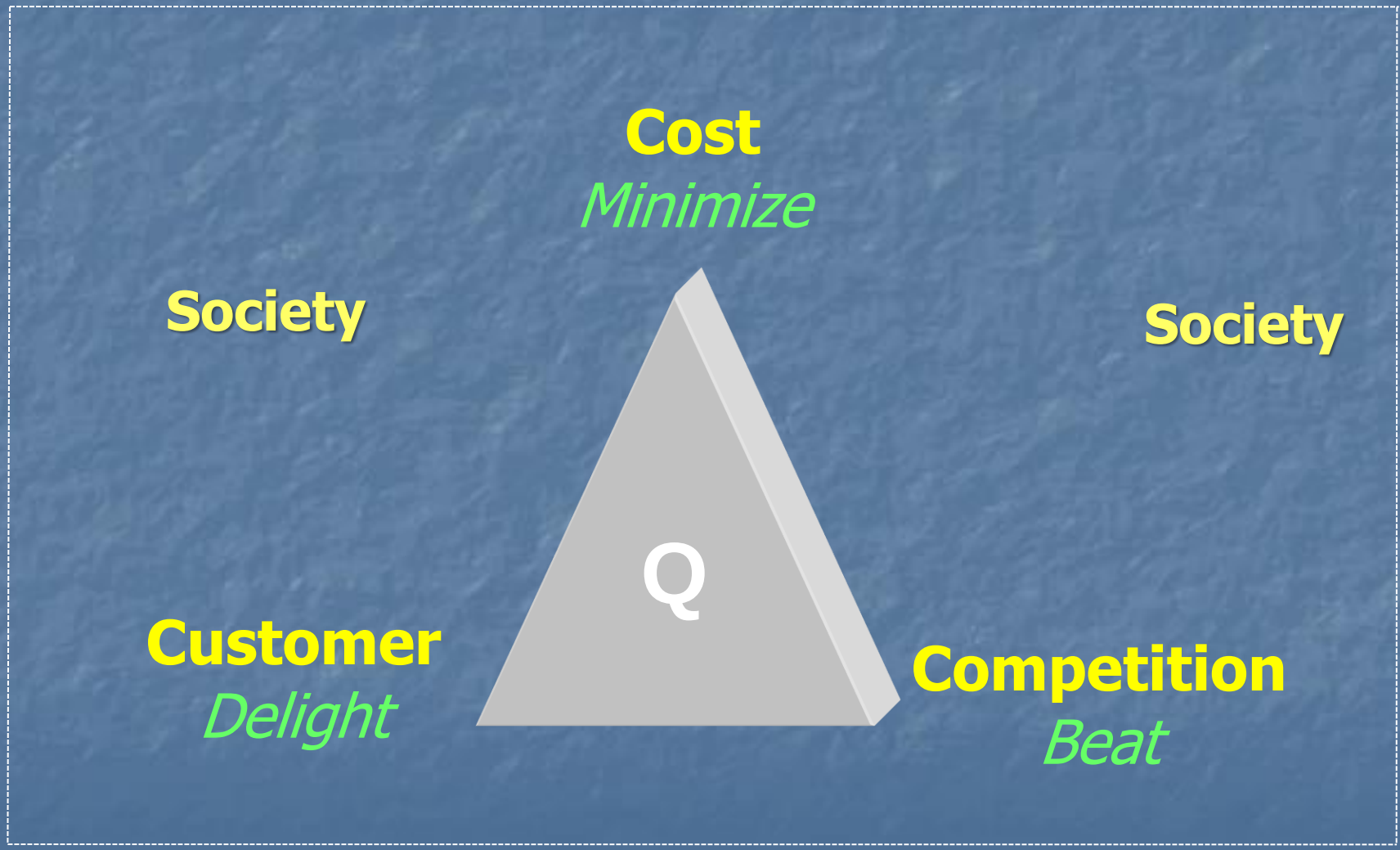
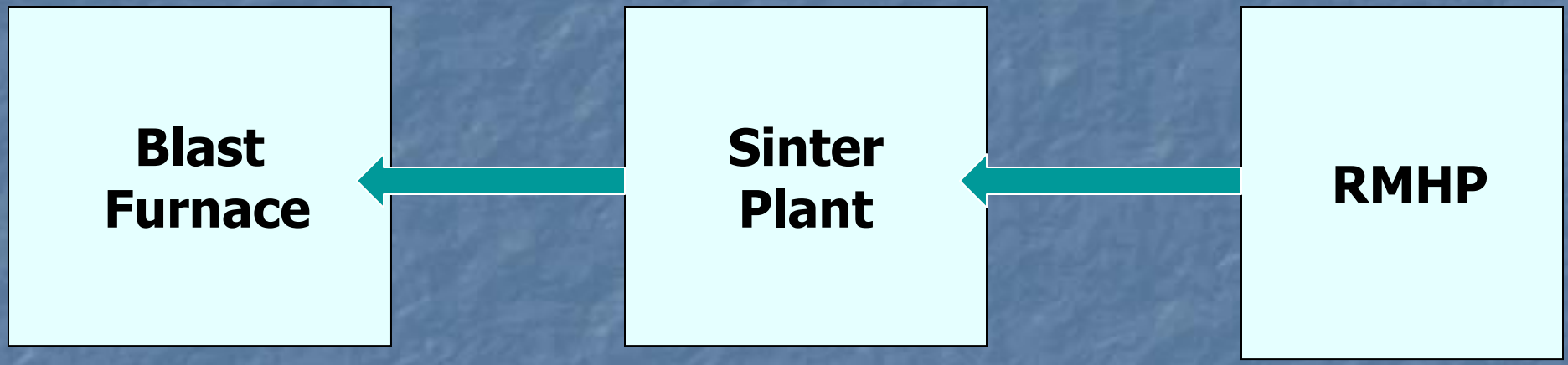
Durgapur Steel Plant
SINTER PLANT

