AIIFA SUSTAINABLE STEEL MANUFACTURERS ASSOCIATION
(FORMERLY KNOWN AS ALL INDIA INDUCTION FURNACES ASSOCIATION)
Voice of Indian Sustainable Steel Manufacturers

AIIFA News

VOL. No. XXIV
ISSUE No. 6, June, 2024

What's Inside

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- Sintering Pre Heater
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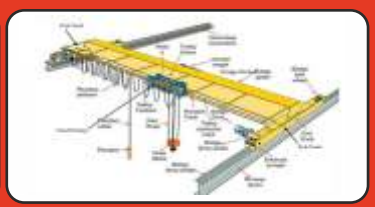
Electromagnet

- Scrap Lifting Circular Electromagnets
- Billet and Bars Lifting Rectangular Electromagnets
- Scrap Lifting Elliptical Electromagnets


Cable Reeling Drum

- Cable Reeling Drum
- Lining Vibrators
- Electrical Control Panel

EOT Crane

- Single Girder EOT Crane
- Double Girder EOT Crane


Spare Parts & Accessories

- Spare Parts & Accessories of EOT Cranes
- Spare Parts & Accessories For Induction Furnace

Manufacturer & Exporters of EOT Cranes, Scrap Lifting Circular Electromagnets, Billets & Bar Lifting Rectangular Electromagnets, Induction Furnace Electric Sintering Heater, Ladle Electric Pre-Heater, TundishElectric Pre-Heater & All Components and Accessories related to EOT Cranes, Electromagnet & Steel Industries.

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Induction Furnace Steel Making is Solution for Sustainable Eco-friendly Steel

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Introduction: The steel industry plays a significant vital role in global economic development of civilizations since 3000 BC. Steel's strength, durability, flexibility and ability to be endlessly recycled make it a critical component of sustainable product, equipments and infrastructure. Steel production is responsible for environmental impacts, including greenhouse gas emissions, resource depletion, and waste generation.

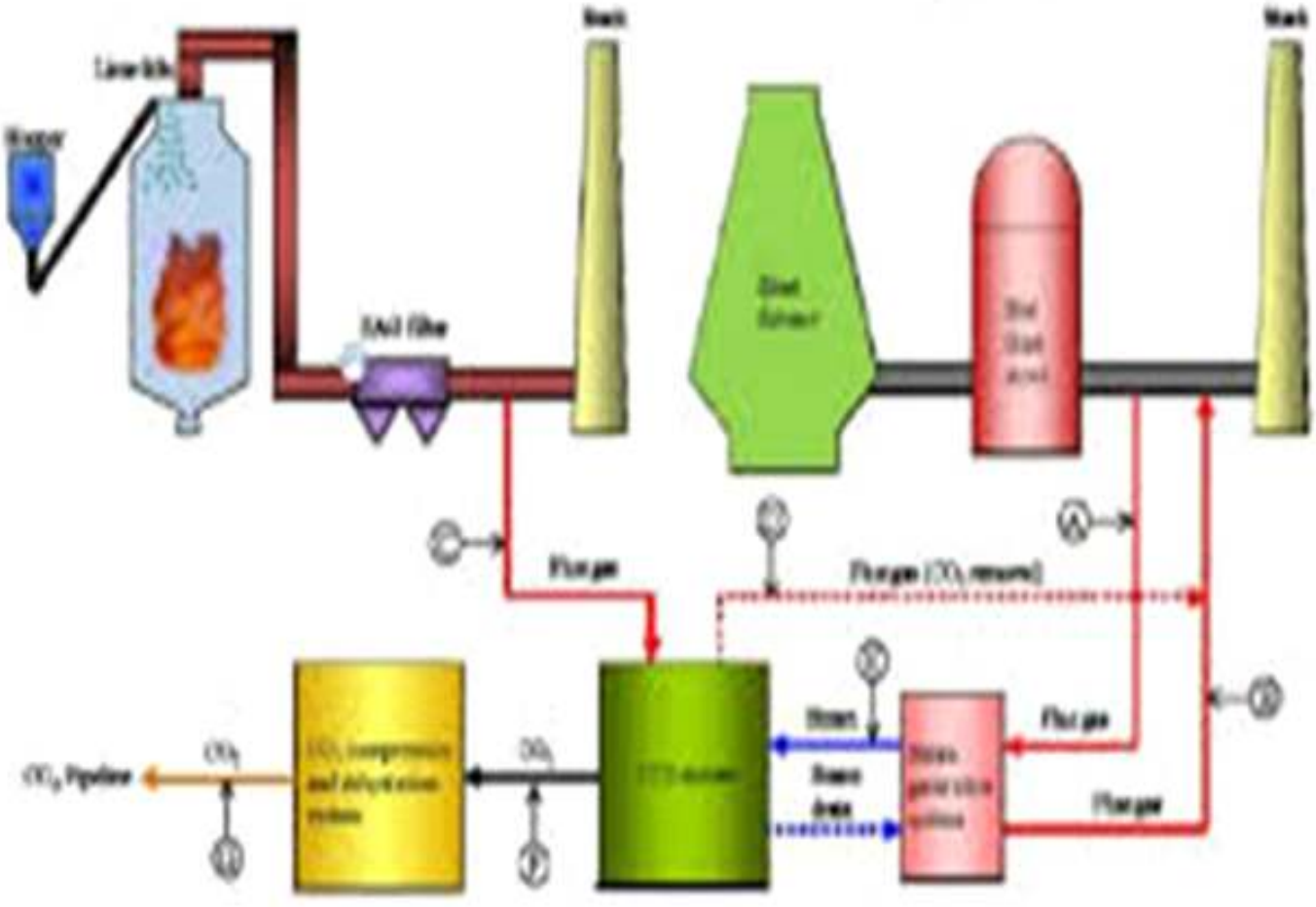
As the world strives for sustainability of steel products, the green steelmaking has emerged as a pathway to mitigate these challenges and promote a more environmentally friendly steel production process. Green steel making encompasses a range of practices and technologies aimed at reducing the industry's carbon footprint and minimizing its environmental impact.

