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Vivek Agrawal

Chattisgarh the fastest growing major steel hub in the country

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D. A. Chandekar
Editor

Dear Readers,

I am quite happy about the way Indian iron & steel industry is recovering from the global pandemic of covid-19. As we all know, 'steel' is one of the core sector of the economy and is important input to many important industry sectors like infra, construction, white goods, auto, engineering, etc. Thus the performance of steel sector affects so many industry verticals and finally has a big impact on overall economy of the country.

In the first few months of unlocking, the steel production was superseding the demand. This was natural as the steel producers were running the plants where as the construction activity was almost closed, infra projects were completely halted and hardly any vehicle was being sold. In fact many automakers were themselves involved in the noble work of manufacturing safety equipments for the people. The exports surged during this period. But now gradually the steel demand is moving up and the industry balance is getting restored.

Now that the industry is back on recovery track and cruising ahead decently, there are few other challenges peeping in. Firstly, even if the demand is recovering fast, the supply chain which was disrupted at many places has not been healed properly. Many points including the logistics has to be improved further. Secondly, this pandemic has created lot of stress and pressure within global economy and has tremendously increased the competition. This necessitates the need to produce better quality at competitive prices. Thus the producer has to adopt smart manufacturing techniques, or Industry 4.0 as is commonly referred to in India, to enhance efficiency, productivity and thus improve the bottomline of the company. Mind you, Industry 4.0 is not a just a fashionable word but the smart way of inducting the sustainability in the organisation. Sooner or later, everybody has to adopt it.

Another important outcome of covid-19 is the total change in the mindset of individuals as well as the corporations. Now, going to office everyday looks unnecessary. Instead, working from home throughout the week and going to office may be once a week looks normal. Also, planning a business tour for fewer meetings may not look professional. Video meeting or conversation completely serves the purpose. Although, most of the restrictions imposed during the lockdown are now lifted, the local trains in Mumbai and public transport systems in many metros are not fully on track. This has forced many corporations to outsource many of the professional functions which is going on smoothly. This situation has drastically reduced the need to have big number of permanent employees and also of a big office premises.

Indeed, the post covid world is different, interesting and off course challenging. One has to face it with a smiling face !

Write your comments : https://steelworldblog.wordpress.com/

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Yuxing top fired stove with a catenary dome achieved monthly mean HBT of 1314.7 oC

Reference of Yuxing Top Fired Stove for BF with volume 40-50% of China's steel capacity since 2017 to April

Sr. No	Client	BF no	Blast volume Nm3/min
1	Hebei Zongtie Steel	1	7800
2	Hebei Zongtie Steel	2	7800
3	Hebei Zongtie Steel	3	7800
4	Hebei Zongheng Steel	3	8400
5	Hebei Zongheng Steel	4	8400
6	HBIS LaoTing	1	9700
7	HBIS LaoTing	2	9700
8	HBIS LaoTing	3	9700
9	Tangshan RuiFeng Steel	4	8000
10	Tangshan JinXi Steel		6300
11	Tangshan JinXi Steel		6300

Notes: China accounts for 50% of the world's steel capacity, and Hebei
Since 2017 to the present moment, Yuxing top fired stove adoption rate
Total reference nos of Yuxing top fired: 550.

Low nox emission - temperature difference between dome
than 83mg (international standard less than 150 mg)
from 83.5-88.9% (9-10% greater than that for other top
Long life span - Application practice has proven that the
years (the lifetime of the catenary dome combustion
High HBT - Monthly mean HBT of 1314.7 oC delivered
than that by other stove under same conditions)
combustion technology, the lower the better concept is

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Henan Yuxing Engineering & Technology of Hot Blast Stove Co
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Efficiency, Long Lifetimes & International Leading Technology

Conventional 3-section top fired stoves for 3x2500m3 BFs converted into Yuxing 4-section top fired by cutting the top portion of the existing stove shell

over 2000m3 at Hebei Province which accounts for 2019, adoption rate of Yuxing top fired up to 84.6%.

	Stove type	Blast time mins	HBT oC
	Yuxing 4-section	45	1250
	Yuxing 4-section	45	1250
	Yuxing 4-section	45	1250
	Yuxing Caternary	45	1250
	Yuxing Caternary	45	1250
	Yuxing 4-section	45	1250
	Yuxing 4-section	45	1250
	Yuxing 4-section	45	1250
	Yuxing Caternary	45	1250
	Yuxing 4-section	45	1250
	Yuxing 4-section	45	1250

province accounts for 40-50% of China's steel capacity.
for BFs with volume over 2000m3 in Hebei reaches to 84.6%.

and HB at 30 oC approximately, nox emission less
Higher thermal efficiency - Thermal efficiency ranging
fired stove)
lifetimes of catenary dome have been in excess of 44
chamber of Yuxing stove over 30 years)
(HBT delivered by Yuxing stove is 15-20 oC higher
Lower air excess - 1.05-1.06 (Associated with
not always right)

3x3580m3 BFs configured with Yuxing 4-section top fired stoves

Internal combustion chamber stoves for 1497m3 BF at JianLong Steel converted into Yuxing top fired with a catenary dome

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Chattisgarh the fastest growing major steel hub in the country

"The iron and steel industry needed a comprehensive planning for modernisation, up-gradation of technologies, replacement of obsolete equipment and removal of technological imbalances" Vivek Agarwal, CEO, Godawari Power & Ispat Ltd – A flagship company of Hira Group.

Agarwal is a Metallurgical engineer and Masters degree (MBA) in HR with total 30 years rich experience in iron and steel industry. Before Joining Hira Group he served Jindal Steel & Power Limited for marathon 22 years.

At JSPL he was instrumental in commissioning, and successfully stabilising all the 350 TPD and 500 TPD DRI plant at 110% level in the most cost effective and environment friendly manner, he had been a person who thrust on safety, environment, and greenery for ultimate productivity and performance as he believes safe and clean working environment keep peoples morale high.

Innovations and creativity are his biggest tool.

Due to his outstanding contribution in the growth and development to steel industry by optimization of operations, Series of innovative work and modifications in design to maximize the performance of plant and lot of work in safety, environment, and productivity in steel.

On the emerging trends and post-covid impacts on the Chattisgarh Steel hub, D A Chandekar, Editor & CEO, Steelworld had an interaction with Vivek Agarwal, CEO, Godawari Power & Ispat Ltd –A flagship company of Hira Group to under the present situation about Chattisgarh state, to understand the impacts of Covid-19 on the Chattisgarh State steel units etc. Agarwal also highlighted the major challenge for steel industry is how fast govt can bring the supply of major raw material that is iron ore to normal level by expediting production level of mines which had been auctioned in 2020.

What is the present situation in the steel plants in the state of Chattisgarh ?

Steel industry holds a major position in the arena of Indian industries and Chattisgarh is one of the youngest and fastest-growing state of India, Today Chattisgarh had emerged a steel hub in the country.

Chattisgarh Steel industry has a reputation of producing high quality steel that have a high export value, there are more than 100 steel rolling mills, sponge iron plants and Ferro-alloy units in Chattisgarh. The advances machineries, tools and equipment used in the iron and

steel industry of Chattisgarh also help in producing quality steel..

The government of Chattisgarh has also opened its doors to private investors who wish to set up new steel plants in the State by providing industrial land at reasonable rates and also through government's incentives directed towards thrust industries, mega projects and small-scale industries.

With such a significant step, the State government has already covered a considerable journey towards becoming the ultimate steel hub of India. Chattisgarh being the centre of India and rich in raw material always had added advantage over other states, here labour is also skilled and cool, this also helps in efficient operations, logistically also all places of Chattisgarh are well connected with Rail and Road as such gives upper hand to steel industry and makes best destination for steel sector.

Off-course corona pandemic story had been bad for Chattisgarh too but all this was unavoidable and finally we had learned to live with corona by changing our lifestyle.

Redefining of life had helped us in timely revival of steel plants in present situation and now Chattisgarh is doing big and ruling the India's steel market.

What problems steel industry in CG faced during the pandemic ?

To stop the pandemic on its vicious path, the nation has been put under extended lockdowns where steel industry has been barely able to function efficiently under such constraint, absence of workers or logistical support created roadblocks.

Acknowledging the fact that the pandemic has caused immense damage to the country's economy and robbed people from their employment, Chattisgarh is also not untouched with this situation and baring few almost all steel plants came to standstill from 20 days to 45 days. In such an adverse scenario the State government in Chhattisgarh put best efforts to bring on track the back bone of economy in the state and revival had been fast to minimise the damage, due to foresightedness of people of entire state , the steel industries are getting back to normal after a big setback in 2019-20 end as well as beginning of 20-21. CG Govt further overhauled the state industrial policy to provide attractive incentives to entrepreneurs for setting up businesses.

Fear of imposition of intermittent lock downs if Covid cases show a steep rise. This had badly affected continuity in working and operations round the clock, this had been a time of uncertainty.

Stopping of public transport had been a major setback though it was unavoidable, this also created severe problem for workers movement and made them bound to move from one state to another without any conveyance this had been highly painful.

Fear in workforce and availability of workers, since most of the work force has returned back to their home towns and are not expected back early. All this had automatically reduced productivity and time being lead to strain on both top and bottom line.

Please share your experience in bringing the company and the plant operations back on track.

A safe and effective restart of operations is crucial and this pandemic had given the new challenges The key initiative taken by us to deal with and begin operations are as follows:-

SAFETY:- Management teams at production units had drawn up a comprehensive plan to ensure on-site safety of the machine and workforce. The first task for us was ample supplies of sanitising material—disinfectants, liquid hand soaps, sanitisers, and Personal Protective Equipment (PPEs) like

masks, gloves, hair nets, etc., while undertaking 'deep sanitisation' of the entire plant.

A thermal screening system for employees and visitors had been implemented. In addition to daily screening, a database consisting medical records of employees and their families, tracking their current medical condition and any existing illnesses or diseases also maintained.

People continue to be the centre of response to Covid-19. As such continue dialogue between Mgt and employees continued through video-conferencing to get feedback and suggestions.

Implementation of all SOP'S as per guidelines from CG Govt and MHA New Delhi, Continuing normal working while maintaining "social distancing" .

Fear in workforce and availability of workers, since most of the work force has returned back to their home towns and are not expected back early- As we have strong bonding with labour and we also know that without workers we are nothing, management of Godawari took care of their workers and staff in all respect as a result it took very less time to bring plant on track with 100% production level.

Since our business is greatly dependent on road/railway logistics to cater domestic requirements and transfer of finished material as such it had been a tough time to pass through, however with the strong leadership at top and dedicated team work , we had been able to revive our operations with strict adherence of all SOP'S and guidelines and bought plant to pre-covid level in fastest possible time. Now we are delivering ever-best perfomance on all front.

What is your advice to fellow plant owners and managers on post COVID-19 Strategies ?

Pandemic like Covid-19 is a new unique experience. It has now redefined our life and taking steps that demand greater level of communication, care and empathy. I visualise that time is highly challenging for us and we had to live with covid and this unique experience had opened our eyes and had made revolutionary changes in our life,

Physical distancing , use of mask, keeping away from crowded places, avoiding unwanted outing, eating home food, maintaining hygiene , washing hands regularly , avoiding touching nose and face, improving immunity etc are some key habits which had become part of our life and needs to be sustained. People working in the organisations are most important and they had to be be taken care at utmost level to meet their need of life. We should not avoid any practice rather our approach had to be redefined. Safety of man and machines had to be the biggest priority to keep moral of people high and performance of plant at peak.

What support does the steel industry in CG require from the state as well as central govt?

- The Indian steel industry has entered into a new development stage, post de-regulation, riding high on the resurgent economy and rising demand for steel. Huge scope for growth is offered by India's comparatively low per capita steel consumption and the expected rise in consumption due to increased infrastructure construction and the thriving automobile and railways sectors.
- The iron and steel industry needed a comprehensive planning for modernisation, up-gradation of technologies, replacement of obsolete equipment and removal of technological imbalances.
- Presently, the government is trying to support the industry through the RBI's strategic debt restructuring scheme.

Breaking new ground with cutting edge technology

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Ranked amongst India's topmost companies in terms of its robust financials, NMDC's eco-friendly, scientific and safe mining operations have earned recognition for it not just as the world's lowest cost producer of iron ore, but also as the leader in its category. In step with the changing times, NMDC Ltd., has shifted from being a single commodity, single customer and limited mining operations to supplying multiple commodities to several customers across distant geographical locations.

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But it needs long-term finance, such as, pension funds, savings etc. which can withstand cyclical volatility of profits unlike funding from banks or capital markets.