24th June 2025, Tuesday, L&D,14.00 Hrs

Challenges Ahead



Functions of SINTER PLANT



To supply sinter to blast furnace of required

** Quantity*

** Quality*

Flow Process Chart Of Sinter Plant

Design Parameters	SP-1	SP-2
Year of commissioning	1968	1995
No. of Strands	Two	One
Capacity (MT)	1.3	1.71
Revised Capacity (MT)	1.5	1.8
Production T/Day	5000	5184
Productivity ($T/M^2/Hr$)	0.8	1.2
Area of the Machine (M^2)	142.7	180
Designed By	British	Russian

RMHP
BED
Sinter Mix
061 & 062

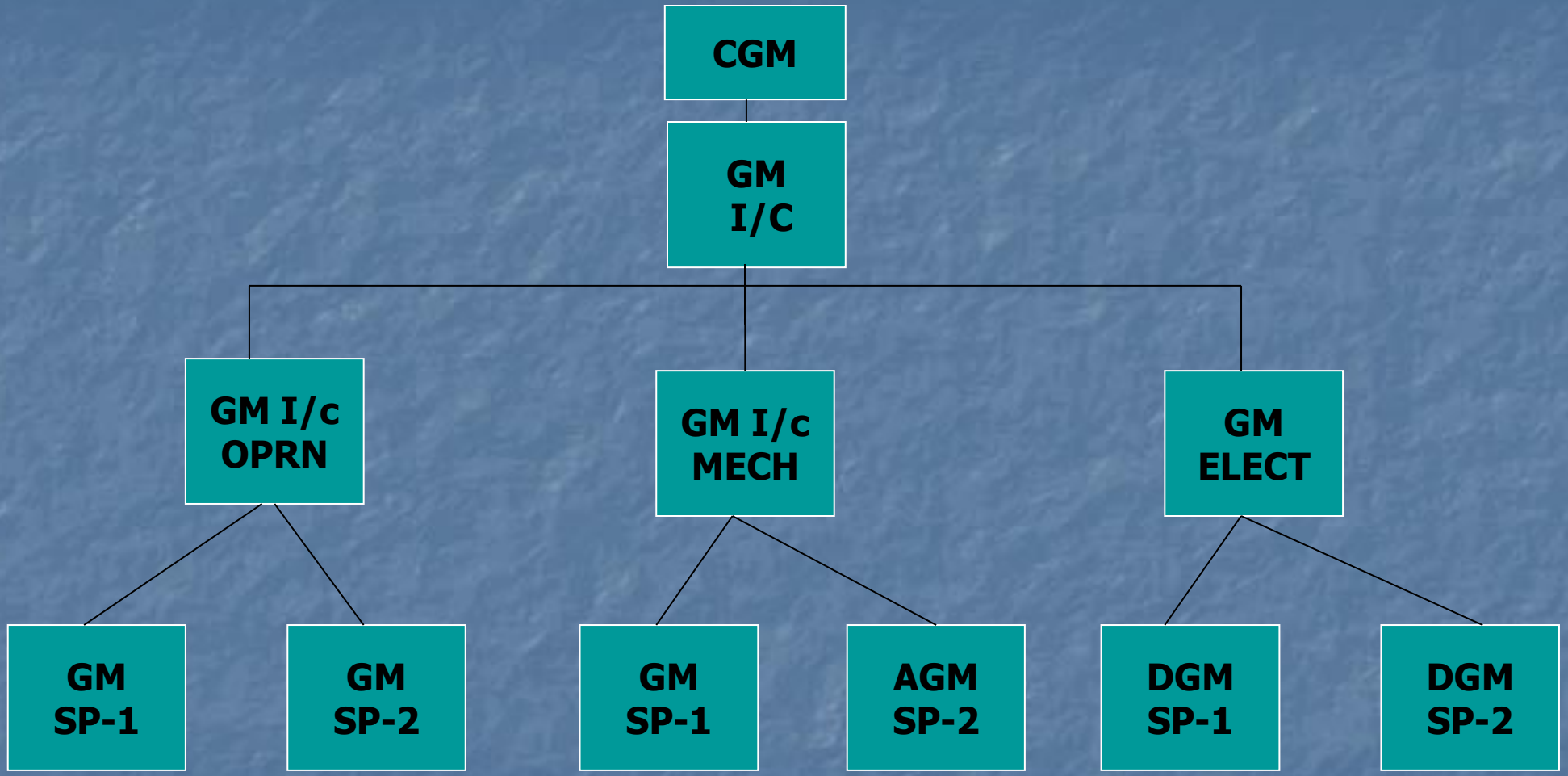
→

Sinter Plant
SP1
SP2

→

Blast Furnace
BF2
BF3
BF4

Organizational Structure



Manpower

Section	Executives	Non-Executives
Operation	12	70
Mechanical	9	78
Electrical	8	54
DSO	1	*
CGM,HOD	2	*

Contract Workers : 150

Production Plan 25-26

Plant	APP
Sinter Plant-1	1712
Sinter Plant-2	1948
SHOP	3660

Production Summary 24-25 Up to Feb'25

Plant	APP	Actual	% Fulfilment
Sinter Plant-1	1512	1553	103
Sinter Plant-2	1760	1769	100
SHOP	3270	3323	101

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DSP LAUNCHES

INDIA'S FIRST INDUSTRIAL-SCALE BAMBOO BIOCHAR TRIAL TO CUT CO_2 EMISSIONS

DSP on February 27, 2025 initiated India's first large-scale industrial trial using bamboo biochar in sinter production to reduce fossil fuel consumption and CO_2 emissions. The trial at Sinter Plant No. 2 aims to partially replace coke breeze (a fossil fuel) with bamboo biochar, marking a significant step towards green steel production.

Following extensive laboratory and pilot-scale testing at SAIL's R&D Centre in Ranchi, the industrial-scale trial was conducted in two phases. The use of bamboo biochar could replace 10-20% of coke breeze, leading to an estimated 15-20% reduction in CO_2 emissions per ton of crude steel produced. Being a part of the biospheric carbon cycle, biochar has the potential to be carbon neutral, provided it is sustainably produced.