One key aspect of green steel making is the integration of renewable energy sources into the production process. By shifting away from fossil fuel led steel making process and adopting clean energy alternatives can significantly reduce their carbon emissions and dependence on finite resources. Another crucial element of green steelmaking is the recycling and reuse of materials as steel is highly recyclable, and by utilizing recycled scrap steel as a primary feedstock, the

industry can reduce the need for virgin raw materials, conserving resource.

As second highest steel producing country next to China, Challenge before Indian steel industry is to combat climate change producing green steel. However, the pathway towards green steel production depends on many variables from steel demand to energy supply and raw material availability.GHG emissions are often measured in carbon dioxide (CO2) equivalent. To convert emissions of a gas into CO2 equivalent, its emissions are multiplied by the gas's Global Warming Potential (GWP).. Carbon dioxide (CO2) emissions from human activities are now higher than at any point in our history.of Industrial Revolution which was underway. Most countries have seen their carbon emissions balloon over time as their populations and economies have grown.

Steel is one of the most commonly used materials in the world. With more than two million tonnes of this iron and steel manufactured every year, it is one of the main materials required to manufacture automobiles of all types, buildings and infra-structure activities , usable goods everyday like equipments, tools and tackles and what not. Where more than six million people are directly employed in its manufacture. Worldwide steel industry is responsible for about 8 % of the CO2 emissions caused by mankind . For this reason urgent action is needed to initiate a decarburization process which also has the potential to be a massive economic opportunity.



Processing of Carbon Capture & Storage from Steel Industry

Carbon Capture, Sorage & Utilization : Leading Steel producing industries allover the World are committed to creating a more sustainable industry and are working continuously on various projects to minimize GHG emission level. Several countries have started separation process of CO2 rich gas fron iron & steel industries, compressing the same, pumping at a long distance and injecting into oil field for permanent storage of carbon capture However, deployment is still not sufficient in many countries to reach the anticipated net-zero CO_2 emissions target by 2050. Ccaptured carbon can be stored in geologic formation or be put to productive use in the manufacture of fuel, building materials, enhanced oil recovery and more.

Carbon rich steel making process gases are rich in carbon monoxide, hydrogen and carbon dioxide which are, known as steel mill gases (SMG), having good energy value and are therefore currently being used in power generation within the steel plant to contribute for power needs of steel making. However, with currently available technologies, these gases can be used to produce value added products like ethanol, methanol and urea, The availability of clean hydrogen can significantly increase the production of value-added chemical. Implementation of CCS CCUS (carbon capture and carbon captutue urtlization).CCUS can potentially reduce the emissions by ar least 45%. Level.

In the coal fired power industry or in steel industries, coke used in Blast Furnce for iron making is burnt to produce coke in coke oven plant, the important raw material in steel industry.

The CO2 can b separated from Hydrogen and separated CO2 transported through pipeline and H2 burns in furnace. releasing energy for heat or power either from powr plant or steel industry.

Carbon capture and utilization process refers to a range of applications through which CO2 is captured and used either directly or indirectly as various products. CO2 today is primarily used in the fertilizer industry and for enhanced oil recovery. It is important to remember that steel industry, as a whole, is one of the most polluting and energy-hungry industries on the planet. Steel is manufactured mainly by two processes as primary route i.e. by use of fossil fuel as heat energy and the other one is electrical steel making process like EAF and EIF where electricity is the only heating source.