- Anti-dumping duties on cheap import to protect domestic producers.
- More focus on infrastructure and automobile industry to increase domestic demand and job creation to counter-balance global slowdown.
- Servicing of bad loans by government to provide capital and reviewing the credibility before dispatching the loans.
- Increase in foreign investment.
- More emphasis on Green Climate Fund to procure environment friendly technology.
- Expediting iron ore mining to address raw material (ore) crisis.
- Transparent and honest working, proper reward and award to deserving steel plants.

How do you see the future of steel sector in India, short term and long term ?

On the back of sustained domestic demand, India's steel industry witnessed robust growth in last 10–12 years. Since 2008, production has gone up by 75% while domestic steel demand has grown by around 80%. Steel-making capacity has also increased in tandem, and the growth has been fairly organic. The Indian government has always supported the steel industry and introduced the National Steel Policy in 2017, which envisions the growth trajectory of the Indian steel industry till 2030–31. The broad contours of the policy are as follows:

- Steel-making capacity is expected to reach 300 million tonnes per annum by 2030–31.
- Crude steel production is expected to reach 255 million tonnes by 2030–31, at 85% capacity utilisation.
- Production of finished steel to reach 230 million tonnes, assuming a yield loss of 10% for conversion of crude steel to finished steel – that is, a conversion ratio of 90%.
- With 24 million tonnes of net exports, consumption is expected to reach 206 million tonnes by 2030–31.
- Govt aggressive spending on infrastructure.
- As a result, per capita steel consumption is anticipated to rise to 160 kg.

From all this, steel future looks robust in short and long term, only challenge is how fast govt can bring the supply of major raw material that is iron ore to normal level by expediting production level of mines which had been auctioned in 2020.

What are the future plans and strategies of Ispat Godawari Power &Ispat.

1. Safety and environment are the prime objective at Godawari power , Every single tonne production had to be safe and green production.
2. To make Godawari power &ispatltd no 1 company in its profile of operations w.r.t Environment, beautification and cleaning.
3. To operate plant at optimum production level with all key parameters intact.
4. To make GPIL a debt free company by march,2022.
5. To reward all its shareholders in the best possible manner.
6. Once GPIL become debt free, potential to be explored for expansion with internal cash generations.

Steel manufacturing processes prove their mettle with automation

Today's steel manufacturer is facing a number of challenges that range from safeguarding competitiveness to meeting changing customer needs with flexibility and speed. These require steel plants to maximize operating performance while maintaining quality and yield and controlling maintenance and inventory levels. In addition, companies need to find ways of retaining expert human knowledge accumulated over many years, after the experts themselves come towards the end of their working lives. In this regard, automating certain processes not only ensures consistency of control, but also enables processes to operate smoothly in the absence of human operators, right around the clock. Advanced Process Control (APC) using model predictions is one of the ways to run the processes on autopilot mode with minimum intervention from operators.

Tarun Mathur,
Global Product Manager, Metals Digital, ABB Ltd.

Digitalization: the power of partnership

To best realize the advantages of digitalization, steel manufacturers require a partner with in-depth knowledge and experience of not only the available digital technologies, but also the industry's specific processes. This integration of OT and IT expertise ensures digitalization projects do not simply look

good but provide efficient return on investment (ROI). When selecting a digital transformation partner, it is crucial to choose a company with domain, industry and process knowledge, preferably with many years' experience working with third-party and legacy integration. Specific capacities, such as the ability to apply cutting edge tools, including cloud integration, advanced analytics, and artificial intelligence, together with proven development models, including profitable methods of joint working, are also critical.

Advanced Process Control

The concept of APC, and the ways in which it can be tailored to industry-specific processes - given the right level of knowledge and expertise - offers great potential for a metals industry seeking solutions that provide tangible and guaranteed returns. Today, APC is fundamental to the success of certain processes within many industries and ABB is one of the very few companies offering APC for metals industry at this time, that is increasingly being applied in steel production.

Although it is technically advanced and not without complexities, APC can be considered simply as the autopilot for driving the plant to an optimum state around the clock. It is traditionally based on Model Predictive Control (MPC), a technology with proven ability to provide control solutions using constraints, feed-forward and feedback to handle multi-variable processes that feature delays and processes with strong interactive loops. Using a plant model and objective functions, MPC can predict system behaviour some steps into the future – put simply, it produces a digital twin of any process and predicts the way it will act.

Based on this predictive functionality, APC can automatically adjust operational set points to ensure peak plant performance and productivity. Its ability to make frequent, small changes, avoids large corrections or over-compensation for changes in conditions, creating a stable process, before steadily and smoothly moving to and maintaining an optimal operating state. In this way, APC is able to enhance quality, raise throughput, and reduce energy use.

Following the implementation of APC in a range of other industries - including cement, mining, and pulp &paper - and working together with steelmakers, ABB has now developed APC applications for metals plants covering processes that pose clear and established challenges to steel plant operations. ABB Ability™ Advanced Process Control for metals offers powerful applications like optimizing the pellet plant dryer and indurating machine burners that reduce the need for manual monitoring and adjustments while optimizing productivity and energy consumption.

Optimizing the pellet plant dryer

Pellet plant dryers face a range of operating challenges, including intermittent disturbances in feed rates, long process delays, and variations in the calorific value of the blast furnace gas (which makes temperature control difficult).

Temperature limits are, therefore, often not met, resulting in insufficient drying of the material, negatively impacting energy consumption and productivity. Moreover, control of the drying kiln with conventional PID controllers is unstable, mainly due to process delays.

For example - At an Indian steel plant, a technology company was tasked with maintaining the outlet temperature at the desired setpoint, irrespective of the above challenges. APC was implemented with dryer outlet temperature as the controlled variable and fuel

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flow as the manipulated variable. A model of dryer outlet temperature was developed based on plant data to include the fuel flow control valve and disturbance variables, such as feed rate. The model is used to predict the upcoming control performance, calculating setpoint corrections, which are then downloaded to Level-1 PID controllers.

APC now maintains the dryer temperature even with changes in feed rate and process delays, achieving a 10% reduction in the standard deviation of the temperature.

Controlling the indurating machine burners

Optimization of the global steelmaker's indurating machines also posed a problem, due to the high interaction between control loops, as well as variation in feed rate, machine speed and bed height, which interferes with temperature control in the firing zone. This can result in fluctuations in the firing zone temperature up to +/- 30°C, making it difficult to maintain the burn-through temperature of the pellets.

To resolve these issues, it was necessary to stabilize the temperature profiles of eight burner zones.An offline model of burner zone temperature was developed, including fuel flow control valve and disturbance variables, such as bed height. The model was used to predict control performance in the near future, calculating setpoint corrections that were then downloaded to Level-1 PID controllers.

As a result, the steel manufacturer benefited from a 15% reduction in the standard deviation of the temperature profile along the indurating machine burner zone.

This helped ensure that burn-out temperature is reached at the right location, improving the quality of the pellets. It has also reduced temperature variation, leading to a reduction in fuel consumption in the burners.

Conclusion

Given the ever-challenging conditions in the steel market, intelligent plants that remove ambiguity and eliminate guesswork represent the future of the industry, by placing every aspect and detail within the control of skilled operators. APC is an essential part of that intelligent plant – indeed, it is the intelligence that makes a plant smart. By accurately modelling process conditions using Model Predictive Control – and ultimately AI and other advanced technologies – APC is able to predict and respond to multi-variable conditions in a way that is beyond any human operator. In doing so, it is a vital tool for those human operators in maintaining peak productivity and performance consistently.

As APC technology continues to evolve, the potential of AI with reinforcement learning neural networks, as well as edge and cloud technology, is now being explored to provide a set of Advanced Process Control and analytics services for monitoring, predictive analytics and closed-loop control. However, this can only be truly successful where the partnership between those undertaking these complex processes, and those supplying APC expertise is based on a deep and common understanding of the challenges and requirements of specific industries.

ABB Ability™ Advanced Process Control for metals is built on the three core pillars of digitalization – a unified, connected, data-led ecosystem; smart algorithms, deep analytics and AI to translate data into actionable insights; and with deep domain knowledge, such a solution offers the paradigmatic

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Cokemaking Technology of Large Capacity Stamp- Charge Battery

Shi Zhengyan and ***D P Deshpande*** of ACRE Industrial Solutions Pvt Ltd, Kolkata.

Preface

The first push of XintaiZhengda 6.78m stamp-charge battery in April, 2018 marks a significant progress of China's cokemaking technology in using large capacity stamp- charge battery, which has reached production up to 1.9 million t/a.

The 6.78m stamp-charge battery is of large capacity coke oven which represents the first class technology level in the world. With advantages such as mature and advanced technology, airtight and proper refractory structure, large volume oven chamber, less land occupation, high quality coke, high thermal efficiency and automation level, sound environmental protection measures, and lower investment per ton of coke, etc., it represents a leading position in the world in aspects of refractory oven block, coke oven machinery, process equipment, automation and environmental protection level etc.. After commissioning and being put into operation, the 6.78m stamp-charge battery has reached its expected performance.

With an increasingly strict environmental policy, China's coking industry is undergoing transformation and upgrading, including phasing out backward productions and building large-capacity batteries with high efficiency and environment-friendliness. According to the statistics, the proportion of stamp-charge batteries has increased to 40% in the production by newly-constructed coke oven batteries due to its remarkable merits of saving high quality coking coal.

1 Configuration

In China, the large-capacity stamp-charge batteries under construction are mainly 6.25m and 6.78m. The main design parameters for the three sizes of stamp-charge batteries, i.e. 5.5m, 6.25m and 6.78m are shown in the table below.

Tf sjbnf no.	Ef t dsjqujpot	6/6n !t ubn q-charge battery	7/36n !t ubn q-charge battery	7/89n !t ubn q-charge battery
		KOEL66-07	KOEY4-6.25	KOEY4-6.78
2	Dpl joh! chamber dimensions L×W×H (mm)	26: 91†665†6661	28111†651†7281	29751†685†77: 4
3	Dpbsntdbl f ! dimensions L×W×H (mm)	261210263 21†	272110273 61†	287110289 11†
		611†6431	581†6: 11	611†7561
4	Dpbsntdi bshf ! per oven, t dry coal	52/1	56/86	69/33
5	Df ou sl distance of coking chamber (mm)	2461	2611	2761
6	Dzdnfl!un f ! of coke oven (h)	36/6	36	37/6
7	Boovbntdpl f ! output per oven/t	21531	22971	25351

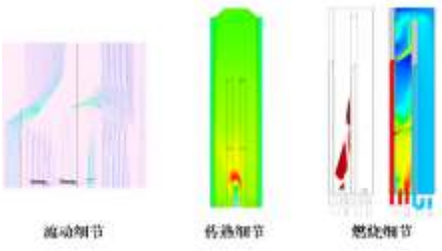
2. Refractory oven block of stamp-charge battery

The refractory oven block is the critical subject that ACRE has been attaching importance on in recent years, in particular some techniques used for 6.25m and 6.78m stamp-charge batteries are taking leading position in the world, such as twin flue (hair-pin), regenerator in compartment, multi-stage heating, waste gas circulation, lean gas and air side-entry, COG underjet, emission reduction from source, low-energy consumption for cokemaking, air-tight refractory oven block and long service life, etc..

2.1 Emission reduction from source

1）Simulation technology for combustion in vertical flue Simulation platform of vertical flue combustion is established to simulate the combustion situation inside the vertical flue of coke oven combustion chamber based on the effect of temperature field, fluid field and pressure field to optimize the refractory oven block and heating system design so as to ensure even distribution of coke oven heating in vertical direction, reduce heat consumption for coke making, minimize NOx

emission and graphite formation at root of



See the figure for simulation of vertical flue combustion for oven heating system

2）Multi-stage heating plus high efficiency waste gas circulation and low NOx combustion technology

The following technologies such as multi-stage heating plus high efficiency waste gas circulation and low NOx combustion, optimized multi-stage burner numbers, multi-stage air-intake ratio, burner height and heating gas outlet size, would have more efficient waste gas recirculation, better dilution of the combustible gas concentration, distributed combustion and reduced combustion intensity so that combustion temperature can be lowered and NOx formation can be effectively reduced.