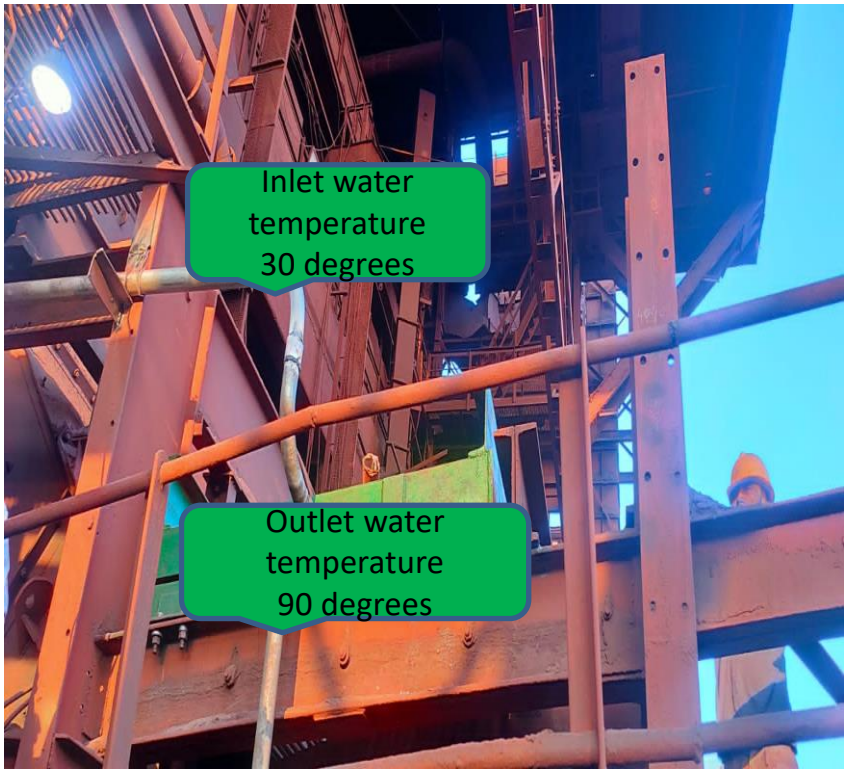
This initiative is aligned with India's decarbonization goals and SAIL's commitment to reducing carbon emissions. It also demonstrates SAIL's active engagement in sustainable steelmaking and its role in exploring alternative fuels to lessen reliance on fossil-based resources. If successful, this trial could set a new industry benchmark for eco-friendly steel production.

The inauguration of this trial was attended by senior officials from DSP, ASP, ISP, RDCIS, and the Ministry of Steel, along with union representatives and employees of the sinter plant.

Bamboo Biochar as alternate fuel to coke breeze

- Biochar produced from biomass has comparable properties to coke.
- Biochar is **carbon neutral fuel**, sustainable alternative for decarbonizing the steel industry
- "Within the biospheric carbon cycle, bioenergy can be carbon neutral because the carbon that is released during combustion has previously been sequestered from the atmosphere and will be sequestered again as the plants regrow, i.e. If sustainably produced"
  (**International Energy Agency**)
- India is the second-largest producer of bamboo in the world, having total bamboo-bearing area of 15 mill. Hectares
- The Government of India launched a restructured National Bamboo Mission (NBM) in 2018 with the objective of increasing the area under bamboo plantations
- The prevailing NBM policy framework provides opportunity for the steel industry
  - To explore the feasibility of bamboo as a raw material to substitute coal and coke
  - The viability of bamboo in the steel sector can address the short-term goals of net zero emissions committed by the Government of India.

