

# Electricity Management from the Consumers' Perspective

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## Introduction

- Ladhuram Tamang, Birth Place: Bhojpur
- Education: Graduation in (Electrical)-Delhi College of Engineering, Delhi University, (Entrepreneurship course), EMBA, Ace Institute.
- Entrepreneur: Founder and executive Director at Hyonjan Electrical Engineering fabricator P. Ltd. BID, Balaju. ISO9000 certified company on (Energy Auditing, Manufacturer of Control Panel, Electrical Contracting, Authorized Distributors and Consulting Works).
- Professional Experience: NEC, Nepal Electricity Authority, NPEC (11000/400Volt, 25KVA, Distribution Transformer first time - produced under my design-1988 and supplied in Water Supply projects), EMCO Transformer-Mumbai, various Industries such as cement, process, Hospitals, Banks, Malls, UNDP, GIZ etc as a design expert/Consultant/Manufacturer.
- Societies: President, SEEN and Nepal Elect. Contractor Association,
- Article Published: Kantipur Daily, Gorkhapatra, Karobar, Engineering Magazine, Professional organizational magazines other national newspaper etc, and Radio Program on Energy in Radio Sagarmatha.

# 1. Electricity Management from the Consumers' perspectives

Businesses today are more focused on “managing” energy than at any other time in recent decades and seen as a strategic business concern, whether it be:

- Guaranteeing supply availability at predictable costs.
- Maximizing efficiency to reduce use, cost and environmental impact or
- Developing new infrastructures new business opportunities.
- Energy Security despite rising energy cost.

## 2. Need of Energy Management at Customer's level

- ❖ Electricity loss is 25% or more and growing
- ❖ Higher Per unit cost in than in neighboring countries
- ❖ High demand, (Less-Active Power ) for the same services
- ❖ High infrastructure investment for electrical/civil works /equipment
- ❖ Pro-loss Tariff.
- ❖ Consumers habit building in Energy management/responsibility of consumers
- ❖ Low employment opportunity
- ❖ Lack of awareness/Technical benefit/ Potential energy saving to utility/consumers.
- ❖ Inherent loss in devices.
- ❖ Assure-reliability
- ❖ Creates New markets platform

# 3. Role Played by Government in Energy Management

- NEA prepared the specifications on CFL and CFL distribution program conducted in some selected Districts.
- Nepal Electricity Authority has demand side Management division.
- TOD metering in bigger installation above 60 KVA.
- Distribution Transformers of low loss-finalize up to 300KVA.
- Import subsidy in capacitor Banks. (Maoist regime)

## **4. Role played by NGO, INGO etc.**

- FNCCI with Donor agencies, Danida, GIZ, Norad fund, AEPC –testing labs/solar etc.(Energy Audit in the factory and trainings)
- Electrical /Mechanical Engineers, Architects, NEEMA, NECA, SEEN and professional societies/Dealers.

## 5. Roles Consumers played and Payback Period Scenario

- Induction heaters (PF Issues), Replacement of Incandescent lamps by higher PF CFL, LED,(PF and quality issues) and Star rated Freezers, computer, MCB,TV, (Buy star not the brand),higher PF water pumps, Reactive power management by industries, as per their knowledge and understandings
- Lobbying in making favorable and consumer friendly-tariff

## 6. Consumers' Role in Energy Savings

### First Priority: Domestic

Target Parameter	EE/DSM Options
Lighting Load	Promote high PF CFL, T8/T5, LED and Electronic Ballast
Tariff	<ul style="list-style-type: none"><li>• Energy charge as per consumption (No block Tariff)</li></ul>
Household Equipment (Standards and cabeling)	<ul style="list-style-type: none"><li>• Air conditioners</li><li>• Refrigerators</li><li>• Water pumps</li><li>• Protection equipments, sensors</li><li>• T.V</li></ul>

Payback : 9 to 12 months at maximum



## 7 .Consumers' Role in Energy Savings Second Priority: (Non-Domestic Non TOD - Sector)

Target Parameter	EE/DSM Options
Lighting Load	<ul style="list-style-type: none"> <li>• Promote CFL, T8/T5, Electronic Ballast</li> <li>• HPS and LED for Street Lighting</li> </ul>
Tariff	<ul style="list-style-type: none"> <li>• Introduce TOD tariffs and encourage load shift</li> <li>• Introduce PF Charges, KVA metering</li> </ul>
HVAC (Heating Ventilation and AC)	<ul style="list-style-type: none"> <li>• Periodic cleaning and maintenance program</li> <li>• Zoned cooling/heating</li> <li>• Control system</li> </ul>
Motive Load (Industrial customer)	Efficient Motors, VFD, Correct Sizing of electrical equipments

Payback : 9 to 15 months at approximately

## 8. Third Priority: (TOD Customers - Sectors)

Target Parameter	EE/DSM Options
Motive Load (Industrial customer)	Efficient Motors, VFD, Correct Sizing of electrical equipments
Tariff	<ul style="list-style-type: none"><li>• Encourage TOD tariffs by load shift</li><li>• Introduce PF Charges with incentives and penalty clauses</li></ul>
Chillers/refrigeration	<ul style="list-style-type: none"><li>• Periodic cleaning and maintenance program</li><li>• Insulation/draught reduction</li></ul>
Compressed Air/Steam Supply Systems	<ul style="list-style-type: none"><li>• Insulation</li><li>• Leakage reduction</li></ul>
Compressed Air/Steam Supply Systems	<ul style="list-style-type: none"><li>• Insulation</li><li>• Leakage reduction</li></ul>
Load Shifting	Water pumping/storage, drying, heat/cold treatment, mixing