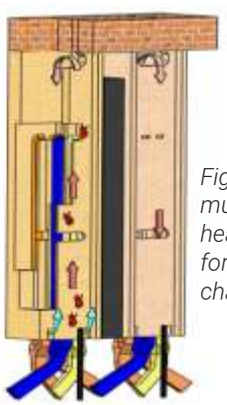
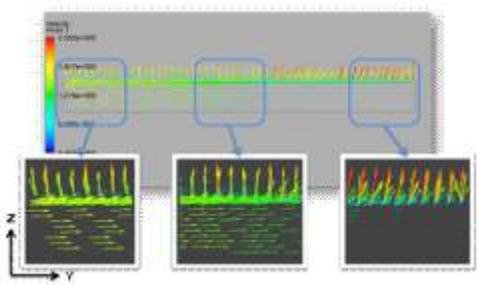


Figure of multi-stage heating system for combustion chamber

3）Regenerator in compartment technology

The regenerator is divided into compartments in direction from P.S. to C.S. Each compartment is adjustable through adjustable hole underneath to control the air flow distribution plus simulation method so as to have a better distribution of MG and air in longitudinal direction in the regenerator, more uniform air flow distribution in longitudinal direction of the combustion chamber and the best uniformity of coke oven heating in longitudinal direction of coking chamber.



2.2 Cokemaking technology with low energy consumption

1) Optimization of combustion system

After the combustion system is optimized, the thermal efficiency can reach the highest in the entire coking process; the temperature of the standard flue is determined according to the owner's production capacity; the temperature of the oven top free space is controlled at about 820°C; the generation of graphite is reduced; the recovery rate of byproducts is high.

2) Long-life oven wall with high working efficiency

Taking into account both structural strength and heat transfer efficiency, the oven wall has good thermal conductivity, high thermal efficiency and high structural strength, which can prolong the life of oven wall and reduce energy consumption during coke oven heating, while reducing the temperature of the vertical flues so as to reduce SOx&NOx from the source.

3) New type of checker brick with high working efficiency

After the design of the checker brick is optimized, the new type of checker brick has the characteristics of large heat exchange area and high heat regeneration efficiency as per unit volume, which can effectively increase the temperature of preheated gas and air, reduce heat loss, and improve heat exchange efficiency.

2.3 Tightness and long life of coke oven proper

1) 3D design technology for coke oven proper

The precise 3D design can realize the optimal design of the coke oven proper to make the oven structure tight and reasonable and avoid leakage of the oven proper. The high strength of the oven proper prolongs the

service life of the coke oven.

2) Tightness and long life of regenerator

The construction of the main walls and single walls of the regenerators strongly bonded with tongues and grooves to ensure long life and leakage-free. In the low-temperature area of the regenerator, the surface of the silica bricks is covered with clay bricks, and the upper high-temperature area is built with silica bricks. There is no sliding layer in-between, which effectively avoids the leakage caused by the direct joints of the sliding layer in the regenerator. The protection wall of the regenerator has a multi-layer structure. A one-piece sealing board and heat insulation material are placed between the silica brick and the clay brick so as to improve the integrity and tightness of the protection wall; the new type of thermal insulation coating applied on the outer surface of the protection wall ensures the tightness and heat insulation effect, besides, it is easy for maintenance during production.

3) Tightness and long life of oven chamber and combustion chamber

The paving bricks of the oven chamber are thickened and the abrasion resistance index of the bricks is improved. The large brick design is convenient for maintenance. The taper design of the oven chamber is reasonable to reduce the abrasion of the oven wall during the coking and pushing process so as to prolong the service life of oven proper.

4) Tightness and long life of oven top

The oven top is built with sliding layer structure, which makes the high temperature zone and low temperature zone on oven top slide separately, avoiding the leakage and improving the working environment of the operators.

5) Tightness and long life of combustion chamber end

When coke is pushed, the large fluctuations in temperature occur on the oven chamber end wall, making the wall peel off easily. Based on this situation, the combustion chamber end is built with double-layer structure, the outer layer is high alumina brick, which has good thermal shock resistance and corrosion resistance, and the inner layer is made of silica bricks. Partial joint between silica bricks and high alumina bricks overcomes the inconsistency of high-direction expansion during heating-up and avoids the leakage of raw gas from the oven end at the initial stage of startup.

6) Oven door and ascension pipe lined with bulk castables

It replaces the conventional lining bricks with bulk castables on oven door and ascension pipe, which not only effectively improves the structural strength and reliability in operation, but greatly reduces the brick joints, tar adhesion and is convenient for cleaning and routine maintenance.

3 Production process of stamp-charge battery

3.1 Increasing the stability of coal cake

Stamp-charged coke-making requires the coal cake not to collapse, nor partially fall when transferred from the stamping box to the coking chamber. Otherwise, the coal charging and oven production will be impacted. The stability of coal cake, therefore, is of vital importance. Collapse rate is used to judge the coal cake stability. After taking effective measures, the cake will not collapse and the corner chipping only happens occasionally.

Measures for increasing the stability of coal cake:

1) The most suitable coals for stamping: gas coal (with 60% - 70% volatile matter) or 1/3 coking coal, blended with coking coal and lean coal (with around 30% volatile matter); and the caking index Y is 11 - 14mm.

2) Fineness degree of

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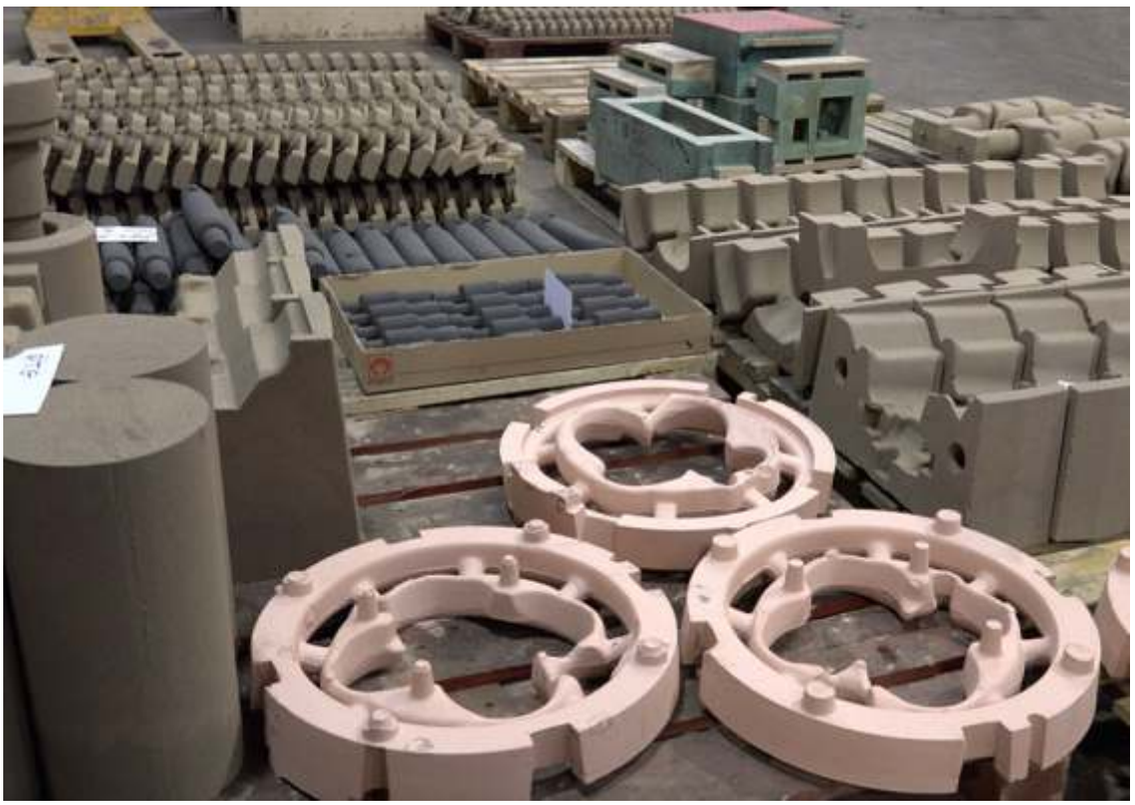
stamped coals shall be kept at: ≤ 3mm for 90% - 93% of coals; and ≤ 0.5mm for 40% - 50% of coals. Before blending, the pre-pulverization shall be performed on coals that are difficult to crash.



3) Moisture content of stamped coals shall be 9% - 12%, and 10% - 11% at the best. If moisture is not sufficient, the water-spraying device shall be added at the belt conveyor of coal. Also, the water-proof shelter for coal shall be installed to prevent excessive moisture in the rainy season.

4) Coal types for blending shall be kept as stable as possible. Frequent changes on coal types are prone to impact coke quality and production.

5) The stamping machine shall have sufficient stamping work, which refers to the mechanical energy put into the cake by the hammer. Generally, the unit stamping work is applied to indicate the work put into unit weight of coal. The unit stamping work has the greatest impact on the stability of coal cake. Bulk density, shear strength and compression strength of the cake all depend on it. If the unit stamping work is considered together with the reasonable setting of stamping procedures, the coal cake will become more stable.

The coal cake weight and height have been increasing as large capacity coke ovens are becoming more popular. To ensure the stability of coal cake and the working efficiency of coke oven machines, the stamping machine shall reach the relatively large stamping work within a short period of time. For example, the stamping time of the machine applied in the 6.78m stamp-charge battery in China is seven minutes; and the stamping work is 790 J/kg.

6) Slenderness ratio of coal cake

With the improvement of mechanical properties of the stamping machine and further studies on the stamped coal blending, the slenderness ratio of the coal cake has been gradually increasing. At present, if the slenderness ratio is smaller than 13, the collapse rate is less than 1/1000.

3.2 Charging emission control technologies

In the stamp-charged coke-making, the coal cake is pushed into the coking chamber when oven doors on the coke side and the pusher side are open, in which case smoke and fire are easy to occur. With the development of charging

emission control technologies, emissions will not be discharged into the atmosphere in the stamp-charge battery. At present, the well-developed technology is the combination of gas transfer car with double U-shape ducts, high pressure ammonia liquor spray technology, oven end de-dusting station, pressure regulation system of single coking chamber and pressure stabilization system of gas collecting main.

1) Gas transfer car with double U-shape ducts

The gas transfer car with double U-shape ducts is able to connect the coking chamber in charging stage with its two adjacent coking chambers in final coking stage. The charging emissions enter into the gas collecting main through standpipes and goosenecks of the three coking chambers, which is equivalent to increasing the gas flow and guiding more dusts to the gas collecting system.

2) High pressure ammonia liquor spray

The high- and low-pressure ammonia liquor spray nozzles are installed at the gooseneck. They are used to spray high pressure ammonia liquor to reduce emissions during charging and to spray low pressure ammonia liquor to cool the raw gas during coking. Dimensions of the nozzles are determined according to battery type and experiment results. In case of low pressure, the nozzle can guarantee the ammonia liquor flow and its fogging effect; while at the high pressure, the nozzle will be used to form the negative pressure of around -800Pa at the gooseneck. The sufficient negative pressure will make charging emissions easier to enter the gas collecting main.

3) Pressure regulation system of single coking chamber

The pressure regulating device, installed at the channel where raw gas enters gas collecting main, is the core of the oven pressure regulation system. In the case of charging and initial coking, emissions are huge. At that time, the pressure regulating device is in maximum opening and with minimum resistance, which makes the raw gas go into the gas collecting main more smoothly. During the coking period, the raw gas is getting less and the opening of the pressure regulating device is becoming smaller. Till pushing, the device will be completely closed.

If it is equipped with the pressure regulation system of single coking chamber, the pressure regulating device will work to ensure that the pressure at the bottom of the coking chamber is larger than 5Pa at the end of coking stage. Therefore, the pressure value of the gas collecting main can be set low or even under negative pressure; and the emissions sprayed by the high pressure ammonia liquor will be collected to the main more easily.

The pressure regulation system of single coking chamber (CPS or OPR for short) developed by ACRE combines the technologies of optimized pressure control of gas collecting main, high pressure ammonia liquor spray and automatic pressure regulation of coking chamber so as to realize the dust-free charging and accurate pressure regulation of all coking chambers during the whole coking period.

The control principle of CPS and OPR is similar to PROVEN by UHDE and SOPRECO by PW, but they differ in the pressure regulating device. Referring to put-into-production projects in China, OPR, PROVEN and SOPRECO are all applied in the top charging coke oven, only CPS applied in the stamp-charge battery. These four systems all have been used well in those projects, and all are suitable for both top

charging and stamp-charge batteries with the view of system principles. But at present, CPS develops more mature in the stamp-charge battery, and the other three more mature in the top charging coke oven.

4) Gas collecting main (GCM) pressure stabilization system

The stability of GCM pressure is the premise of stable operation of single oven chamber pressure regulation, and also the necessary condition for smokeless coal charging of stamp-charge battery.

