Bi-lateral cooperation between Japanese and Indian steel sector in technology transfer

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Energy Saving Activities of Japanese Steel Industry

Eco Process

Efficiency improvement of production process

Eco Product

Contribution from use of highgrade steel in finished products

Eco Solution

Global contribution from the use of energy conservation technologies and equipment

Activities to develop innovative technologies

Technology for separating and capturing CO2 in blast furnace gas Iron ore reduction technology using hydrogen in reformed coke oven gas

Eco Solution - Three pillars of the energy management in the steel plant

3



Three pillars will encourage self-improvement of energy consumption of the steel plant

The public and private collaborative meeting between Indian and Japanese iron and steel industry (1/2)

Purpose

To encourage technology transfer from Japanese to Indian steel industry and thereby contribute to the energy saving in India and in the world.

Members – Public and Private sectors of India and Japan

India

Public members and

observers

Ministry of Steel Bureau of Energy Efficiency etc. **Private members and**

observers

Indian steel companies (SAIL, RINL, Tata, JSW, Bhushan, BPSL, Essar, Jindal etc.)

Japan

Public members and observers

Ministry of Economy, Trade and Industry/ NEDO / JBIC / JETRO

Private members and observers

The Japan Iron and Steel Federation (Nippon Steel & Sumitomo Metal, JFE steel, Kobe steel, Nisshin Steel etc.)

Public and Private

Partnership

The public and private collaborative meeting between Indian and Japanese iron and steel industry (2/2)





Activities related to three pillars of energy management

ISO14404



Steel Plant Diagnosis using ISO14404 (2013 and 2014)



TECHNOLOGIES CUSTOMIZED LIST

In the second se

Technologies Customized List Ver.2 (2014)



Business Seminar with regards to the technologies on TCL (2014)

Energy Management







Technologies Customized List

List of energy saving technologies appropriate for the Indian steel industry



Point 1. Reflect technological knowledge of steel experts Point 2. Reflect Experience of Japanese steel industry Point 3. Consider the circumstances of India



STEP 2

136 Items Full List

- ✓ Full List covers energy saving technologies in steel industry
- ✓ Technologies in the Full List were chosen from SOACT Handbook, NEDO Handbook and other technology references

17Items 19Items India TCL ver.1.0 &2.0

- ✓ TCL ver1.0 consists of 17 energy saving technologies appropriate for Indian steel makers, and authorized under the India-Japan Collaborative Meeting in Feb 2013
- ✓ Based on the requests from Indian experts, 2 technologies were added to TCL 1.0. Revised list was published as "TCL 2.0" in Feb 2014.





STEP 3

19+αltems

India TCL ver.2.1

- Currently preparing technology description of 5 environmental technologies which is listed as annex of TCL ver2.0
- Also seeking other suitable technologies for India through energy saving diagnosis



Energy Saving Diagnosis in India 2015 (TBD)

Collaborative Meeting in India (TBD)

Energy Saving Diagnosis using ISO14404

- Experts of JISF conducted energy saving diagnosis in Bhilai Steel Plant (Steel Authority of India Ltd.) on 9-13 December 2013 by using ISO14404 and Technologies Customized List.
- Experts estimated that energy saving will be possible by 4% by operational improvement and introduction of recommended technologies, which is equivalent to 600,000 tons of CO2 reduction/year.



Technologies Customized List and operational

experience of the TCL technologies



Energy management method using ISO14404

1) Operational Improvement



Experts recommended to scale up gas recovery equipment in order to optimize combustion in BOF. It will reduce energy by 603 TJ per year.

2) Recommends of technology implementation



Experts recommended 7 technologies listed in Technologies Customized List.

3) ISO14404



Experts prepared ISO 14404 calculation sheet, which automatically calculate energy/CO2 performance.

Technology Transfer to Indian Steel Industry

- If Technologies on Technologies Customized List are transferred to India, it will contribute to 13 million tons of CO2 reduction per year in India.
 - Reduction potential is calculated for 11 technologies out of 19 technologies on TCL. Estimates are unavailable for 8 technologies.
 - Reduction potential is based on the current production capacity in India. Indian steel industry is expected grow rapidly and the potential will also increase.

CDQ (Coke Dry Quenching)

CDQ is a system to recover the sensible heat of red hot coke by means of inert gas. Then by the use of the recovered heat, produce high-temperature and high-pressure steam in a boiler. The steam produced without additional energy is used for the generation of electric power, production of steel, etc.



7 CDQs are implemented

from Japanese companies to India triggered by NEDO model project

TRT (Top Pressure Recovery Turbine)

This system generates electric power by employing blast furnace top gas to drive a turbine generator. After the blast furnace gas is used in power generation, it is used as a fuel in iron and steel manufacturing processes.



3 TRTs are implemented

from Japanese companies to India

Collaboration with ASEAN Steel Industry ~ ASEAN-Japan Steel Initiative ~



Thank you

