Factsheet

Energy Efficiency for Iron and Steel Industry

Sector Highlights

Census of Manufacturing Establishments (CME) carried out in the fiscal year 2011/12 by the Central Bureau of Statistics (CBS) has kept Metal Industry into three different classes namely a) basic iron and steel, b) structural metal products, and c) forging pressing and stamping of metal. Iron rod, steel rod, stainless steel, cast iron pipe, tin sheet etc are some of the export items of this industry. The number of basic Iron and steel industries in Nepal is 20 with employment of 4,917 persons (CME, 2012/13). The sub-sector output value is estimated to be NPR 31.10 billion and contributes the input value of NPR 27.34 billion with addition of about NPR 3.75 billion. The average installed capacity of the plants in this sub-sector is 113 Tons per Day (TPD) and average production is 63.7 TPD (GIZ/NEEP 2012).

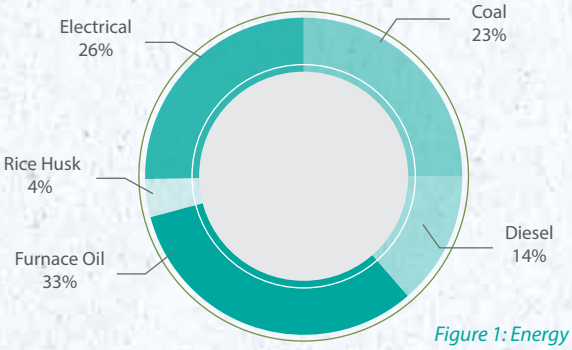
Nepal Iron and Steel Industry by numbers

20 Iron and Steel Industries
113 TPD Installed capacity
NPR 31.10 Billion revenue*
4917 person employment*
3% energy costs

*Census 2011/12, update not available

Energy Use

Main sources of energy used in the Iron and Steel industries in Nepal are furnace oil, electricity and coal. Coal is mainly used in the re-heating furnace for billet heating. Furnace oil or diesel is also used in place of coal by some industries. Nepal Electricity Authority (NEA) is the only supplier of Electricity. All industries have installed Diesel Generator for backup power supply during power outage mainly for the lighting and maintenance activities of the industries. However, the production ceases during the load shedding.



The energy cost on product value is 3% for the iron and steel sector. Energy saving potential for the sector is estimated to be 6% for Electrical and 23% for thermal

Figure 1: Energy use in Nepalese Iron and Steel industry (GIZ/NEEP, 2012) [1]

Specific Energy Consumption	Baseline 20121	2015 Scenario	Potential Target
Electrical	149 kWh/T	100 – 125 kWh/T	95 – 125 kWh/T
Thermal	351 Mcal/T	425 – 480 Mcal/T	210 – 285 Mcal/T

Table 1: Specific energy consumption per ton of product in Nepalese Iron & Steel Sector

Experiences from the past have identified many energy saving options for the iron and steel sector that are highly profitable with the payback period of equal or less than 4 years.

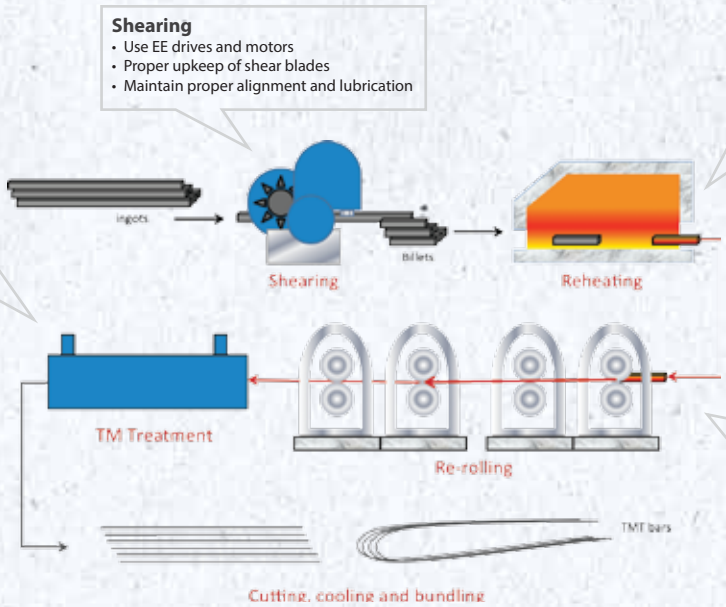
Option	Payback of investment
Energy Saving by Compressed air leakage avoidance	Immediate
Waste heat recovery by installing metallic recuperator	Immediate
Fuel Oil Preheating	Immediate
Reheating Furnace Automation	Less than 1 year
Power Factor Improvement from 0.8 to 0.95	8-14 Months
Fuel Substitution	1 to 2 years
Adoption of Variable Frequency Drive for Combustion Air Fan Drive of Reheating Furnace	2 to 3 years
Energy Saving in Water Pumping of rolling mill and Pump Oil Cooling	3 to 3.5 years

Table 2: Energy saving option and payback period of investment for Steel & Metal sector (EEC/NEEP, 2015[2])

[1] GIZ/NEEP, 2012: Baseline study of selected industries.

[2] EEC/NEEP, 2015: Pre-market assessment of audited industries

Energy Saving Tips



General measures

- Ensuring proper fuel storage, handling, and preparation, for achieving good combustion conditions
- Recover maximum heat from flue gases
- Balance kilowatt loading on three phases of supply
- Shift loads to off-peak times where possible (load management)
- Correct power factor to well above 0.95 by installing additional capacitors and automatic power factor controllers
- Use variable-speed drives for large variable loads

Case Study

Energy Audit conducted by EEC under NEEP, recorded specific energy consumption (SEC) of 102kWh/Ton of electricity and 477Mcal/Ton of Coal in one of the re-rolling mills with a total capacity of 33,000T/year. The industry was able to reduce its specific energy consumption to 95 and 281 respectively after implementing the recommended energy efficiency measures: investing NPR 25 millions, the industry was able to make a saving of NPR worth 38 million annually.

During Energy Audit (SEC) :	102 kWh/T and 477 Mcal /T @ Coal
After Implementation (SEC) :	95 kWh/T and 281 Mcal /T
Savings Per Ton:	7kWh and 196 Mcal
Total Production:	33,000 T/Year
Annual Savings made :	231, 000 kWh and 6,468,000 Mcal
Monetary Savings made:	2,079,000 @ 9/kWh and 35,933,000 @ 25/ Kg of Coal and 4500Kcal/Kg of Coal
Total Investment Made:	Rs. 25,604,000

Table 3: A success case from NEEP (EEC/NEEP, 2015)

Contact details

If you are interested to know more about energy efficiency, please, do not hesitate to contact us!

- If you are a business man
get information about energy saving opportunities in your company and get an energy audit done by our professional expert team
- If you are an engineer
explore the articles in our energy efficiency knowledge website and participate in our training programs
- If you are a banker...
participate in our awareness raising seminars and explore the new market of energy efficiency investment.
- If you are an energy auditor...
register in our database of energy efficiency professionals and be listed on our webpage.
- If you are a supplier for energy-efficient technology
register in our online B2B portal and list your products and services.

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