The GCM pressure is a multivariable system with the following features, such as serious coupling, serious nonlinear and time-varying characteristics, large amplitude fluctuation and intense disturbance change. It is difficult to build an accurate mathematical model of the system. ACRE adopts the hybrid intelligent control method such as advanced control algorithm, fuzzy control, decoupling control and expert system to develop a set of host computer configuration software specially used for pressure control of GCM, which rely on the network technology and coexist of the hybrid intelligent controller and the original system PID controller.

The pressure stabilization system of GCM is adopted. The deviation is more than 75% within rangeof ±20 Pa of the set value and more than 96% within the rangeof ±40 Pa of set value, which can quickly eliminate the large pressure fluctuation during coal charging.

5) Oven end emission control

For stamp-charge battery, the pusher side oven door is open while charging. In order to prevent a large amount of air from being sucked into the oven and the gas collecting system, slight positive pressure should be maintained at pusher side oven door, so that a part of the charging emission will escape from the pusher side oven door, which requires to be eliminated to meet the environmental requirements.

At present, the proven-successful oven end emission control process is that theSCP machine is equipped with sealing frame which presses on the face of buckstay, and the emission escaping from the pusher side oven door moves upward through the gap between the sealing frame and the coal cake. The dust collecting hood is arranged directly above the oven door, which is connected to the de-dusting duct and ground de-dusting station, and the suction is generated by the fan of the ground de-dusting station. The upward charging emission is sucked into the dust collecting hood, which enters the ground de-dusting station through duct and will be discharged into atmosphere. In order to reduce the influence of lateral wind on de-dusting effect, wind shields are arranged on both sides of the SCP machine.

The position of the de-dusting duct can be arranged either on the top of the pusher side buckstay or on the ground outside the pusher side track of the coke oven. In order to enhance the de-dusting effect, an induced draft fan can be added at the dust collecting hood directly above the oven door to increase the suction at the mouth of hood.

3.3 Waste gas external circulation technology (WEC)

Based on the computer numerical analysis and industrial test of the temperature, pressure and flow field in the combustion chamber before and after waste gas return ACRE has developed the waste gas external circulation (WEC) technology. It automatically re-distribute a certain proportion of the waste gas from the waste gas flue to the updraft of the waste gas box, by diluting the oxygen content in the combustion air, the combustion speed are slowed down and heating intensity are reduced, and the flame in the vertical flue is elongated and

the flame front temperature is reduced.

Test result shows that the effect of this technology is obvious when the battery is heated by coke oven gas, which can reduce the NOx in waste gas by 30-40%. However, the effect of reducing NOx is not obvious by using this technology when the battery is heated by mixed gas.

The returned waste gas can only enter the updraft of when the reversing function is available, the reversing modes that have been put into use include header butterfly valve reversing mode and the branch pipe butterfly valve reversing mode; The branch pipe reversing mode, installing one waste gas return pipe on coke side and pusher sider each, has the advantages of less space occupation, which could make the daily operation and maintenance of the basement more convenient.

3.4 Automatic battery heating technology

The automatic battery heating technology mainly includes automatic temperature measurement system and control system, and the function of coking process management can be added according to requirements.

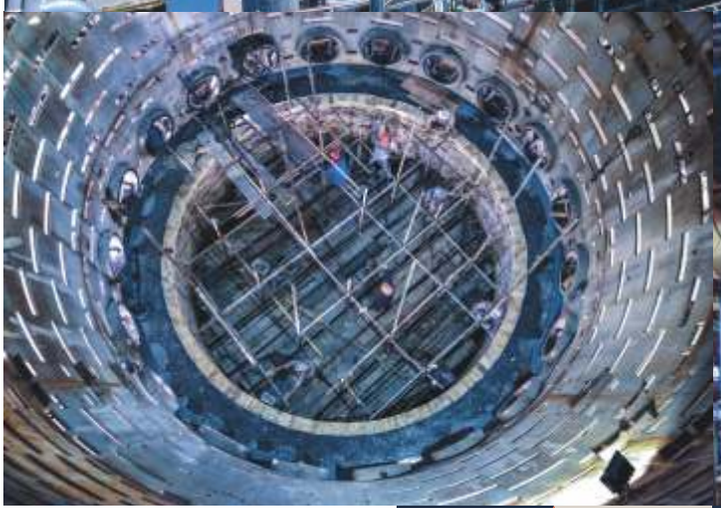
The automatic temperature measurement system can automatically measure the temperature of reference heating flue on oven top, which is used to automatically control the gas flow and the suction of the side waste gas flue, and display the uniformity coefficient and stability coefficient.

Control and adjustment system simulates operators making manual adjustments for battery heating, according to the results of automatic temperature measurement, the opening of gas header valve, gas branch pipe valve and side flue damper can be automatically adjusted. The purpose is to adjust the heat timely according to the change of production conditions, and to keep the oven temperature stable against various interference. The temperature control system of coke oven vertical flue is a typical system with large inertia, nonlinearity and time-varying characteristic parameters. In the production process, it is often interfered by factors such as pushing delay, change of coking time, fluctuation of coal quality and charging coal moisture. Fuzzy control algorithm is adopted to control the fluctuation of oven temperature within the range of ±7 of standard temperature.

Coking process management can realize real-time monitoring of raw gas temperature and trend, automatic calculation of net coking time and socking time, provide net coking time and socking time analysis of whole battery, and also collect relevant data such as manual temperature measurement, automatic temperature measurement, pushing and charging time, charging quantity, coal moisture and other relevant data, so as to assist operators in analyzing coke maturity status.

3.5 Technology of waste heat recovery from ascension pipe

Heat generated from raw gas takes up 36% of all energy consumption during the coking process. It can be partially recovered while producing saturated steam by adopting the waste heat recovery technology from ascension pipe. It is of great significance to companies with high demand of saturated steam. For example, coke oven with annual production capacity of 1.5 million tons of coke, can produce 180~200 thousand tons of 0.6～1.0Mpa saturated steam (RMB 120 yuan per ton), with economic output of approximately 21.6~24 million yuan each year. The ascension pipe temperature will be dropped from 280~300 to 40~50 to improve the operating



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ANSWER 08

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Tata Steel Europe recently postponed the revamp of IJmuiden BF #6 until after 2021, achieving then **a campaign life over 35 years**, and producing over 80 million tons of hot metal (bosh and stack area).

Also at IJmuiden, BF #7 which started its current campaign in 1992, is not scheduled for relining before achieving 30 years of operation.

The ultra-long campaign life is particularly impressive as these furnaces are operating at **ultra-low coke** (down to 250 kg/tHM) and high-productivity rates (3.5 tHM/ m^3WV.24h). This is achieved through **ultra-high levels of pulverized coal injection** (250 kg/tHM). Furthermore, the furnaces are **operating at over 98% availability** and with fluctuating raw materials properties.

Among those choosing this design are POSCO for its 6095 m^3 Gwangyang #1 -the worlds largest blast furnace, Russian Severstal, MMK and Metalloinvest, and Vietnamese Hoa Phat.

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environment on the oven top. The comprehensive energy consumption, which is equivalent to over 10 kilos of standard coals, will be reduced for producing per ton of coke, or 17,900 tons for producing 1.5 million tons of coke in total per year. And nearly 53,000 tons of CO_2 will be cut accordingly.

4 Conclusion

1) Combined with the technical results of stamp-charge battery and successful experience of large-capacity coke oven, especially the large-capacity stamp-charge battery both at home and abroad, ACRE has developed the large-capacity stamp-charge battery with advanced technology, high automation and excellent environmental protection facilities. This type of coke oven developed by ACRE has many advantages. It has a long service life of the refractory oven block, wide adaptability to coals, less land occupation and less manning. In addition, it can operate with high efficiency and in an environmental-friendly manner, and produce high-quality coke at low costs.
2) Stamp-charge battery for cokemaking is adopted in a way that high-volatile caking coal can be used as much as possible. More coking coal will be saved when producing the same quality coke to lower production costs. And coke quality can be improved by using the same coal blend.
3) Large-capacity stamp-charge battery of new type is highly advantageous in its refractory oven block strength and stability, thermal efficiency, energy conservation and emission reduction as well as service life.
4) It is equipped with the SCP machine which has the most comprehensive functions and advanced techniques. Thus the operating efficiency of stamping machines has been greatly enhanced.
5) Moisture and size composition of the coal to be stamped can be controlled. The appropriate particle size shall be determined based on the coal properties. Various techniques, such as continuously automatic coal feeding, coal cake width increasing and height-width ratio reducing, have been applied to significantly enhance coal cake stability. Meanwhile, various measures have been foreseen in case of accident.
6) Environmental technology has become a key indicator for assessing whether the coking techniques are full-fledged enough. For the stamp-charge battery, the P.S. oven door stays open for a long time during coal charging. Charging emission control becomes difficult due to the height of oven door and big door openings. It then evolves as a major issue for the Eco-production and technical development of large-capacity stamp-charge battery. With advanced design concepts, ACRE has broken the bottlenecks of environmental techniques against the intermittent and continuous escape of emissions. It also shows that the well-proven technologies for the large-capacity stamp-charge battery are appearing a prosperous future!

SAIL Chairman calls for more synergy amongst CPSEs for furthering Atmanirbhar

The CII Apex Council on Public Sector Enterprises is a platform of all CEOs of Central PSEs which meets every quarter to decide on issues of common interest and works towards the benefit and growth of the PSEs. This initiative is a reiteration of the importance that CII attaches to the important role of PSEs in the growth of the Indian economy, as a part of the Industry.

CII continuous endeavour towards the Public Sector Enterprises had organised PSE Summit 2020 on 27th November 2020 which was chaired by Shri Anil Kumar Chaudhary, Chairman, SAIL and Chairman.

The aim of the summit was to discuss more on 'PSEs: Furthering Atmanirbhar Bharat'. During the welcome address, Shri Anil Kumar Chaudhary emphasized on the significant and irreplaceable role by the Indian Public Sector in strengthening Country's self-reliance and for realizing the dream of Atmanirbhar Bharat. He said that, “Increasing self-reliance is the cornerstone today for better economic performance and that is why Atmanirbhar Bharat has become so close to our thoughts and actions and today's summit is marked to celebrate the very spirit of Atmanirbhar Bharat”.“Perform or Perish' is the key that has gripped both the Industry in general and PSEs in particular”, he added.

He commented that the entire PSE fraternity and the industry captains attending the summit would echo his confidence in the abilities of the Indian Public Sector in furthering the spirit of self-reliance.

The Summit had various sessions revolving around the spirit of Atmanirbhar Bharat in the era of globalization for different PSE sectors. Several industry doyens participated in these sessions where deliberation on various ingenious ways of contributing towards self-reliance took place. Shri Chaudhary interjected during these sessions and gave his valuable opinions and enriched the discussions.

In the valedictory session, he emphasized on strengthening the cost competitiveness, internal decision making and the project implementation capabilities of the PSEs for their improved performance. “There are ample opportunities for CPSEs to create a synergy amongst themselves to improve their performance and contribute robustly towards Atmanirbhar Bharat”, he signed off.

Policy Update

India extends anti-dumping duty on steel products from China, US

India has extended anti-dumping duty on imports of cold-rolled flat products of stainless steel of width 600-1250 mm and above 1250 mm of non-bonafide usage, from China, Korea, European Union, South Africa, Taiwan, Thailand and the US, till January 31, 2021.

The extension had been announced by the Central Board of Indirect Taxes and Customs (CBIC) through a notification dated December 3.

The duty was first imposed in 2015 and was under review by the Directorate General of Trade Remedies (DGTR) since September 2020. CBIC said in the notification that the extension had been granted after request from DGTR, which had undertaken a sunset review investigation on imports of certain stainless steel products imported from China, South Korea, European Union, South Africa, Taiwan, Thailand and USA.

Raw Material Update

Steel industry's iron ore shortage charge 'artificial', say miners

During the fourth week of November 2020, Iron ore miners responded to iron ore shortage which is a artificial shortage following the steel industry's allegation that the steel making raw material is in shortage in the country at present.

The domestic steel industry has been petitioning the government for imposing a ban on iron ore exports, at least for the time being, in view of the scarcity and spiraling price of the raw material.

Last week, steel minister Dharmendra Pradhan said a short-term ban on iron ore exports was under consideration.

In a letter to the steel ministry, the Federation of Indian Mineral Industries (FIMI) said of the total 29 million tonne (MT) exports between April and September of the current fiscal, about 19 MT of ore were of lower grade which domestic steel companies do not use. Also, a majority of such exports were from the 163 MT stocks, as on March 31, 2019, lying at mine-heads.

