Energy Efficiency & Demand Control programs

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What is energy efficiency?

Energy efficiency is the measure of the useful energy produced compared to the energy converted to low quality-- usually heat.

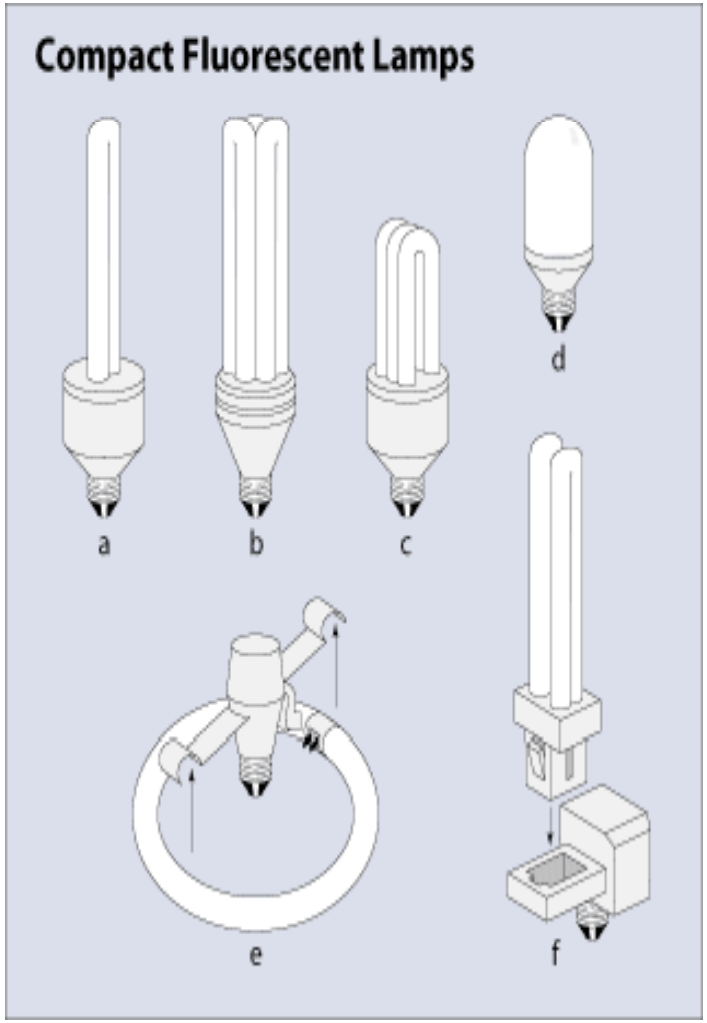
Using energy to do work, not produce heat.

What is energy conservation?

Implementing new technology to do same work using less energy.

- Heating homes more efficiently
- Lightning spaces more efficiently

SAVES $$$, produces less pollution, reduces CO2



Why EE&C in Electrical sector?

1. Reduces oil imports -Jordan is lacking conventional sources of energy, the country needs to import almost all of its fuel needs (96%)