Heat Exchanger for Hot Water Addition in SMD 136 Of SP1 Strand 1



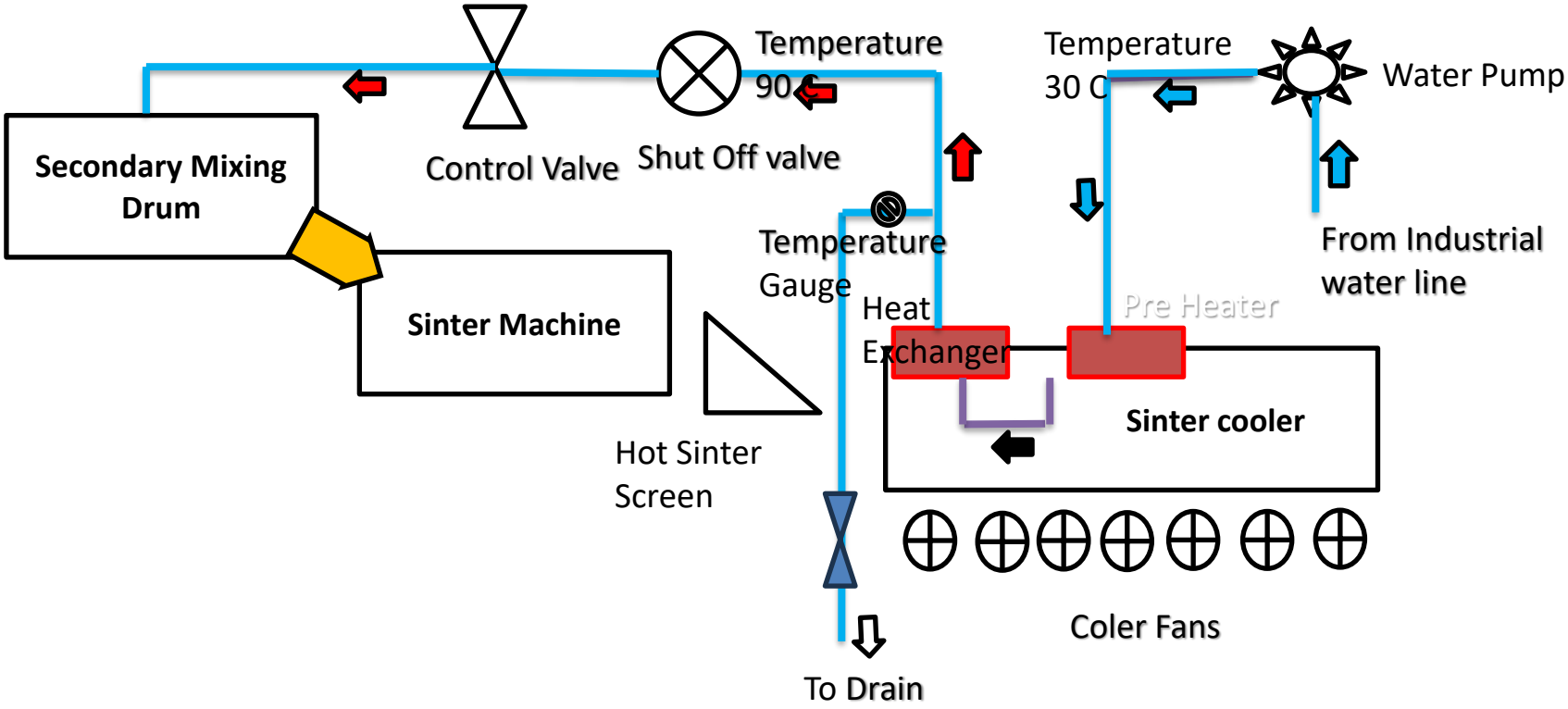
Commissioned In January 2024

Brief Description Of Hot Water Addition Project In SP1

Sinter Plant -1

- Two strands of sinter machine of area 142.7m2 each.
- For Mixing and Nodulising of green mix water is added in SMD 136.
- After sintering on sinter machine the sinter is cooled on sinter cooler from 500^0 C to below 100^0 C by air.
- With this waste heat recovery from sinter cooler bed water is heated through heat exchanger and added in SMD 136.

Scheme of Hot Water Addition Project In SP1



Benefits of Hot water addition in sintering process

1. The Productivity improvements and energy savings associated with hot water addition translates into reduction in solid fuel consumption.

2. The addition of hot water enhances the sintering process, leading to a higher-quality sinter product with improved physical and metallurgical properties.

Techno-Economic Benefits

Strand#1 of SP1 coke consumption is reduced by 1.5 kg/TGS.

Avg Monthly production of ST#1 79,000 T. (April-Nov'24)

Cost of coke breeze is Rs 22000/T.

Total saving on account of reduction in coke breeze is

(22000*1.5*79000)/1000 = Rs 26 Lakh/Month

Reduction in Coke breeze consumption will indirectly help in reduction in "Carbon Foot Print" (1 ton of Coke consumed = 3 Ton of CO_2)

CHEMISTRY OF SINTER

Fe	56 % min
FeO	8 – 11%
SiO_2	4.8 – 5.20%
Al_2O_3	2.0 – 3.0%
CaO	9 – 10%
MgO	2.5 – 2.8%

PHYSICAL PROPERTIES OF SINTER

+ 60 mm	3.5% max
- 5 mm	8% max
Mean size	16 – 20 mm
Reducibility Index (RI)	65% min
Reduction Degradation Index (RDI)	30% max

Highlights

Coke Oven Gas Injection Trial on Sinter Bed of SP#2

Under the decarburization initiative, Durgapur Steel Plant in collaboration with SAIL/RDCIS, successfully designed and implemented the system to **inject coke oven gas directly onto the sinter bed at Sinter Plant-2.** The system is envisaged to achieve a **reduction of approximately 3.5 kg of coke breeze per ton of gross sinter (TGS)**, translating to a net carbon dioxide **reduction of around 11 kg of CO_2/TGS.**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