Against the annual total iron ore requirement of 165 MT, the domestic production is around 240 MT, thus the talk of scarcity is “artificial”, said FIMI.

Jindal Steel self-reliant in coal with mine win

Jindal Steel and Power Ltd (JSPL) plans to stop coal imports and end buying the dry fuel from Coal India Ltd from next year following its successful bidding of Gare Palma IV/1 mine in Chattisgarh in the recently concluded commercial mining auction.

"We hope to get the mines by April. At present, we import about 2 million tonnes (mt) and buy about 5mt from Coal India. We plan to stop the import of coal and also stop buying from CIL as the Gare Palma mine would cater to the needs of the plant. We would be self reliant, I would say," Vidya Ratan Sharma, managing director of JSPL told The Telegraph.

The mine in Chattisgarh is located near the company's 3.4GW coal-fired power plant, with JSPL offering the state government 25 per cent of the revenues to win the rights. Gare Palma is estimated to generate Rs 652 crore revenue to the Jindals on reaching peak rated capacity, which is 6mt a year.

Before the deallocation of coal blocks in 2014, the mine was operated by the Naveen Jindal company.

Sharma said the country has huge coal reserves and these could be used optimally with the gasification process, a technology promoting clean energy. Stating the commercial mining auction would reduce the dependence on CIL, the JSPL MD said it would help those who did not get the mines to buy from the PSU.

Apart from cutting down on imports, JSPL is looking to divest its mines in Africa and Australia as part of its plans to become a debt-free company. JSPL has many coal and iron ore mines in Africa, especially in South Africa, Botswana and Mozambique, and coking coal reserves in Australia.

JSPL's debt right now is Rs 29,000 crore and it would come down to Rs 24,000 crore by April, Sharma said.

Nava Bharat Ventures Shares Gain 6% On Conversion Agreement With Tata Steel Mining

Nava Bharat Ventures share price gained 6 percent intraday on December 3 after the company entered into a conversion agreement with Tata Steel Mining.

The company has entered into a conversion agreement with Tata Steel Mining Limited (TSML), a wholly-owned subsidiary of Tata Steel (TSL), with which similar arrangement subsisted, for the conversion of high carbon ferrochrome.

The duration of the conversion agreement with TSML is from December 1, 2020 to March 31, 2025.

The agreement postulates that the entire smelting capacity of the Odisha plant is dedicated to TSML to produce up to 70,000 metric tons of high carbon ferrochrome per annum.

Thereby, the arrangement should provide long-term operational stability for the Ferro Alloy plant and associated Captive Power Plant at Odisha, company said in release.

Iron ore prices hurtle to a seven-year high, coking coal prices lag on quotas

For the key steelmaking ingredients of iron ore and coking coal, it was a tale of two different markets this week.

The price of iron ore punctured the $US120 per tonne ($164.70/tonne) barrier this week, its highest since early 2014

This was on account of a stronger market for steel in China which is targeting massive investment in its infrastructure.

For the 62 per cent grade iron ore fines product, spot prices were transacting around $US121.75 per tonne, according to Metal Bulletin.

A week ago, iron ore cargoes delivered to ports in China were trading around $US116.85 per tonne, the price reporting agency said.

There are market indications that China's demand for iron ore will remain strong over the course of the

economic cycle.

A dozen Chinese steel companies have struck long-term supply agreements with Fortescue Metals Group (ASX:FMG).

The deals were agreed on the sidelines of the China International Import Expo and included FMG shareholder, Hunan Valin Iron & Steel Group.

Other steel firms in China such as Baotou Iron & Steel Group, and Rizhao Steel also signed agreements for FMG's iron ore.

"China's steel industry continues to outperform expectations, with crude steel production in the nine months to September 2020 reaching 782 million tonnes, and annual steel production expected to exceed 1 billion tonnes in 2020," FMG chief executive Elizabeth Gaines said.

Prices for steel products in China climb on rising demand

Steel product prices in China are starting to rise, as are futures prices for hot rolled coil and reinforcing bar in China.

The price of steel reinforcing bar (rebar), which is used in construction and concrete, rose to $US605 per tonne, this week.

This is up $US22 per tonne on a week ago, according to reports.

Fresh environmental restrictions on steel plants in Tangshan are also creating demand for higher-grade iron ore.

Higher quality iron ore commands a higher price in the seaborne market, and the cost flows through the supply chain to consumers; in this case, steel mills in China.

Iron ore shipments to China are on a roll

China's imports of iron ore increased in October to 106 million tonnes, representing a rise of 15 per cent on-year.

"China's demand for iron ore imports has increased on the back of strong steel demand and positive steel mill margins," said analysts at Commonwealth Bank of Australia in a report this week.

Beijing has primed its economy with stimulus money to offset a decline in activity from COVID-19 restrictions earlier in the year.

"China's infrastructure sector has led China's steel demand growth due to policy support after COVID-19," said the analysts.

Meanwhile, Brazil's iron ore shipments to China have started to increase again after hitting a seven-month low.

Vale, the South American country's largest shipper of iron ore, has plans to increase its exports with new mine projects.

Port-side stockpiles of iron ore in China have risen to 129 million tonnes as of last week.

Hard coking coal prices trade sideways in uncertain market

The price of hard coking coal at the Queensland shipping terminal of Dalrymple Bay was steady week on week at $US95 per tonne.

A Panamax shipment of hard coking coal with an early December loading time was heard sold in the market at $US107 per tonne.

Cargoes of Australian coking coal for delivery to ports in northeastern China were heard at $US125 per tonne, up $US12 on week.

Traders said Chinese importers appear to be taking more shipments of coking coal from North America, despite its higher price.

There is market speculation that China is preferring to book cargoes from Canada and the US over Australian cargoes.

Coking coal futures prices point to tightening supply

Futures contract prices for Australian coking coal on the Chicago Mercantile Exchange (CME) are trading in contango.

For December settlement, the futures price is U$122 per tonne, rising to $US134 per tonne for January 2021 and has hit $US173 per tonne for March 2021.

A steep price contango, whereby prices steadily increase, indicates a growing supply shortage next year — in this case of Australian coking coal.

This potential looming shortage could trigger significant price rises for Australian coking coal in 2021.

Immediate outlook for coking coal prices is mixed

Latest import figures show a slowing in the international trade for coking coal into the Chinese market.

China imported 13.7 million tonnes of coal in October, both thermal and coking, and the total was not broken down by category.

This represents a sharp year-on-year decline of 47 per cent, and a drop of 27 per cent on September's imports total.

“The fall in China's coal imports reflects China's coal import quotas,” said analysts at Commonwealth Bank of Australia in a note.

China has strict annual limits on volumes of coal imports allowed to enter the Asian country and Beijing regulates the import trade.

This is because China tries to safeguard its own coal industry from competition from coal exporting countries.

“Policymakers [in China] are reportedly targeting total coal imports of ~270 million tonnes in 2020, implying a 29 per cent on year fall in China's coal imports is required in November and December,” said the CommBank analysts.

Industry Outlook

Steel companies to witness a blockbuster Q3

India's larger steel companies are set to deliver a blockbuster performance in the third quarter of this fiscal as rising steel prices, low input costs and recovering domestic demand drive their margins to multi-year highs.

With the monsoon season over and a visible pick-up in economic activity across the board, industry analysts expect steel companies to stage a comeback in the second half of the year.

“Indian steel spreads have risen by about 25% in Q3FY21 and are at a three-year high," as stated by the Motilal Oswal research report.

“We expect spreads to stay strong on the back of a domestic demand recovery and higher regional prices.

The improvement in EBITDA / tonne (earnings before interest, tax, depreciation and amortization) should be even higher on an improving sales mix, lower exports and higher value-added sales."

Domestic steel firms raised prices of the metal four times in October and November, but have managed to keep them lower or, in some cases, on a par with the landed cost of imported steel as global prices strengthen.

For instance, the price of hot rolled coil, a key flat steel product, rose roughly 10% in November to Rs.47,000 per tonne, while prices of rebars, a measure of the price movement in long steel products, rose 13% to Rs.44,000 per tonne.

As global rates have continued to tick higher on the back of Chinese appetite for the metal and hence we expect that steel producers will be able to continue to raise prices in the coming months as well.

Fitch Ratings Outlook 2021: Global Steel

As per the recent Fitch's Global Steel Sector Outlook report stated that Improving China was quick to strongly support its domestic economy in response to the downturn triggered by worldwide lockdowns.

Fitch analyst report on steel output in China predicted with an all-time high of 980 million tonnes (mt) in 2020 and 2021 (up by 72mt from 2019) due to demand from infrastructure and construction.

In the rest of the world, economic stimulus measures were more moderate and steel production lower by more than 100mt for an estimated output of 745mt in 2020. We expect activity levels to reach pre-pandemic levels towards end-2022 outside of China, with forecast output of 815mt in 2021.

The approval and deployment of vaccines against COVID-19 in Europe and North America, where the pandemic continues to disrupt society and many steel companies have been challenged by high cost bases and overcapacity, should reduce downside risks from the demand forecast.

A global recovery in key end-markets (such as automotive, manufacturing, construction and infrastructure) and some consolidation in major steel markets will increase capacity utilisation and support margins in 2021, leading to Fitch's view of an improving outlook. Rating Outlook: Stable The portfolio includes six issuers on Negative Outlook and three on Positive Outlook. Earnings and cash flow generation for those entities as per 2020 interim results have been better or in line with our rating forecasts. Stabilisation of Negative Outlooks is dependent on management teams prioritising debt reduction over capex and dividends, but a qualitative assessment indicates that potential negative and positive rating actions could be balanced.

Industry News

SAIL posts 7% growth in crude steel production in November

Steel Authority of India Limited (SAIL) has reported a 7 per cent growth in its crude steel production during November 2020. Production stood at 1.417 million tonnes in November 2020 compared to 1.328 mt in November 2019.

Commenting on the performance, Anil Kumar Chaudhary, Chairman, SAIL, said, "The performance during November 2020 is reflective of the continuous efforts being put in by the SAIL Collective to bounce back to pre-Covid levels coupled with the improvement in market conditions."

"With the focus on seizing the opportunity provided by the current buoyancy in the market, SAIL has taken a number of initiatives towards increasing its sales in both domestic as well as exports market. This has helped the company in bringing down the inventory levels as well as deleveraging its balance sheet to a large extent. The company is confident of further consolidating its position in the market in the times to come," he added.

JSW Steel sweetens offer by Rs 400 cr to close Bhushan Power deal

In a bid to cash in on the steel upcycle, Sajjan Jindal-controlled JSW Steelhas offered to make the upfront payment to lenders of Bhushan Power & Steel to close more than a three-year corporate insolvency resolution process (CIRP). Additionally, the offer is being upped by Rs 400 crore to sweeten the deal.

The proposal was made during last week of November 2020 and the payment will be made subject to a bank guarantee or indemnity bond from lenders, so that in case the Supreme Court invalidates JSW's resolution plan, the settlement amount will be reversed, said sources. A senior JSW Steel official declined to comment.

Lenders are yet to accept the proposal. JSW Steel's upfront payment to financial creditors was Rs 19,350 crore; with this additional Rs 400 crore, it would stand enhanced at Rs 19,750 crore; admitted claims of financial creditors is Rs 47,157.99 crore.

JSW's readiness to pay is a change from an earlier stance. In June, after the Covid-19 pandemic, it had sought flexibility in payment schedule for its bid, but lenders had rejected the demand. Between then and now, however, the fortunes of the steel industry have changed with prices touching a two-year high and spreads at a three-year high.

The closure of BPSL would add about three million tonnes capacity to JSW Steel's existing 18 million tonnes.

The additional outgo of Rs 400 crore would be distributed from the earnings before interest, taxes, depreciation and amortization (EBITDA) accrued to the company during the CIRP.

"There is a difference of opinion among lenders over the Rs 400 crore. Whether they will decide to accept it or wait for an outcome in the Supreme Court remains to be seen," a lender said.

The matter pertaining to distribution of EBITDA during CIPR is in the apex court. The National Company Law Tribunal (NCLT) while approving JSW's resolution plan in September 2019 had said that profits earned by running the corporate debtor during the CIRP are to be redistributed in accordance with the Essar Steel judgment of July 4, 2019.

Liberty Steel to start due diligence on Thyssenkrupp steel business

Liberty Steel, which last month announced a non-binding indicative offer for Thyssenkrupp Steel Europe, will soon start looking into its financial records, it said on Wednesday.

"Liberty Steel will shortly begin a detailed due diligence and thus gain insight into key business data of Thyssenkrupp's steel business," Liberty said in a statement.