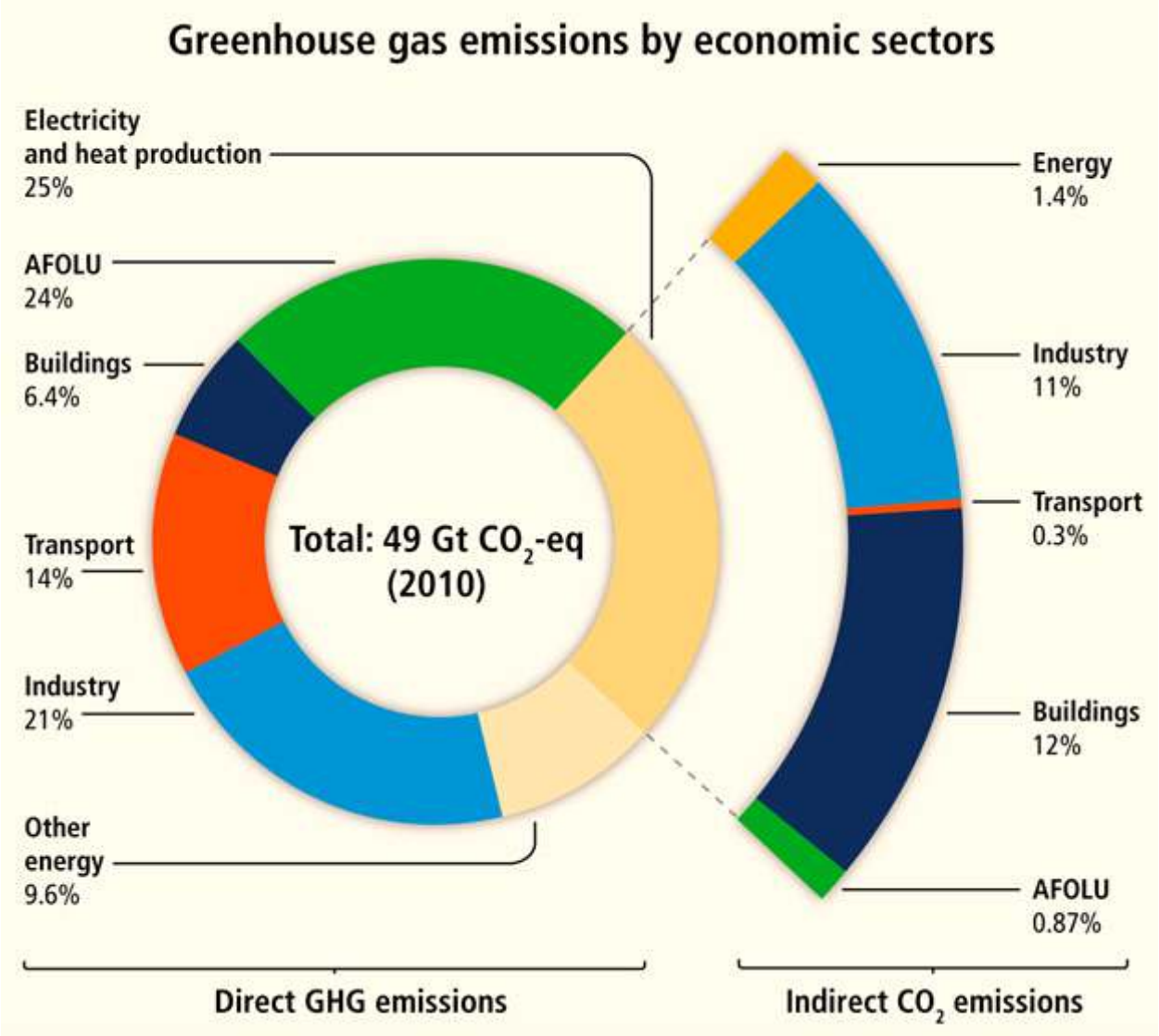
GHG – Contributes Emission : At the global scale, the key greenhouse gases emitted by human activities are:

Carbon dioxide (CO_2) -: Fossil fuel use is the primary source of CO_2, which. can also be emitted from the landscape through deforestation, land clearance for agriculture or development, and degradation of soils. Likewise, land management can also remove additional CO_2 from the atmosphere through reforestation, improvement of soil health, and other activities.

Methane (CH_4) - Agricultural activities, waste management, energy production and use,, biomass burning contribute to CH_4 emissions.

Nitrous oxide (N_2O) - Agricultural activities, such as fertilizer use, are the primary source of N_2O emissions. Chemical production and fossil fuel combustion also generates N_2O.

Fluorinated gases (F-gases) - Industrial processes, refrigeration, and the use of a variety of consumer products contribute to emissions of F-gases, which include hydro-fluorocarbons (HFCs), per-fluoro carbons (PFCs), and sulfur hexafluoride (SF_6). Additional compounds in the atmosphere including solid and liquid aerosol and other greenhouse gases, such as water vapor and ground-level ozone can also impact the climate.



Reference : Guide to Carbon Cpture, Storage and Utilization- Professor Paul Fennel-

Contribution of CO2 in GHG: Global carbon dioxide emissions from fossil fuels and industry totaled 37.15 billion metric tons (CO_2) in 2022. Emissions are projected to have risen 1.1 percent in 2023 to reach a record high of 37.55 CO_2. Human activities are responsible for the increase in greenhouse gases in the atmosphere over the last 150 years. In fact, global CO2 emissions were 182 times higher in 2022 than they were in 1850. Increased volume of CO2 emission has caused Global warming.. If the current trend of total emissions continues, the Earth's temperature will rise by 3.2 degrees by the end of this century, leading to destructive consequences for the planet.

The steelmaking industry is responsible for 7 to 9% of global carbon emissions. Therefore, to preserve the planet, reducing CO2 emissions is crucial as one of their major sources.The largest source of greenhouse gas emissions from human activities in the United States is from burning fossil fuels for electricity, heat, and transportation. Since 1990, emissions grew almost 38%. On a sector basis, electricity generation increased 25% but emissions grew 35%, due to an increased proportion of fossil fuel-generated electricity in the latter 1990s.Emissions are still rising in many parts of the world. However, several countries have managed to cut their emissions in recent decades.

With affordable low-carbon technologies, other countries can increase their living standards without the high-carbon pathway that rich countries followed in the past.