2. Achieve security of oil derivatives & electricity supply

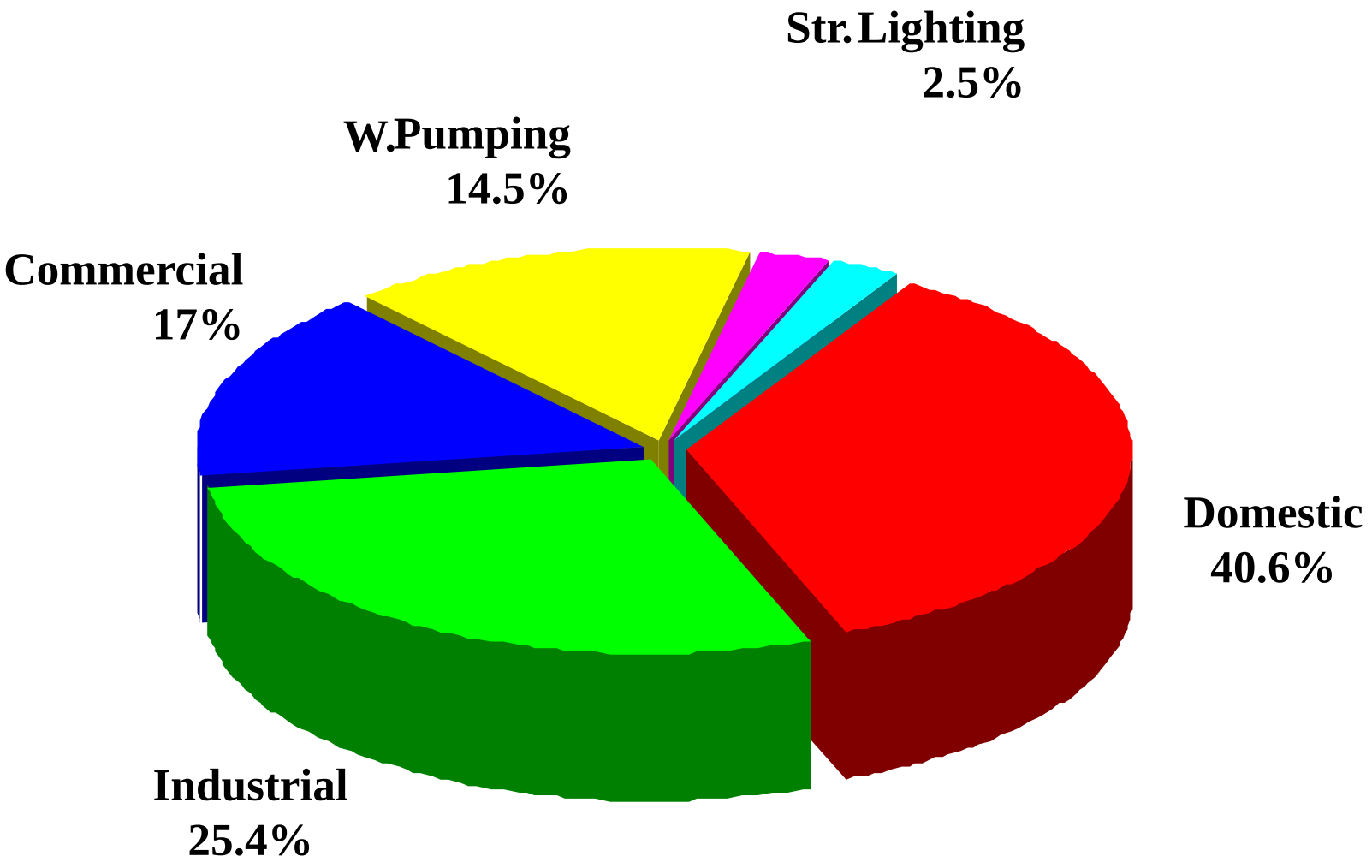
3. To face the accelerating growth in the unexpected demand for electricity, and the great challenge represented in securing necessary investments to meet such demand