Last week, sources told Reuters that Thyssenkrupp was likely to give Britain's Liberty Steel, headed by metals tycoon Sanjeev Gupta, access to the books of its steel unit.

Gupta's hand has been strengthened due to consolidation talks between Sweden's SSAB and Tata Steel that could result in a deal and potentially leave Liberty Steel as the sole bidder for Thyssenkrupp Steel Europe.

JSW Steel launches website to help MSMEs

JSW Steel has launched a dedicated website for MSMEs to help them purchase steel even in smaller quantities, a top official said on Tuesday.

MSMEs are usually smaller companies which produce various products for domestic and international markets. And facilitating with timely and affordable deliveries will enable them to compete much better, JSW Steel Director - Commercial Marketing and Corporate Strategy - JayantAcharya said.

With this aim, JSW Steel has launched (website) JSW For MSME. We are encouraging MSMEs to register so that we understand their requirements better. JSW Steel extends help to MSME with preferential pricing for its steel products, the dedicated sales team for MSMEs," he added.

Acharya further said micro, small and medium enterprises (MSMEs) account for 30 per cent of India's GDP. The target is to take this contribution to 50 per cent by 2024-25. In India, there are over 60 million MSME units and many of them are engineering exporters.

Investment Update

JSW Steel set to acquire land for 13 mn tonne steel plant in Odisha

Domestic steel major JSW Steelis in the process of acquiring land at Jagatsinghpur in Odisha where it has proposed to set up a 13.2 MTPA greenfield steel plant, a top company official said.

Speaking to PTI, JSW Steel Director - Commercial Marketing and Corporate Strategy Jayant Acharya said it is the same site near the port of Paradip where POSCO was keen to set up a 12 MTPA steel plant.

The Odisha government and POSCO had signed a Memorandum of Understanding (MoU) in this regard in 2005. However, the South Korean steel giant had to abandon its proposed Rs 52,000-crore project due to multiple reasons from delay in environmental clearances to protests by locals.

The pact ultimately expired in 2010 and was not renewed again.

"We have plans to expand through both acquisitions and brownfield expansions and then followed by greenfield (project) if we are looking in terms of Odisha," Acharya said.

The company plans to set up an integrated steel plant of 13.2 million tonnes per annum (MTPA) capacity in Odisha along with a 900 MW power plant for captive usage with an investment amount of Rs 53,700 crore.

Replying to a question on land acquisition for setting up the project, Acharya said, "We have already identified that (land) and the acquisition of that land is going on. Along with the Odisha government...we are doing...the land acquisition part."

It is the same land where POSCO was earlier looking to set a 12 MTPA steel plant, he said.

However, Acharya didn't provide a timeline for completion of land acquisition process.

The process is on and such processes take some time, he said.

"Whatever necessary allocations are coming to us which are ready for payment we would be doing that," Acharya added.

JSW Group had approached the Odisha government for land after POSCO shelved its plan to set up the steel plant. Subsequently, all statutory clearances given to POSCO were transferred to JSW Steel.

Last year in December, the hearing for the company's project was conducted.

"JSW's hearing was conducted peacefully and successfully. That is a huge development. The integrated project has been passed unopposed with almost the same investment that POSCO was looking for...We expect the work to start soon on the Rs 53,700 crore project," IPICOL Managing Director Nitin B Jawale had said.

The Industrial Promotion and Investment Corporation of Odisha (IPICOL) is the single point of contact for all industrial investments in the state.

Steel Market Update

Steel prices race past peak levels of 2018, spreads at 3-year high

Amid a sharp increase in iron ore prices, one of the significant raw materials for making steel, along with an improved domestic demand, Indian steel mills have hiked steel prices by around Rs 2000-2500 per tonne on 1st of December

As per industry sources, JSW Steel and JSPL have hiked prices by Rs 2,500 - Rs 2,700 per tonne and Arcelor Mittal Nippon Steel (AMNS) have raised prices

by around Rs 2,500 - Rs 2,750 per tonne effective from 1st of December.

Domestic steel firms have increased prices by upwards of Rs 2,500 a tonne effective December, taking it beyond peak levels of 2018. From December 1, prices have been increased by Rs 2,500-2,750 a tonne for flat steel.

The price for hot rolled coil (HRC) — a benchmark for flat steel — now stands at Rs 47,500-47,800. That's higher than the peak of HRC in November 2018. HRC price had scaled to Rs 46,250 a tonne for a brief period then and dropped from the early part of December.

Unabated hike in steel price has put MSMEs in a quandary

Steep hike in raw material prices along with the impact of Covid-19 has hit the MSMEs hard.While the onset of the festival season, supportive governmental announcements to aid growth and falling incidence of corona cases seemed as if things were moving in the right direction, spiralling and unjustified spurt in the price of steel and other allied materials started to hit the Micro, Small and Medium-scale enterprises (MSMEs) hard.

Industry insiders say that the price of steel, copper, zinc and brass has shot up 30-35 per cent between August and now, and is expected to move further north in the coming weeks.

“MSMEs will cease to exist if the steep hike in the price of materials is left unchecked. We are already facing huge cash crunch, are unable to execute the pending orders due to rising cost of inputs notwithstanding order cancellations and uncertainty. Securing fresh orders is another arduous task and most MSMEs do not have the wherewithal,” said Codissia President R Ramamurthy.

The association has drawn the attention of the powers that be for necessary corrective check on the steep increase in the price of raw materials.

“The industries here have been impacted very badly, considering that Coimbatore is home to manufacture of pumps, motors, compressors, wet grinders and various other products besides being engaged in supply of valves and auto components. The prices of steel and other allied foundry items like coke, pig iron, cast iron, steel scrap, CI Boring, HR and CR Sheet, copper and aluminum have increased by 30–35 per cent since April. Market sources have hinted about a further rise in the price of steel (from around Rs.47,000/- at present) to around Rs.60,000/tonne soon,” the Codissia president said.

The association has appealed to the government to allow import of metals and minerals to ease shortage and ensure smooth flow, fix an MRP for such raw materials and reopen the SAIL yard in Coimbatore.

The SAIL yard in Coimbatore was closed in 2015 as the construction of a railway over-bridge was taken up. This project was completed in 2017, but the SAIL yard has remained defunct.

This has forced the MSMEs to source their requirements from private operators and traders, making the rates uncompetitive in the market.

The association has requested the government to reintroduce the system of allocation of raw materials to MSMEs at subsidized price as was done earlier, via SAIL, VIZAG, NSIC, SIDCO and other Nodal State Government Distribution Systems.

Deeply concerned over steel price rise due to Covid-19: EEPC Indi

EEPCINDIA
ENGINEERING THE FUTURE

A recent sharp rise in steel prices has a "crippling impact" on the country's engineering exports which are facing the most challenging global markets in the face of another wave of Covid-19

A recent sharp rise in steel prices has a "crippling impact" on the country's engineering exports which are facing the most challenging global markets in the face of another wave of COVID-19 pandemic in several major economies, EEPC India has said.

India's engineering exports have declined by 14 per cent in April-October 2020-21 period, the Engineering Export Promotion Council of India (EEPC India) said on Wednesday.

"Engineering exporters are deeply concerned over rising steel prices. The prices have increased from Rs 35,000 per tonne to Rs 42,000 per tonne in the past six months for a product like hot rolled coil, an essential raw material for engineering industry," EEPC India chairman Mahesh Desai said in a statement.

He said prices of other essential metals have also been rising disproportionate to the end-product prices which can be realised in the international markets, becoming more and more tough.

The Zinc prices have shot up from Rs 170 per kg to Rs 220 per kg and freight charges have almost doubled.

"Engineering exporters face severe headwind and this is impacting their exports. Exporters also face scarcity of steel," Desai said.

Major markets of Europe are weathering a second wave of corona virus while the US is reeling from the deadly impact of the pandemic.

Desai appealed for Union Commerce and Industry Minister Piyush Goyal's intervention and impress upon the large steel manufacturers to keep prices in check.

"We urge the government to take up these issues to stabilise raw material prices as our member-exporters are facing deleterious impact", EEPC India said.

India's engineering exports have declined by 14 per cent from USD 44.43 billion during April-October 2019-20 to USD 38.14 billion in the same period of the current financial year as the global headwinds continue to blow severely.

Global price hikes strengthen steel manufacturers; sectoral m-cap up 43%

Steel manufacturers have become the top performers on bourses in recent weeks, with their combined market capitalisation (m-cap) rising 43 per cent in the last two months, vis-à-vis a 17 per cent rally in the Sensex. These include Tata Steel, JSW Steel, Jindal Steel & Power, and Steel Authority of India (SAIL).

The top 13 iron and steel firms now have a combined m-cap of Rs 2.45 trillion, up from Rs 1.7 trillion at the beginning of October. During the same period, the Sensex has rallied from around 38,000 to 44,600.

US steel market prices expected to continue climb: Platts survey

Sentiment was very firm in the US steel market heading into December, according to the monthly US steel sentiment survey by S&P Global Platts, with all participants expecting higher steel and raw material prices in coming weeks, and most expecting increased production and declining inventory levels.

In the survey of US producers, distributors, traders and end-customers, conducted in the run-up to December, the index for steel price development was at 86.8, indicating broad expectations of an increase (an index of 50 indicates stability).

The producer, trader, and end user sectors were all equally most bullish, with the price development index among the three groups at 87.5, while raw material suppliers, brokers, and distributors were slightly less bullish at 83.33.

"Low supply, demand very strong, no imports to backstop like 2018," one trader said. "Prices have to keep rising."

Participants expected steel production to see an uptick as well, with the index including all groups at 69.7. Notably, end users and mills were the most bullish at 87.5 and 75, respectively. The production change index for the trader group came in at 68.75, and 58.3 for raw material suppliers, brokers and distributors.

Once again, as in November's survey, the raw materials index was the most bullish indicator at 88.75, with mills, traders and end-user segment indices indicating 81.25, 94.4 and 87.5, respectively.

"Supply for metallic raw materials is becoming extremely tight and will reflect in pricing for December," a second trader said. "The question is end customer requirements and will export continue to strengthen?"

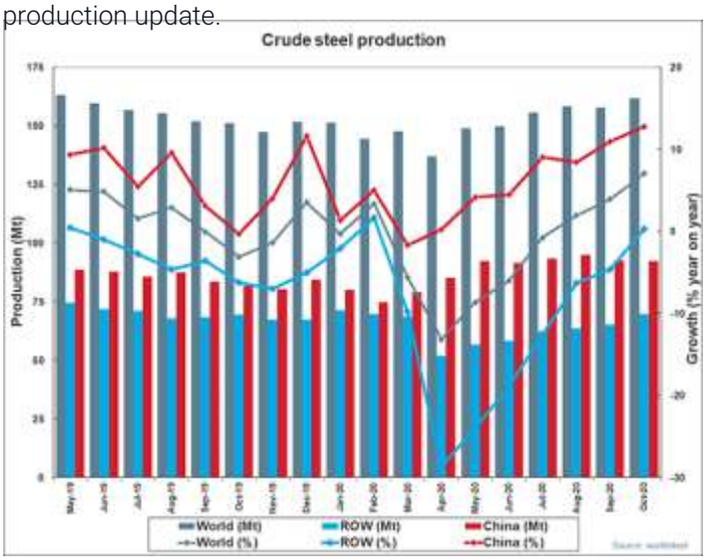
Another trader said he expected the strength in the scrap market to continue into January.

The index for inventory level development was bearish for December at 39.5, suggesting stock levels would decline, while the end user inventory development index was the most bearish at 25. The mills, suppliers, brokers, and distributors index was in the low 30's, while the traders' inventory expectation response level was 46.9.

"Low inventories [and] increasing demand will lead to shortages on longs and higher prices," a long product producer respondent said, adding the market could approach a point where it would once again be attractive for buyers to seek import options.

Crude steel production

World crude steel production for the 64 countries reporting to the World Steel Association (worldsteel) was 161.9 million tonnes (Mt) in October 2020, a 7.0% increase compared to October 2019. Due to the ongoing difficulties presented by the COVID-19 pandemic, many of this month's figures are estimates that may be revised with next month's production update.



In Asia, China produced 92.2 Mt of crude steel in October 2020, an increase of 12.7% compared to October 2019. India produced 9.1 Mt of crude steel in October 2020, up 0.9% on October 2019. Japan produced 7.2 Mt of crude steel in October 2020, down 11.7% on October 2019. South Korea's crude steel production for October 2020 was 5.9 Mt, down by 1.8% on October 2019.