Sustainable Steel Production: The sustainability of steel production involves

1. Evaluation of recycled input raw materials,,,
2. Activities of the production processes and
3. the output products conversion from inputs by use of electrical energy

Research on sustainable high-temperature metallurgical steel making process from induction furnace emphasizes the importance of optimization of use of energy and resource efficiency in liquid metal processing to finished products from recycled scrap optimizing the recovery of high value fealloys like Fe-Cr, Fe-Ni/ Ni., Fe-Mo, Fe-V and others., process quality control,. Additionally, emergy analysis reveals that steel production heavily relies on non-renewable energy sources, with varying environmental impacts across different processes, such as ingot teeming, continuous casting, forging or rolling, heat treatment of finished products.

Top GHG Emitting Countries in the World -

1. **China** is the largest emitter of carbon dioxide gas in the world, with about 11,336 million metric tons in 2021 where primary heating source is burning og fossil fuel most notably coal most notably from coal.burning About 58% of the total energy generated by China in 2021 came from coal alone, and because coal is rich in carbon, burning cause CO2, burning in power sector and industrial plants, boiler etc emit GHG.
2. **The U.S.** is the second-largest emitter of CO_2, with 5,032 million metric tons of total carbon dioxide emissions in 2021which came from transportation, power generation units, and industry in 2021.. Even though the U.S. government undertook significant efforts to reduce the reliance on coal for electricity generation, the country remains a major producer of crude oil.
3. **India** is the third-largest CO_2 emitter, with 2,674 million metric tons of total carbon dioxide emissions produced in 2021 when coal is the main energy source and is supplying about 44% of the energy in the country. Petroleum and other liquids provided about 24%.Natural gas accounts for only 6% of India's energy consumption. However, the country plans to increase the natural gas market share to 15% by 2030 to reduce air pollution and use cleaner-burning fuels.
4. **Russia** is the fourth-largest contributor to CO_2 emissions in the world, emitting 1,712 million metric tons in 2021. Russia has one of the largest natural gas deposits in the world, and natural gas is the primary source of energy and power generation in the country. Coal, which is widely used in chemical and other basic material industries and for power generation in Russia contributing Russia's CO_2 emissions. Russia has also been a large supplier of natural gas to other countries, primarily in Europe.
5. **Japan** is the fifth-largest producer of CO_2 emissions, with 1,602 million metric tons in 2021. Japan's energy fuel mix changed after the 2011 fter accident at Fukushima. Oil is the largest source of energy in Japan, with its total share of energy consumption being 38% in 2021, which is the latest figure available. Coal still makes up a large share of energy consumption in Japan: 25%.

Nuclear power plant generation is becoming more prominent in Japan after the nuclear disaster and now accounts for 23% of energy consumption as of 2021. The country's energy plan from 2018 has the goal of increasing nuclear-fired power production by 2030 to reduce the dependency on hydrocarbon fuel imports

Top Steel Producing Countries & Production Route:

	Yearwise Major Steel Producing Countries					Route wise Prodn %	
Country	2023	2022	2021	2020	2019	Primary●	Secondary●●
China	1010.1	1018.8	1032.8	1064.0	995.4	90	10
India	140.2	125.4	118.2	100.3	111.4	44	56§
Japan	87.7	89.2	96.3	83.2	99.4	76	24
USA	88.7	80.5	85.8	72.7	87.8	30	70
Russia	75.8	71.7	75.6	71.6	71.7	64	36
World	1888.2	1887.6	1951.9	1877.5	1874..4	72	28

● Fossil Fuel Route, ●● Electrical Route

§ About 60% f steel produced from only Induction Furnace from Combined Route of EAF and EIF

Use of Recycled Scrap Results Low level of CO_2 Emission: Scrap is the mostly used raw materials for the EIF and EAF charge. It classification depends on the grades of steel manufactured and the sorts of charge scrap available commercially in the market. The following properties should be entailed for the sake of the scrap material classifications. Consideration of following properties like alloy content, harmful element & scrap shape in furnace charge likely to bring correct steel quality and productivity in melt shop. Secondary steel making routes use 105% scrap steel, with almost nil emission.

Recycling steel has been practiced primarily for economic reasons due to its inherent magnetism, making it easy to separate from other non-magnetic materials. Moreover, steel doesn't undergo significant chemical property changes during recycling, enabling endless recycling possibilities. The real economic value of recycling steel lies in substantial cost savings in melt process with nil emission.

Ferrous products (i.e., iron and steel) can be recycled by both internal and external methods. Some internal recycling methods are obvious. Metal cuttings or imperfect products are recycled by remelting, recasting, and redrawing entirely within the steel mill. Ferrous products (i.e., iron and steel) can be recycled by both internal and external methods. Some internal recycling methods are obvious. Metal cuttings or imperfect products are recycled by remelting, recasting, and redrawing entirely within the steel mill.

Recycling Ferrous Scrap Policy : :Ministry of Steel, Govt. of India has issued the Steel Scrap Recycling Policy. which aims to achieve the following objectives .

1. To promote circular economy in the steel sector.
2. To promote a formal and scientific way of collection, dismantling and processing, sorting activities for end of life iron & steel products, other metal products, which will

lead to resource conservation, energy savings and setting up of an environmentally sound management system for handling ferrous scrap..

