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Energy Efficiency Centre
FNCCI, Teku, Kathmandu
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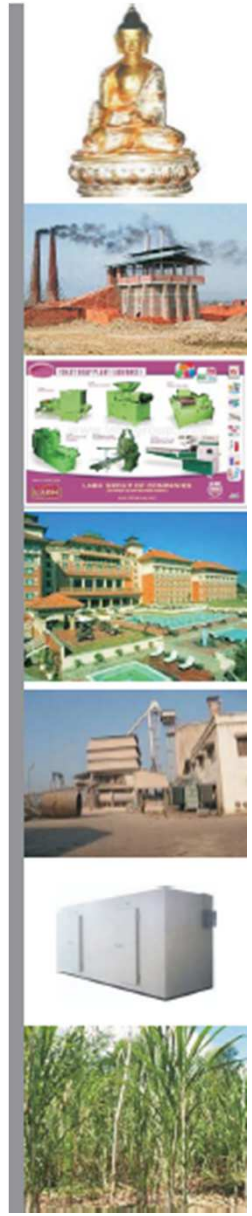

BRIEF ON BASELINE STUDY FINDINGS OF SELECTED SECTOR/ INDUSTRIES.

Background

- *Scope for efficient use of energy in Nepalese industries.*
- *GON and GOG signed agreement for NEEP to promote efficient use of energy*
- *GIZ and WECS as implementing agencies – FNCCI has established EEC*
- *Consulting Company awarded by GIZ to conduct a baseline study of industries comprising eight sectors of industries namely Cement, Pulp & Paper, Food, Metal, Soap & chemicals, Hotel, Brick, and Cold storage*

Selection

S. No.	Sector of Industry	Population	Sample size
1	Cement	35	26
2	Pulp & Paper	7	5
3	Food	139	51
4	Metal	64	21
5	Soap & Chemicals	38	19
6	Hotel	188	39
7	Brick	435	27
8	Cold Storage	23	12
	Total	**929**	**200**

Cement Sector

Observations

- *Two types of cement plants*
  - ✓ *Limestone based*
  - ✓ *Clinker based*
- *Limestone based plants use electrical as well as thermal energy (coal) as fuel for Sintering process*
- *Clinker based plants use electrical energy*
- *Motors used are old, rewound and of standard efficiency*
- *NEA supply is from 66/33/11 kV with TOD metering*
- *Capacitor banks are installed to improve P.F.*
- *Face problem of voltage fluctuation and low voltage supply*
- *Production hampered by load shedding*

Pulp & Paper Sector

Observations

- *Electrical as well as thermal energy from rice husk in boiler*
- *Capacitor banks used to improve power factor more than 0.9*
- *Combustion efficiency is not checked for boilers*
- *Steam leakages observed*
- *Insulation not satisfactory*
- *Frequent non-scheduled power cuts result in production loss*
- *High cost of Generated electrical energy*

Food Sector

Food Sector

Sub-sectors

- *Beverage*
- *Biscuit*
- *Dairy*
- *Noodle*
- *Sugar*
- *Vegetable oil & Ghee*

Observations

- *Food industries consume both electrical and thermal energy.*
- *Diesel boiler used most for backup.*
- *Use of inefficient motors.*
- *Steam leakages are observed.*
- *Improper Insulation*
- *Power factor not manage well.*

Metal Sector

Observations

- *Iron and Steel industries are installed with heavy motors and electrical energy is mainly used for the drives of rolling mill, billet sharing, pumps, compressor, blowers and wire plant motors*
- *Motors are old and re-winded*
- *Capacitor banks are used to improve power factor*
- *Furnace is used mainly with coal, FO and diesel and workplace is warm/hot indicating insufficient insulation*
- *Frequent power cuts affect production*

Soap & Chemical Sector

Observations

- *Laundry soap is the main product*
- *Small scale pan boiling units use firewood medium and large units use rice husk fired boiler*
- *Only few industries uses capacitor bank*
- *Combustion efficiency is not checked*
- *Leakages are seen*
- *Insulation not adequate – pipes, flanges and valves are not insulated*

Brick Sector

Observations

- *Majority of brick industries are BTK (fixed chimney)*
- *Energy use in brick kiln is coal and coal is imported from India*
- *Electricity is used for lighting and drives*
- *No significant disturbance in production by load shedding*
- *Insulation inefficient*
- *Inefficient coal feeding practice*

Cold Storage Sector

Observations

- *Potatoes and fruits are the main products stored*
- *They consume only electrical energy for cooling process*
- *The rate of electricity charge is subsidized 50% by NEA*
- *All units have DG for backup.*
- *Motor loadings are not checked*
- *Power factor is low – none used capacitor banks*
- *Many incandescent lamps are used*
- *Air curtains are not used*

Energy Intensity regional VS Baseline

Sector	Electrical Intensity	
	Regional (kWh/MT)	Baseline (kWh/MT)
Cement Limestone Base	105	148.5
Cement Clinker Base	35	48.68
Pulp & Paper	1175	937.49
Metal	200	149.17
Soap & Chemical	-	111.25
Brick (BTK Fixed	-	21.27 kWh/1000 pcs
Cold Storage	-	283.53

Energy Intensity regional VS Baseline

Sector	Thermal Intensity	
	Regional (MJ/MT)	Baseline (MJ/MT)
Cement Limestone Base	3,138	5,411.26
Cement Clinker Base	-	-
Pulp & Paper	16,412	15,434
Metal	1,500	1,470
Soap & Chemical	-	3,378
Brick (BTK Fixed	2,215 MJ/1000 pcs	3,951 MJ/1000 pcs
Cold Storage	-	-

Areas of Potential Savings

- *Efficient motors*
- *Power factor improvement*
- *Improvement in insulation of the cold pipelines, storage room walls and ceiling*
- *More efficient belt and pulleys*
- *Partition of cooling areas, installation and effective use of air curtains*
- *Regular cleaning and maintenance of condenser pipes*
- *Replacement of incandescent lamps*
- *Minimization of leakages of compressed ammonia gas*

Recommendations

- ***Energy audits must be carried out periodically in all the industries so that opportunities are known and understood***
- ***Awareness & training about EE***
- ***Financing for the implementation of energy saving options – mobilize financial institutes and banks***
- ***Keeping the record of data and monitoring***

Recommendations

- ***Institutionalizing energy audit expertise***
- ***Focus on best practices and best available technology on energy***
- ***Policy with mandatory periodic energy audits and reporting***
- ***Involve educational institutions for offer course on EE***
- ***Competition and award for improvement in EE by sector***

Thank you