In the European Union, Germany produced 3.4 Mt of crude steel in October 2020, up 3.1% on October 2019. Italy produced 2.1 Mt of crude steel in October 2020, down 4.6% on October 2019. Spain produced 1.1 Mt of crude steel in October 2020, down 7.7% on October 2019.

In North America, the United States produced 6.1 Mt of crude steel in October 2020, a decrease of 15.3% compared to October 2019.

In the C.I.S., production is estimated to be 8.4 Mt in October 2020, up 4.7% on October 2019. Ukraine produced 1.7 Mt of crude steel in October 2020, up 5.9% on October 2019.

In other Europe, Turkey's crude steel production for October 2020 was 3.2 Mt, up by 19.4% on October 2019.

In South America, Brazil produced 2.8 Mt of crude steel in October 2020, up 3.5% on October 2019.

Notes

The World Steel Association (worldsteel) is one of the largest and most dynamic industry associations in the world, with members in every major steel-producing country. worldsteel represents steel producers, national and regional steel industry associations, and steel research institutes. Members represent around 85% of global steel production.

For antitrust reasons worldsteel no longer produces a monthly global capacity utilisation ratio. Information on capacity can be found on the OECD website.

Monthly crude steel production in the 64 countries included in the report, in thousands of tonnes.

	October 2020	October 2019	% change Oct-20/19	10 months 2020	10 months 2019	% change
Austria	480 e	609	-21.2	5 198	6 341	-18.0
Belgium	550 e	705	-22.0	5 425	6 626	-18.1
Bulgaria	40 e	44	-9.3	403	481	-16.2
Croatia	0 e	2	-100.0	0	62	-100.0
Czech Republic	359	268	33.8	3 617	3 843	-5.9
Finland	362	316	14.8	2 826	3 030	-6.7
France	1 065	1 181	-9.9	9 292	12 424	-25.2
Germany	3 417	3 315	3.1	29 144	33 851	-13.9
Greece	135 e	122	10.7	1 167	1 141	2.3
Hungary	120 e	141	-14.6	1 307	1 442	-9.4
Italy	2 119	2 222	-4.6	16 669	19 801	-15.8
Luxembourg	180 e	178	0.9	1 596	1 844	-13.5
Netherlands	551	574	-4.0	4 959	5 591	-11.3
Poland	620 e	756	-18.0	6 468	7 670	-15.7
Slovenia	50 e	53	-6.1	469	538	-12.8
Spain	1 113	1 206	-7.7	8 933	11 803	-24.3
Sweden	414	330	25.4	3 578	4 036	-11.3
United Kingdom	565 e	610	-7.4	5 750	6 126	-6.1
Other E.U. (28) (e)	470 e	723	-35.0	5 216	7 750	-32.7
European Union (28)	**12 610**	**13 356**	**-5.6**	**112 017**	**134 400**	**-16.7**
Bosnia-Herzegovina	40 e	55	-27.3	425	662	-35.8
Macedonia	25 e	21	21.5	150	194	-22.6
Norway	65 e	63	3.7	527	528	-0.2
Serbia	124	160	-22.5	1 216	1 618	-24.9
Turkey	3 208	2 687	19.4	29 140	27 964	4.2
Other Europe	**3 462**	**2 985**	**16.0**	**31 459**	**30 967**	**1.6**
Byelorussia	230 e	232	-0.8	2 138	2 222	-3.8
Kazakhstan	340 e	351	-3.1	3 095	3 397	-8.9
Moldova	40 e	25	60.0	361	316	14.3
Russia	6 050 e	5 798	4.3	59 327	59 824	-0.8
Ukraine	1 653	1 561	5.9	16 977	17 963	-5.5
Uzbekistan	80 e	47	70.2	786	530	48.3
C.I.S. (6)	**8 393**	**8 015**	**4.7**	**82 684**	**84 252**	**-1.9**
Canada	850 e	1 030	-17.5	8 911	10 851	-17.9
Cuba	15 e	20	-24.1	138	185	-25.6
El Salvador	7 e	8	-17.5	62	84	-26.4
Guatemala	20 e	26	-23.1	184	253	-27.3
Mexico	1 470 e	1 454	1.1	13 713	15 600	-12.1
United States	6 143	7 250	-15.3	59 872	73 382	-18.4
North America	**8 505**	**9 788**	**-13.1**	**82 879**	**100 355**	**-17.4**
Argentina	382	382	0.1	2 872	3 961	-27.5
Brazil	2 784	2 690	3.5	25 131	27 450	-8.5
Chile	105 e	112	-6.2	950	912	4.2
Colombia	110 e	124	-11.0	927	1 150	-19.4
Ecuador	40 e	47	-14.0	376	506	-25.7
Paraguay	2 e	3	-38.4	15	20	-25.1
Peru	50 e	101	-50.7	437	1 037	-57.9
Uruguay	4 e	5	-25.7	36	50	-28.8
Venezuela	2 e	1	83.0	24	50	-51.4
South America	**3 479**	**3 466**	**0.4**	**30 767**	**35 136**	**-12.4**
Egypt	670	552	21.5	6 563	6 078	8.0
Libya	50	68	-26.7	351	478	-26.4
South Africa	380 e	546	-30.4	3 259	5 424	-39.9
Africa	**1 100**	**1 166**	**-5.6**	**10 173**	**11 980**	**-15.1**
Iran	2 660 e	2 080	27.9	23 794	21 129	12.6
Qatar	48	228	-79.0	1 052	2 198	-52.1
Saudi Arabia	748	532	40.6	6 164	6 886	-10.5
United Arab Emirates	192	285	-32.7	2 203	2 741	-19.6
Middle East	**3 648**	**3 124**	**16.8**	**33 214**	**32 954**	**0.8**
China	92 202	81 781	12.7	873 933	828 752	5.5
India	9 058	8 981	0.9	79 684	93 038	-14.4
Japan	7 200	8 150	-11.7	68 407	83 782	-18.4
South Korea	5 859	5 964	-1.8	55 039	59 628	-7.7
Pakistan	375 e	265	41.5	2 974	2 783	6.9
Taiwan, China	1 660 e	1 713	-3.1	17 325	18 611	-6.9
Thailand	390 e	361	7.9	3 539	3 556	-0.5
Vietnam	3 372	1 594	111.5	21 898	16 999	28.8
Asia	**120 116**	**108 809**	**10.4**	**1 122 798**	**1 107 148**	**1.4**
Australia	518	488	6.2	4 568	4 596	-0.6
New Zealand	59	51	15.3	484	551	-12.1
Oceania	**578**	**540**	**7.0**	**5 052**	**5 146**	**-1.8**
Total 64 countries (1)	**161 890**	**151 248**	**7.0**	**1 511 043**	**1 542 339**	**-2.0**

(1) - the 64 countries included in this table accounted for approximately 99% of total world crude steel production in 2019.
e - estimated

Society of Indian Automobile Manufacturers

Rajesh Menon, Director General, SIAM
rajesh.menon@siam.in

Auto Industry Sales Performance of October & April-October 2020

Monthly Performance: October 2020

Production: The total production of Passenger Vehicles*, Three Wheelers, Two Wheelers and Quadricycle in the month of October 2020 was 2,830,153 units, as against 2,086,479 units in October 2019 marking a growth of 35.64 %.

Domestic Sales:

- Passenger Vehicles* sales was 310,294 units in October 2020, compared to 271,737 units in October 2019, marking a growth of 14.19%.
- Three-wheeler sales was 26,187 units in October 2020 compared to 66,985 units in October 2019 marking a decrease by (-) 60.91%.
- Two-wheeler sales was 2,053,814 units in October 2020, compared to 1,757,180 units in October 2019, with a growth of 16.88%.

Performance: April - October 2020

Production: Total production of Passenger Vehicles**, Three Wheelers, Two Wheelers and Quadricycle in April-October 2020 was 10,840,307 units as against 16,098,141 units in April-October 2019 with a decline of (-) 32.66 %.

Domestic Sales:

- Passenger Vehicles** sales was 1,190,260 units in April-October 2020, compared to 1,605,041 units in April-October 2019, down by (-) 25.84%.
- Three-wheeler sales was 84,849 units in April-October 2020 compared to 397,681 units in April- October 2019, down by (-) 78.66 %.
- Two-wheeler sales was 8,037,492 units in April-October 2020, compared to 11,452,818 units in April-October 2019, down by (-) 29.82 %

** BMW, Mercedes, Tata Motors & Volvo Auto data is not available*

*** BMW, Mercedes & Volvo Auto data is not available, Tata Motors data is only available for Apr-Sep*

Commenting on the October 2020 data, Mr Rajesh Menon, Director General, SIAM said *"The month of October saw continuity in sales growth trajectory, drawing on from the previous month. There were marked improvements witnessed across certain segments due to very good festive demand. The sale of Passenger vehicles went up by 14.19% and that of two-wheelers, grew by 16.88%, compared to October last year. Three wheelers saw a slight improvement in sales, compared to the last month, however, it has still registered de-growth of (-)60.91 %, over the corresponding month of last year. October wholesale numbers have been good on account of dealers preparing to serve demand for the upcoming Diwali festival, which is in November this year."*

Category	Domestic Sales		
Segment/Subsegment	October		
	2019	2020	% Change
Passenger Vehicles (Pvs)*			
Passenger Cars	166,568	182,692	9.68
Utility Vehicles (UVs)	94,637	113,990	20.45
Vans	10,532	13,612	29.24
Total Passenger Vehicles (PVs)	**271,737**	**310,294**	**14.19**
Three Wheelers			
Passenger Carrier	56,067	16,458	-70.65
Goods Carrier	10,918	9,729	-10.89
Total Three Wheelers	**66,985**	**26,187**	**-60.91**
Two Wheelers			
Scooter/ Scooterettee	580,120	590,507	1.79
Motorcycle/Step-Throughs	1,116,886	1,382,749	23.80
Mopeds	60,174	80,268	33.39
Electric Two Wheelers	0	290	-
Total Two Wheelers	**1,757,180**	**2,053,814**	**16.88**
Quadricycle			
Quadricycle	87	0	-
Total	**87**	**0**	-

** BMW, Mercedes, Tata Motors & Volvo Auto data is not available*

Category	Domestic Sales		
Segment/Subsegment	April-October		
	2019-2020	2020-2021	% Change
Passenger Vehicles (Pvs)**			
Passenger Cars	981,782	689,059	-29.82
Utility Vehicles (UVs)	541,480	451,821	-16.56
Vans	81,779	49,380	-39.62
Total Passenger Vehicles (PVs)	**1,605,041**	**1,190,260**	**-25.84**
Three Wheelers			
Passenger Carrier	329,456	49,544	-84.96
Goods Carrier	68,225	35,305	-48.25
Total Three Wheelers	**397,681**	**84,849**	**-78.66**
Two Wheelers			
Scooter/ Scooterettee	3,697,478	2,276,855	-38.42
Motorcycle/Step-Throughs	7,362,882	5,428,210	-26.28
Mopeds	392,458	331,434	-15.55
Electric Two Wheelers	0	993	-
Total Two Wheelers	**11,452,818**	**8,037,492**	**-29.82**
Quadricycle			
Quadricycle	903	-27	-102.99
Total	**903**	**-27**	**-102.99**