3. Processing and recycling in an organized, safe and environment friendly manner.
4. To evolve a responsive ecosystem by involving all stakeholders.,
5. To produce high quality ferrous scrap for making quality steel production thus minimizing the dependency on imports.·
6. To decongest the Indian cities from ELVs and reuse of ferrous scrap,
7. To create a mechanism for treating waste streams and residues produced from dismantling and shredding facilities in compliance to Hazardous & Other Wastes Management & Trans-boundary Movement- Rules, 2016 issued by MoEF & CC.·
8. To promote 6Rs principles of Reduce, Reuse, Recycle, Recover, Redesign and Remanufacture through scientific handling, processing and disposal of all types of recyclable scraps including non-ferrous scraps, through authorized centers / facility.

Steps Followed by Scrap Recyclers for Raw material Supply to EIF / EAF :

Metal scrap comes from different sources such as: Mill scrap i.e. return scrap (from primary processing), Used construction beams, rods, plates, pipes, tubes, wiring, and shot, Old automobiles and other automotive scraps.(after end of life), Boat/ ship demolition scrap, railroad scrap, and rail car scrap, Miscellaneous scrap metal. Ferrous metals are magnetic and are often collected in scrap yards by a large electromagnet attached to crane, sweeping across piles of scrap to grab magnetic objects.

The entire activity in Recycling is a multi-step process, starting with collection and transport of raw scrap, pretreatment, melting in induction furnace , refining, forming in forge shop or rolling mill and finishing. The recycling processes fall into these basic categories as loading and unloading, breaking and separating, Gas torch cutting, Non-gas torch cutting and other cutting., Baling, compacting, and shredding, Melting and baking in furnaces and ovens., Applying chemical processes to recycle metals.

Aside from the strength and durability of ferrous metals, they are also well-known for their recyclability. Generally, ferrous scrap is generated from 3 sources viz..

1. **Home scrap** – It is internally generated in the steel production process when arising happen in the total process of steel chain as well as in ,anufacture new finished steel products. This form of scrap rarely leaves the steel-making production area.and is returned to the furnace on site for melting at level of approximately 30-40% even more and melted again. Technological advancements have significantly reduced home scrap to about 29%.
2. **New Scrap, and Old Scrap**.- All steel equipment, steel components, steel structucture even tiny components, and other iron & steel products can be recycled and reprocessed again into new ferrous metal for using as raw material for steel melting which are recycled since ferrous metals do not lose any of their defining properties during the whole recycling process. As a matter of fact, there are ferrous metals that can be recycled numerous times.

The recycling of ferrous metals is typically conducted by recycling centers and scrap yards. The whole process of ferrous metal recycling begins with the sorting and separation of ferrous and non-ferrous metals or any other contaminants.

Since numerous types of ferrous metals are magnetic, then a powerful magnetic device would be essential for separation which are sorted and collected utilised to collect them. A shredder that has magnetic drums can also be used to collect all ferrous metals.

Once all ferrous metals are collected, they will then be sheared to size as needed for charge making. Consequently, the purified ferrous metals will be compacted to transform into solid blocks or beams shearing and balling.Ferrous metals can also be subjected to recasting and redrawing processes, which would totally depend on the recycling centre. But no matter what the recycling process is, recycling ferrous metals is undoubtedly one great way of helping the environment preserve metal materials, reduce energy consumption, and eliminate the emission of toxic elements.

1. Material Sorting. As it is magnetic, iron and steel can be quickly separated from other recyclable metals within a metal recycling facility using powerful magnetic belts.
2. Shredding. Media separation. .
3. Shearing. & Sorting

Baling and supply tto melt shop..It may be seen that recycling increases from 2018 to 2022 and carbon emission reduction index decreased and dropped from 11.8% level of 2017 to 8.7% in 2022.Similarly, the carbon emission reduction index for electricity melting route decreased by about 10% a year. Accurately assessing carbon emissions from recycling scrap steel is essential for reducing emissions in the steel industry.

In fact, **recycling already covers 26 % of global demand** and work is underway to increase that percentage. In Spain, more than 85% of steel is recycled, which puts the country in eighth place in the continent. The Netherlands ranks first with 97.3 %, while others such as Italy are still below 75 %.

Economic Value of Recycling:

Ferrous scrap ng helps boost the broader economy by creating more productive and cost-effective industries. Some vital economic advantages include job creation and expansion of different markets.Recycling means less waste goes to landfills and incinerators. You can thus lower waste management costs for collection, transportation, and disposal. Energy savings. Using recycled materials offers a reduction in energy costs when compared with producing goods from virgin materials.

The act of recycling has become more than just a trendy concept. Now,it has become a social responsibility that every citizen has a duty to practice. The economics of recycling are many. Some may side step recycling because it is not convenient or the fact that they do not see the benefits. Recycling is not just good for the environment, but it can also be an incredibly useful economic tool. Recycling can help country to save money, and it can also create jobs when materials are salvaged for reuse. **Recycled scrap can help EIF in achieving productivity, clean, green steel optimizing cost.**

Decarburizing steel - The greenhouse gas effect is a process that occurs when gases in Earth's atmosphere trap the Sun's heat. This process makes Earth much warmer than it would be without an atmosphere. Greenhouse gases (GHG) have far-ranging environmental and health effects, air pollution causing climate change contributing to respiratory disease from smog and. extreme weather, food supply disruptions, increased wildfires which are other effects of climate change caused by greenhouse. (GHG) distinguishes them from other gases that they absorb the wavelengths of radiation that a planet emits, resulting in the greenhouse effect occurring in a planet's atmosphere, insulate the planet from losing heat to space raising its surface temperature.