Payback : 12 to 18 months at approximately

# 9. Benefit Analysis:

Sector	Measures/Technology	Load Shape Objective		Benefit Cost Ratio	
Measures Analysed for DSM potential		Peak load Clipping	Energy Efficiency	Participant	TRC
Residential	CFL replace incandescent Lamps	✓	✓	Very High	Very High
Residential	T8 Fluorescent replace T12 Fluorescent	✓	✓	Fail	Low
Residential	LCD TV replace CRT TV	✓	✓	Fail	Marginal
Industrial	High Efficiency Motors		✓	High	High
Industrial	Power Factor Control	✓		Medium	Fail
Industrial	Energy Service Company Contracts	✓	✓	High	High
Commercial/Non	CFL replace incandescent Lamps	✓	✓	Very High	Very High
Commercial/Non	T8 Fluorescent replace T12 Fluorescent	✓	✓	Fail	Fail
Commercial/Non	Energy Service Company Contracts	✓	✓	High	High
Considered but Rejected					
Residential	Replace electric cooking with gas/kerosene	✓		Likely fail	Likely fail

Data: World Bank

The overall benefit is only possible by creating awareness to the consumers.

# 10. Constraints in energy management

- Electrical Trained man Power shortage in the market. (Heavy influx from neighboring country)
- Electrical Inspectors License Issuing Authority for electricians/fitters.
- One Government agency doing consulting, contracting and power supply in most of premises.
- No Government energy conservation policy and Act.
- No Commitment by Higher Authorities on Energy Conservation in the organizations.(Stickers etc.)
- No Budget allocation for energy conservation activities and awareness programs.
- Electricity Tariff/ Exceed contract but Demand charges the same. Penalty clause, 3% loss, 50% demand charges, (block-charge-min-One step ahead)
- BPL charges-30 Rupees Min Charges

## **11. 2058 Tariff - restructuring:**

Issues on (Block Tariff, delay payment penalty, losses charges, Block P.f charges, Incentives for P.f improvement and penalty for lower P.f demand reduction - incentives, KVA/MVA, Demand reset, demand charge - Adjustment, commercial and non commercial tariff - Adjustment), 50% of the total sanctioned KVA etc - to be re-structured as per consumers' suggestion and international practices.

# 12. Constraints

- No Tariff to encourage for Investment/Incentives/Penalties and PF based Tariff.
- Proactive approach of NEA is Earn hard cash (Indian-Reliance Power Tariff)
- Rules of bulk energy supply, Dedicated Feeders, Industrial Districts, (25% cut off lines and backup system) as per Hakim ko Tajbij.
- No Smart Energy Wings- in Ministry.
- No Standard and labeling standards, Graphical symbols (Freezer, MCB, computers, star rated equipment), Graphical symbols not yet implemented.

- No Electrical Construction Act/ Civil Act Activation on electrical contract.
  - High custom in capacitor banks, high power factor goods.
  - Free Import non efficient electrical goods.
  - No update in Nepal Building Electrification Code, NEA construction Standards (Leakage Controllers, Cables, details, etc.
- ❖ NEA-Poor thinking (More KVA-More Bill, Search for hard Cash.
- Case study- 100 factories, saving 100KVA, Rs. 210/-per month 2100,000/-)
- (Might reduce- bite, salary, pensions, etc.)-who cares savings of 10MVA energy.



# 13. Energy Optimization Method to be adopted by consumers

- Avoid Loadings at peak demand period as far as possible.
- Use electrical devices of higher power factor/efficient (CFL, LED, MCBs, Pumps, Motors, freezer, TV, Computers, etc.)
- Have Energy Audit done. Government should take initiatives like in neighboring country.
- Run system in full loads as far as possible.
- Use adequate size Capacitor Banks after energy audit works.
- Use electrical devices as and when required. The no load loss is around 1-2% of total demand and lighting contributes 65% of the KVA, demand in the country.



## **14. Way Forward: (Yes we can do with our Engineers)**

1. 30% energy savings found in Industrial districts of Nepal as per GIZ consultant –Stefen Landeur.
2. Delhi Metropolitan saved 12% energy in 2012 only domestic consumption by energy management at consumers' level and tariff restructuring.
3. Implement consumers friendly tariff after interaction with stake holders and all relevant points as mentioned above for electricity security.
4. Confidence building to ensure pay back period with prescribed period.

5. By restructuring the current tariff, NEA can also save millions worth of energy ensuring efficient power system.
6. Ensure, Representation of electrical associations, consumers association, etc. in the decision making level, electrical projects, such as Bidhyut Board, tariff Board, etc.
7. Ensure, Electrical Contractors' Act, Electricity Conservation policies, update building, factory Electrification codes practices, etc.

Generation and electricity management should go side by side,  
Demand side management is not going to be a option.

Thanking You