*** BMW, Mercedes & Volvo Auto data is not available, Tata Motors data is only available for Apr-Sep*

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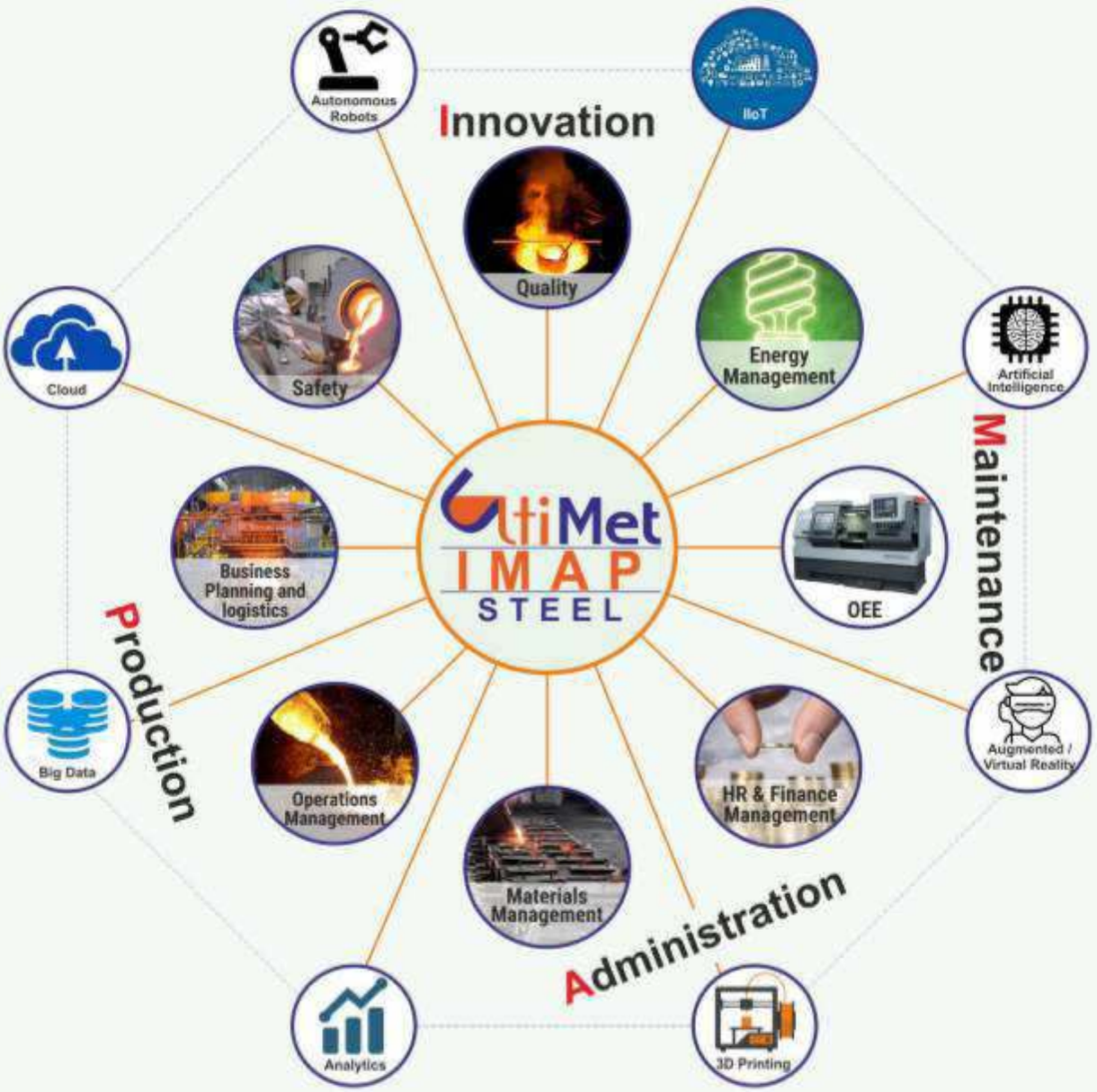

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Sustainable steel - Indicators 2020 and steel applications

The World Steel Association (worldsteel) today publishes Sustainable steel - Indicators 2020 and steel applications. The publication features the steel industry's sustainability performance via its 8 sustainability indicators and focuses on 3 key steel applications from a life cycle perspective: automotive, construction and packaging.

A life cycle assessment (LCA) of a product provides a full picture of its environmental performance as it accounts for resource and energy consumption as well as all emissions to air, water and land. LCA also considers all stages of a product's life, from the raw material extraction stage to its end-of-life stage, including reuse and recycling. An LCA approach must therefore be considered for the development of appropriate legislation to ensure that the true environmental impact of products is assessed correctly and consistently, avoiding any unintended consequences.

Construction, automotive and packaging are examples of three key steel market sectors where life cycle thinking is being incorporated into regulations or standards. A more widespread use of LCA in other applications is crucial to minimise the overall environmental impact of products throughout their whole life.

Nine steel companies were recognised by worldsteel as Steel Sustainability Champions for their work in 2019; Arcelor Mittal, BlueScope, China Steel Corporation, JSW Steel Limited, Nippon Steel Corporation, Tata Steel Europe, Tata Steel Limited, Tenaris and Ternium. Not only did they provide data for each of the indicators and for worldsteel's life cycle inventory (LCI) database, but also a programme or initiative of these companies was shortlisted for one of the 5 categories of the annual Steelie Awards, or Safety and Health recognition programme.

worldsteel uses 8 indicators to measure key aspects of the steel industry's economic, environmental and social sustainability performance. A total of 104 steel companies representing 1.1 billion tonnes of crude steel production contributed data – this covers nearly 60% of global crude steel production

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Worldsteel announces steel Challenge-15 World Championship Finalists

The Regional Championship took place online on 25 November 2020. This year's steel Challenge attracted over 1200 participants representing more than 50 companies and about 90 academic institutions from 27 countries. New this year, all participants successfully completing a simulation run receive a competition certificate.

There were over 10,700 attempts with the combined electric arc furnace steelmaking and secondary steelmaking simulation, with 6,119 successful runs completed.

The top-placed people in the 'Industry' and 'Student' categories will be invited to the World

Championship in April 2021. Also qualifying for the World Championship are the first-placed people in each of the five regions.

All Finalists will be awarded certificates and cash prizes. The World Champions in both categories will also be awarded a World Champion certificate, an additional cash prize and the steel Challenge trophy.

steel Challenge-15 utilised steel university's secondary steelmaking and continuous casting courses in a combined simulation. Competitors were tasked to produce a grade of steel meeting technical requirements at the lowest cost per tonne. The simulation used a grade of steel specifically designed for steel Challenge-15.

Competitors could undertake unlimited 'runs' of the simulation during the 24-hour competition period. A 'run' was concluded when the simulation had completed the set time, the result had been registered in the competition database, and the competitor had received a confirmation of successful completion.

The best 'run' of each competitor was to determine their score and placement in the Regional Championship.

New this year, all registered participants received access to the Secondary Steelmaking and Continuous Casting courses, including e-learning, 3D interactive models and simulators. Registered participants completing the Secondary Steelmaking course and the Continuous Casting course received completion certificates for each course. Also, participants successfully completing a simulation run during steel Challenge-15 will received a competition certificate.

The World Championship Finalists are:

Twefou!Dbufhpsz		
Qbsujdjqbou	**Bggjmjbujpo**	**Sfhjpo0Dpvousz**
Boesf!Nbttbddftj! Guimaraes	Vojwfstjuz!pgX ftun jotufs	Fvspqf!boe!Bqsjdb!0!Vojufe! Kingdom
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A

Tosyali orders EAF Quantum electric arc furnace, secondary metallurgy and continuous slab caster from Primetals Technologies

Turkish steel producer Tosyali Demir Celik Sanayi A.S. has placed an order with Primetals Technologies to supply an EAF Quantum electric arc furnace, a twin vacuum-degassing plant with oxygen blowing and a two-strand slab caster for a flat steel greenfield project in Iskenderun, Turkey.

The EAF Quantum is designed to handle metallic scrap and virgin materials such as HBI, pig iron in different composition and quality. The electrical energy requirement of the electric arc furnace is extremely low, mainly thanks to the scrap preheating system, but also due to many other features of EAF Quantum technology, such as FAST Tapping system, continuous foaming slag and continuous submerged electric arc (Flat bath operation). This reduces both the operating costs and the CO2 emissions.

The EAF Quantum is highly productive furnace that will reach lowest of possible power off times. The twin vacuum-degassing plant provides further treatment and steel quality to the production portfolio of Tosyali Demir Celik. With oxygen blowing possibility Tosyali Demir Celik steel plant will be ready to produce steel grades starting from ULC grades up to high carbon grades, peritectic grades, API grades, dual phase grades and also high strength low alloyed steel grades.

The plant will be equipped with TPQC (Through-Process Quality Control) and is thus ready of Industry 4.0. Two-strand continuous slab caster provides a capacity of two million metric tons of slabs per year, to be increased to 3.4 million tons, and is able to process a wide range of steel grades. The new melt shop is scheduled to be commissioned in by the end of 2022.

Potential impact of COVID-19 on steel industry trends

The COVID-19 outbreak has already given a significant boost to both technological progress and the green transition [1], which are the two main transformational forces of this century.

The accelerated speed of change is not likely to stop. Increased adoption of e-commerce and online services, online work and education tools will support the development of new enhanced technological tools and services, creating a self-reinforcing cycle for technological progress.

Concerning the green transition, the COVID shock-induced increase in awareness of the looming environmental risks will almost certainly lead to increased public pressure on governments and businesses for an acceleration in mitigation of risks. It will increasingly be required of them to take the necessary adaptation measures to protect people (preparedness).

We already see some countries announcing "green recovery packages" that place supporting renewable energy development and decarbonisation technology development at the centre of their plans for economic recovery from the pandemic.

Let's now consider the resulting industry-specific consequences of an accelerated green transition and a technologically progressive environment for the global steel industry.

Dr BarisBekirÇiftçi
Head, Strategic Initiatives and Raw Materials Markets, Worldsteel

1. Increased focus on decarbonisation

Our efforts towards decarbonisation are likely to receive a boost from the COVID-19 pandemic.

Investments in energy efficiency, electrification and higher scrap use, and efforts towards the development of breakthrough low CO2 emission steelmaking technology are likely to be accelerated.

2. Accelerating product portfolio evolution

Our product portfolio has always evolved in response to changing requirements of steel-using industries.

However, the pandemic most likely accelerated some of the changes we expected to see in our customers' requirements.

So, we will need to accelerate our efforts in providing steel solutions for zero-emission mobility, smart & green buildings, solutions for climate change adaptation projects and infrastructure modernisation.

3. Increased focus on the life cycle and circular economy characteristics of steel

The pandemic is likely to underpin the global steel industry's efforts towards studying the life cycle and circular economy characteristics of its products, towards improving these characteristics and communicating the superior attributes of its products very strongly.

4. Increased focus on collaboration: sustainability partnerships

The massive scale of the climate change challenge will require increased collaboration with the following partners:

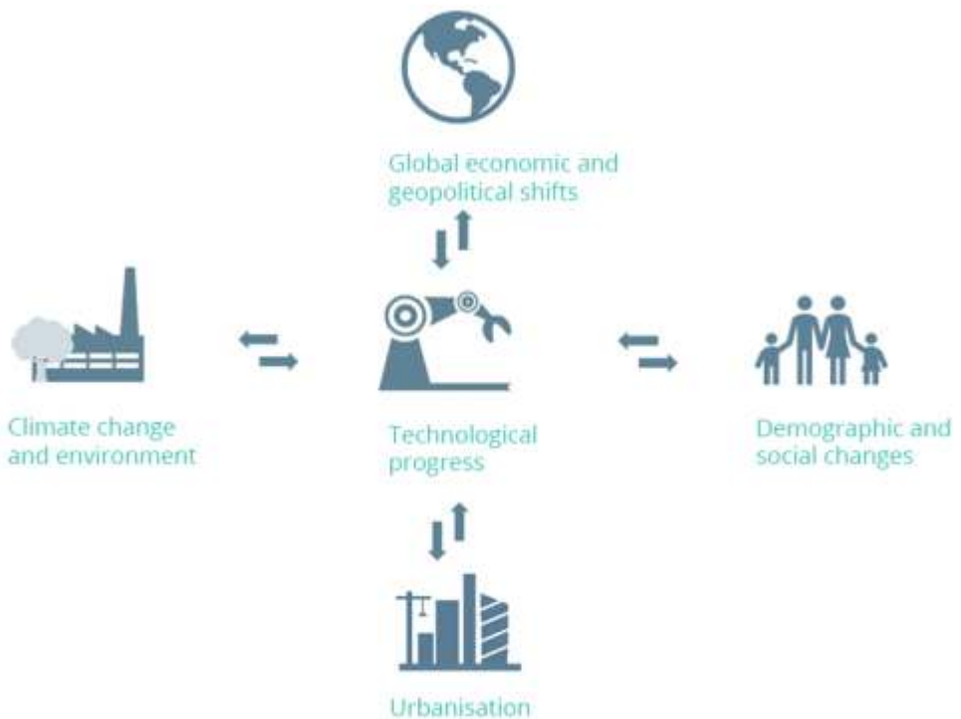
· energy and chemical companies:
for decarbonisation in carbon capture and use projects and hydrogen steelmaking, and the use of steel co-products and recycled gases.

· steel-using industries:
in the design phase for the development of the appropriate steel solutions for smart and green applications.

· our supply chain:
for meeting ESG standards and transparency, better management of steelmaking materials involving sorting and beneficiation processes that will result in a smaller environmental footprint.

Below Diagram adapted from Blackrock, 2019, "Megatrends: the forces shaping our future"

It has been observe that increasing environmental consciousness and pressures are driving a reformation of the global socioeconomic order. This has been most evident in the energy and automotive industries so far. This process is also known as the green transition.



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