Surface heating can happen from an internal heat source as in the case of Jupiter, or from its host star as in the case of the Earth. Carbon dioxide is Earth's most important greenhouse gas that absorbs and radiates heat. Unlike oxygen or nitrogen (which make up most of our atmosphere), greenhouse gases absorb heat radiating from the Earth's surface and re-release it in all directions—including back toward Earth's surface.

Technology of Fossil Fuel Free for Steel Making: Fossil free means that product or service created without using fossil fuels or fossil raw materials like coal. Fossil-free steel is produced without creating carbon emissions and by using fossil-free energy sources. For thousands of years, steel has been made using coal to remove oxygen from iron ore, emitting vast amounts of CO_2 in the process.

The driving factors for such exponential growth is the growing carbon footprints from steel industry where use of HDR technology segment registered a significant market share. Which is well suited. climatic. Global key players operating in the global Green Steel market are Tata Steel, Arcelor Mittal, Salzgitter, Thyssenkrupp, SAIL, Green Steel, Deutsche Edelstahlwerke Services, Jindal Steel and Power, United States Steel Corp, Tenaris Hydnum Steel and many others..

HDR technology is known as hydrogen direct ***reduction*** (***HDR***) which is the most prominent among green steel ***technologies***.. Hydrogen-based direct reduction uses hydrogen instead of coal as a reagent to reduce iron ore to pig iron, eliminating the CO2 emissions from the equivalent process in a traditional blast furnace for iron making

But now, SSAB is set to revolutionize the industry with HYBRIT® technology, using hydrogen instead of coal in the ore reduction process, and emitting water instead of CO_2.SSAB Fossil-free steel is based on iron-ore produced without fossil fuels, using HYBRIT® technology. Independent of the raw material,, steel produced will have the lowest emission steel offering. SSAB Zero™.. This is Used as an alternative to coking coal for ironmaking (via a process such as Hybrit, or, more likely, Directly Reduced Iron technology from companies such as Midrex and Tenova). Used in combination with the hydrogen technologies above as a downstream processing step and including melting of scrap steel for recycling

Electric Route Steel Making – The Other way of Green Steel : With the expansion of ectrification, powering with renewable energy can effectively eliminate all emissions from EAF and EIF steelmaking process. However, rapid growth in the renewable power sector required to supply the power to help EIF & EAF to produce for clean and green steel. As this route needs l vast amounts of electrical energy.

Scrap is a strategic raw material for achieving carbon neutrality goals by the global steel industry. Steelmakers around the world are now making plans or already implementing projects to increase EIF/EAF utilization, so global scrap consumption will increase. It is expected that while the ratio between steelmaking in oxygen converters and electric arc/ induction furnaces is now 70/30 which may liely to change by 2030. More than 300 million tons of scrap per year will be needed to provide additional production at EIF/EAF technology during the transition to environmentally friendly green steel.

The global Green Steel market valued at USD 1400.40 Million in 2022 and is expected to grow a CAGR of 28.6% during the forecast period (2023-2030). likely to be customized furtheras per the requirement or any other market segment for their business need.suiting to market requirements. The global Green Steel market was valued at USD 1400.40 Million in 2022 and is expected to grow a

CAGR of 28.6% during the forecast period (2023-2030).

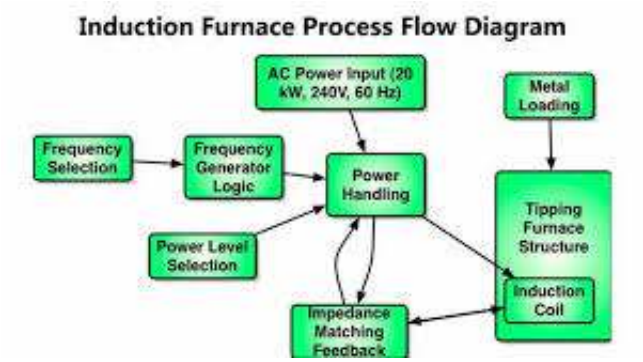
Nowadays customers like OEMs, component and other manufacturing units choose the most suitable environmentally friendly green steel products for their path to a sustainable products for their sustainable future. Manufacturing units responsible for supply of forged drive shaft, crash management components and other critical parts either from forged or rolled and machined condition for automobile industries are looking for imported products.

Through optimized material properties for specific applications, material efficiency increases directly or indirectly leading to weight reduction and emission savings during vehicle operation as Green Steel provides the highest strength for components subjected to high loads. The good formability and weldability also enable efficient manufacturing processes.

