon-intensive, representing almost 10-12% of the country's CO₂ emissions. As India strives to increase its production, it also faces the challenge of a national target of net-zero emissions by 2070. Consequently, the onus is on the country's major producers to make a transition to greener technologies.

Mr Acharya answers some key questions to showcase the steps to usher India into low emissions growth pathways and what this transition will look like.

Here are the excerpts from the interview.

A dichotomous situation

The population growth of India is not a threat, but a massive opportunity. India has a relatively young population which makes it one of the largest labour forces in the world. However, the dichotomy of this situation is that as consumer demand and aspirations continue to rise, India cannot afford to further increase emissions.

So, as a rapidly growing economy, we are working to reduce our emissions. India

is committed to significantly reducing emissions by 45 per cent by 2030, from the 2005 level. We are only the second country in the world to meet its last NDC (Nationally Determined Contributions) commitment.

An updated NDC was communicated to the United Nations Framework Convention on Climate Change (UNFCCC) at the 26th session of the Conference of the Parties (COP26) in Glasgow. India's updated NDC also reaffirms its commitment to work towards a low carbon emission pathway, while simultaneously endeavouring to achieve sustainable development goals.

However, it would be unfair to compare India's emissions reduction trajectory with the developed economies of the world. It is a fundamental principle of the Paris Agreement that we all work towards limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C, but the approach and pace will be country specific. Therefore, India has set a target to achieve net zero by 2070, while most of the developed world plans to achieve it by 2050 and China by 2060.

Embarking on a new journey

By partnering with ResponsibleSteel we have



Mr Prabodha Acharya, Chief Sustainability Officer, JSW Group.

begun the process of getting all our facilities certified against their standard. As there is no universally accepted definition of green steel, we are currently aiming to reduce our carbon footprint as much as possible.

The government of India is working on putting forth a unified definition of green steel and we at JSW Steel are pushing for a methodology for low-emissions steel, which can be termed as green steel.

In the absence of a definition and clear mandate, we are proposing a lower-emission steel production route.

In India, the emissions from the steel industry are relatively higher than the global average because we are still heavily reliant on the primary method of steelmaking. The inferior quality of iron ore requires excessive use of reductants like coking coal or coke, resulting in higher emissions.





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Being proactive, not reactive

By the end of this decade, we aim to reduce our emissions intensity by 42 per cent, taking 2005 as the base year. To achieve this, we have identified some key initiatives and levers.

The long-term goal is to align ourselves with India's NDC and IEA's (International Energy Agency) Sustainable Development Scenario. Our long-drawn-out target is to limit global warming to around 1.7°C. Although it is not the preferred 1.5°C scenario, it is still below 2°C and is Paris-compliant.

The plan:

- **Use renewable energy to phase out thermal coal** – An integrated steel plant emits massive amounts of high-temperature and high-pressure exhaust gases

which can be used for power generation. By installing a TRT (Top Recovery Turbine) on a BF (Blast Furnace) and a CDQ (Coke Dry Quenching) in a Coke oven, waste gases and waste heat can be captured. Around thirty-five per cent of our energy needs are already being met by this method, while the rest is sourced from the national grids/captive units that usually rely on coal for power generation. We have estimated, considering our growth aspirations, we will be installing around 10 GW of renewable energy to meet our demands. We aspire to run our steel operations entirely with RE by 2030.

- **Reducing coking coal consumption** – The most widely used reductant to separate oxygen and iron emits massive amounts of CO₂ into the atmosphere.

The sure shot way of reducing dependence on coking coal is increasing the iron content in iron ore. We are heavily investing in the process of beneficiation that enriches the quality of iron ore and thereby reduces coking coal use.

- **The hydrogen route** – Injecting green hydrogen as a reductant hasn't begun yet but, in the meantime, we are going to use biogenic carbon instead. We plan to set up a green hydrogen plant and once the cost of production comes down, we will scale it up.
- **Increased usage of scrap** – In India, the availability of scrap is a major concern. We are a growing economy and on average, steel takes almost 40 years to become scrap. Steel consumption in India is still quite low. We are using 10-12 per cent of scrap that is generated within the steel plant. We are working on adding another 10 per cent to the mix.
- **Carbon Capture Utilisation and Storage** – We are already operating a 100 TPD CCU system in one of our DRIs. We are closely monitoring the results and plan to scale up when it becomes cost-effective.



JSW Group aspires to run its steel operation entirely with RE by 2030.

- **Carbon circularity** – In ironmaking, carbon is injected into the furnace in the form of coking coal to separate oxygen from iron ore. The resultant pig iron is then further refined to produce steel. The carbon dioxide or carbon monoxide coming out of the chimneys can then be captured and used as syngas. So, we don't need to add fresh coking coal but use this gas many times over for the reduction process.

Unlocking a sustainable future

One of the biggest roadblocks in India's path to the electrification of the steelmaking process is the scarcity of scrap.

Although the country's steel consumption is on an upward trajectory, the market is still relatively new as compared to

that of the US or Europe, where steel is being produced for over 200 years.

In India, we have abundant low-grade iron ore reserves but to produce DRI (Direct Reduced Iron), which is a cleaner version of iron, green hydrogen would be needed at an industrial scale. When DRI is produced with green hydrogen, the emissions are almost zero. For this transition to happen, a reduction in the cost of hydrogen and the availability of high-grade iron ore/pellets are mandatory.

Therefore, in the near future, you cannot expect all of the steel to be produced with green hydrogen but will be a combination of various technologies.

Moreover, the government is planning to introduce a Green

Steel Policy through which demand for low-carbon steel will be created. Unless there is an obligation, no one is willing to buy green steel at a premium price. Currently, in India, there is no legal obligation to reduce CO₂ emissions, there is no direct carbon tax and there is no consumer demand.

JSW Steel has already committed around 1.4 billion USD to decarbonise and meet our 2030 target but if there is no market and no regulatory pressure, it does not make commercial sense.

Effective transition is possible only with the government's support in the form of grants and policy changes. As far as JSW Steel is concerned, we have undertaken this herculean task for the sake of society and to help fight climate change.