Alloy & special steels should be tailored to suit specific OEM requirements of quantity like defect free surface, internal soundness dimension, range of properties like tensile and yield strength, hardness, ductility, corrosion resistance, heat resistance, impact resistance etc.These customizations ensure components, parts meet varied industry needs

Induction Furnace Steel Making has become choice of Steel Producers, Customers and User industries the manufacture of steel products for the following reasons

1. It has no electrode and electric arcs which allow the productions of steel & alloys low in carbon and occluded gases without any quality problem,.**2**. Low melting losses (almost Nil.), **3**. Better recovery of costly alloying elements, **4**.Refractory cost is much less compared to Arc furnace,..**5**.High power efficiency, therefore, cost-effective6, **6**.Precise control of the operating parameters and easier operation, **7**.Because of smallness of furnace, it is easier to produce alloy & special steel even highly critical grades which satisfy user industries..,



Induction Furnace Operational Flow Diagram

Status of China' Steel from Electrical Route:

Compared to long-process steelmaking, electric arc furnace short-process steelmaking for alloy & special steel consumes electricity as energy, significantly reducing CO_2 emissions as Induction furnace steel making was totally stopped for sub-standard quality. The “Guiding Opinions on Promoting the High-Quality Development of the Steel Industry” states that it encourages eligible enterprises to prioritize the transformation of electric arc furnace steelmaking only. China also is gradually establishing small- and medium-sized electric arc furnace steelmaking enterprises in central cities and urban clusters taking lessons,fron India's drive for and it can synergistically dispose of urban waste; and encourages regions with advantageous conditions to establish electric arc furnace steelmaking demonstration zones and explore and develop new technologies and equipment.

Three-quarters of the upcoming global steel capacity is in Asia, with 58-60 % from China and India, according to 2023 Global Energy Monitor report. In terms of the BF-BOF route, 99 per cent of the new developments are in Asia, with China and India holding the majority of these developments (79 per cent). However, looking at the share of

upcoming BF-BOF capacity, India holds a share of 44 per cent, against China's 90% production. Both top steel-producing countries have also seen some positive developments in terms of deploying EAF China has already set a goal of increasing its EAF-based steel production with 100% secondary refining state for improving steel quality.

India's steel sector accounts for about 12% of India's carbon dioxide (CO2) emissions, with an emission intensity of 2.55 tonne of CO2/tonne of crude steel (tCO2/tcs) compared with the global average emission intensity of 1.85 tCO2/tcs. Indian steel industry contributes to around 2% of the Gross Domestic Product (GDP) and is critical to the country's progress. In the fiscal year (FY) 2023, the production of finished steel in India was 122.3 million tonnes,1 an increase of about 7.6% over the previous year.2 India's steel sector accounts for about 12% of India's carbon dioxide (CO2) emissions, with an emission intensity of 2.55 tonne of CO2/tonne of crude steel (CO2/tcs) compared with the global average emission intensity of 1.85 tCO2/tcs.3 The steel industry is responsible for around 240 million tonnes of CO2 emissions annually and we expect this to double at an exponential rate by 2030, considering the Indian government's infrastructure development targets.

As the capital investment of electiic induction furnace is less compared with the EAF/ BOF steelmaking route, an induction furnace-based steel plant can be installed with relatively lower investment for smaller capacity plants, giving rise to the concept of integrated mini steel plants, which are a comparatively new trend of making steel Induction furnaces use electromagnetic fields to heat and melt scrap metal, leading to faster and more energy-efficient steel production.

Environmental Benefits from Induction Furnace Steel Making: Induction furnace steel making with recycled ferrous scrap saves substantial energy to the tune of about 25-30%. This reduces carbon emissions and a lower environmental footprint even reducing resource depletion. :Use of recycled stel in induction n furnace reduces amount of waste in landfills., Contaminants such as paints, coatings, and other materials on steel products can complicate recycling and may require energy-intensive cleaning processes.

Conclusion : :Steel is a challenging sector to decarbonizes. However, evolving green steel goals are altering the supply landscape and steelmakers are under pressure from stakeholders to reduce their reliance on conventional (highly polluting) blast furnace route and adopt low-emission alternatives.. The Induction furnace steel making route can produce steel of any steel grade in alloy with a higher recovery rate of costly ferro-alloys with with nilf greenhouse gas emissions compared to other steel making process accommodating 100% recycled scrap..

Green Steel opens new markets and competitive advantages for particularly sustainable-minded customers. Extensive investments in infrastructure for providing affordable renewable electricity are necessary for scaling. Green Steel is already being used in many industries such as construction, infrastructure, automotive, machinery, and medical technology. The term "Green Steel" refers to climate-neutral or low CO2 emissions steel produced using innovative technologies and processes to minimize the environmental impact of steel production. Unlike conventional steel production, which is highly energy-intensive and emits considerable amounts .

Future prospects & innovations as forward thinking solution. Induction furnace steelmaking is

more in line with environmental protection requirements, while electric arc furnace steelmaking produces a large amount of exhaust gas, waste residue and noise. Further Dust generation is the major concern for all steel furnaces which is lowest from EIF compared to EAF,f dust, resulting in a high cost for dust removal. Dust collection is still necessary with coreless induction furnaces, however, at an approximately 85% lower rate. Along with a lower capital investment, reduced emissions inside and outside of the mills and friendliness to shaky power grids, the use.

In the future, **hydrogen-based reduction** will play an increasing role: instead of coke as Green Steel opens new markets and competitive advantages for particularly sustainable-minded customers. Extensive investments in infrastructure for providing affordable renewable electricity are necessary for scaling. Green Steel is already being used in many industries such as construction, infrastructure, automotive, machinery, and medical technology.

Future prospects & innovations as forward thinking solution, pure hydrogen reduces the iron ore, enabling almost emission-free steel production. Leader in this field, Swiss Steel Group relies 100% on electric route steel production and recycled ferrous scrap as raw material for steel production.

Steel produced from Induction Furnace by Indian mini steel plants is gradually taking a leading position in almost every industry activities. Steel production and consumption are frequently used as measures of a country's economic development because they are both a raw material and an intermediary product. Because of the foundation of country' economy, Induction furnace steel would not be an exaggeration to say that it has always been at the forefront of industrial progress mainly in construction , infra-structure activities,, automobile industry. Etc.

India's indutry leaders post-independence saw steel and power as the cornerstones of the country's future growth when attention given for tonnage and category wise volume production but now everywhere challenge is to produce clean and green steel climate mitigation committing quality products commitments. Efforts for future de-carbonization can benefit from understanding its progress to date.

Steel is used to build the majority of India's modern infrastructure, which confirmed their vision solidifing the sector's vital role in the growth of the country. India is currently on track to overtake Japan as the world's second-largest consumer of steel.

References:

1. **All India Induction Furnace Association,News Letter, ND**
2. **Govt. of India – Ferrous Scrap Recycling Policy**
3. **WSA Report on Global Steel Producing Country,**
4. **Global Scenario of GHG Emission,**
5. **Professor Paul Fennel – CCS & CCSUwith Flow Diagram**
6. **CISA Report on China's Performance, New TechnolgyHDR/ HYBRIT,**
7. **Progress of Switzerland - The long-term climate strategy can reduce its greenhouse gas emissions by 2050 to around 90 per cent of the 1990 level. The remaining emissions must be balanced with negative emissions technologies**

Date: 07/07/2024

GOLDMAN SACHS' EXPECTATIONS FOR FY25

Fiscal Deficit Target could be Kept at 5.1%

New Delhi: India will likely peg its FY25 fiscal deficit target at 5.1% of GDP in the upcoming budget, which could make an overarching statement about long-term economic policy towards 2047 with an emphasis on job creation through labour-intensive manufacturing, credit for MSMEs and continued focus on services exports by expanding GCCs, according to Goldman Sachs. “We expect the government to stick to the announced fiscal deficit target of 5.1% of GDP for FY25 (or even slightly lower) and announce further consolidation to a deficit of below 4.5% of GDP by FY26,” Goldman Sachs said in a note Monday.

Finance minister Nirmala Sitharaman will present the budget for FY25 on July 23. In her interim budget she had pegged fiscal deficit 5.1% of GDP.

“We see an emphasis on job creation through labour-intensive manufacturing, credit for micro, amall and medium enterprises, continued focus on services exports by expanding global capability centres, and a thrust on domestic food supply chain,: the not said.

Goldman said its advice to investors would be to look beyond fiscal numbers in this budget. “The government will use the budget…to make a big picture statement about long term economic policy vision over several years, rather than minor stimulus announcements” it said.

Source: The Economic Times

Date: 07/07/2024

FOCUS ON VISION 2047

Niti Meet on July 27 to Talk Viksit Bharat

First meeting under Modi government 3.0

New Delhi: The NITI Aayog is likely to hold its governing council meeting, the first after the formation of new government at the centre, on July 27 to deliberate on the government's Vision 2047 for a Viksit Bharat.

The meeting, to be chaired by Prime Minister Narendra Modi is expected to be attended by chief ministers of all states and lieutenant governors of union territories, besides the top ministers of the union cabinet.

The governing council is the apex body of NITI Aayog, which replaced the erstwhile Planning Commission and will be meeting for the ninth time.

The Aayog has been pursuing the policy of cooperative federalism and has regularly called upon all states to deliberate on important matters pertaining to the economic growth of the country as It feels India's growth is closely linked with that of the states.

Prior to this, finance minister Nirmala Sitharaman is expected to lay out the blueprint for a Viksit Bharat while presenting the full Union Budget on July 23. NITI Aayog, in consultation with all ministries and departments, has been working on the Vision Documents that envisions India to be a developed economy of $30 trillion by 2047, the 100th year of its Independence.

In 2023, the Aayog was entrusted with the task of consolidating ten sectoral thematic visions into a combined vision for Viksit Bharat I 2047. The vision encompasses various aspects of development, including economic growth, social progress, environmental sustainability good governance, among others.

The ten sectoral group of secretaries formed for the purpose included rural and agriculture, infrastructure, resources, social vision, welfare, finance and economy, commerce and industry, technology governance, security and foreign affairs.

Source: The Economic Times

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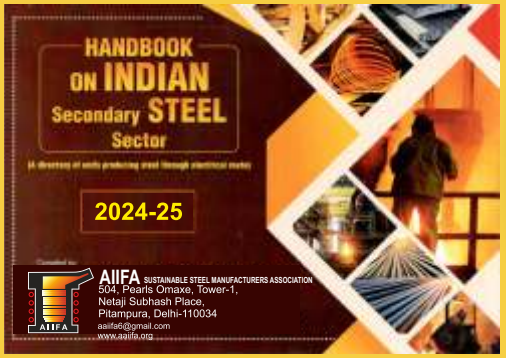

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