4. Improves local economy by reducing flow of money out to pay for energy

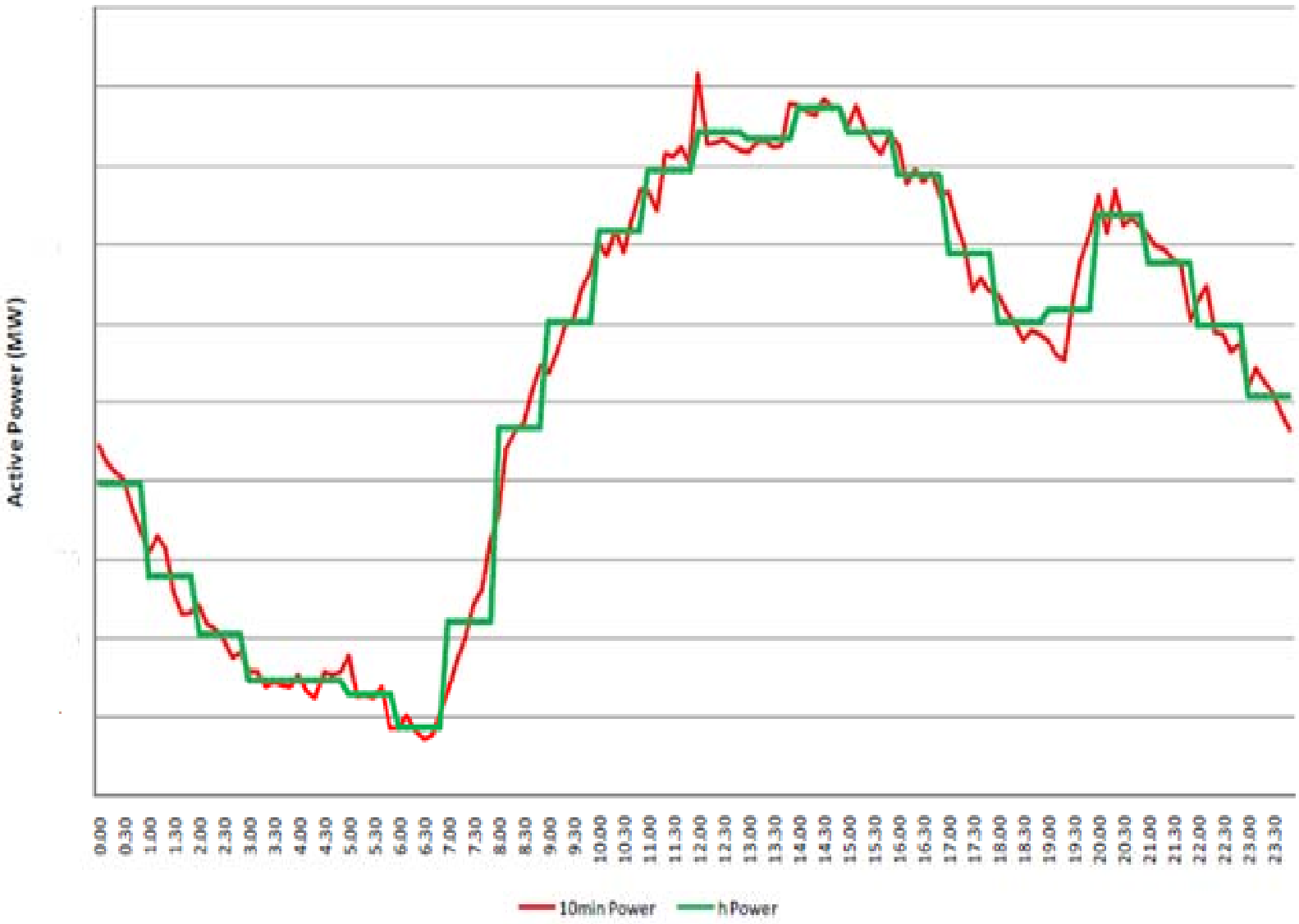
5. Reduce Electrical consumption

6. Reduce production cost and improve competitiveness of local industries.

Electricity Consumption(2011)



Daily load Curve



PROBLEMS

Related problems organized in groups

- Lack of education/awareness/sensitization
- Lack of information about Energy Efficiency programs or laws
- Low community commitment for energy conservation

- Inefficient buildings (existing and new constructions)

- Inefficient appliances on the market (cheap products)

- Lack of Energy Efficiency policies and planning

- Lack of knowhow for developing efficient technology

- High cost of efficient apliances and equipments
- Energy cost

MEASURES

to minimize or solve problems.

Sustainable development needed: social, economic and environmental.

Use media and publicity for sensitization/awareness
Introduce EE theme in all education system curriculum
Motivation strategies to enhance commitment in EE&C

Buildings EE assessment and labeling system
Renewable sources, technology/materials, lifestyle

Setting labeling system for appliances and equipment

Energy Efficiency policies and planning
Codes, standards and normalization for EE in ≠ areas
Data management (surveys)

Technical training and capacity building at all levels
Stimulating international partnerships

Governmental subsidies
Tax reduction for EE apliances
Revise the tariff system to adequate costs

Demand Control

What is Demand Control?

Is the procedure to be followed by Transmission System Operator (TSO) and Users to initiate reduction in demand in the events that may lead to frequency variations outside the limits, and prevent abnormal overload of apparatus within the transmission system, or to prevent a voltage collapse.

Methods of demand reduction:

1. Automatic Under Frequency Load Shedding (UFLS).

2. Demand reduction initiated by TSO.

3. Consumer demand management initiated by TSO.

Automatic Under Frequency Load Shedding (UFLS).

The Under frequency Load Shedding scheme is implemented in six stages depending on the frequency value and its rate of reduction:

Stages	Frequency (Hz)	Frequency rate (df/dt)	Time Delay (sec)	Percentage of Load (%)
First stage	49.1	-0.7	0.15	6.71
Second stage	49.0	-0.7	0.15	12.05
Third stage	48.8	-0.7	0.15	10.49
Forth stage	48.6	-2.0	0.15	9.14
Fifth stage	48.4	-	0.15	7.96
Sixth stage	48.2	-	0.15	11.65

- Following frequency recovery after the activation of the UFLS scheme, should the system condition still critical, the NCC may request the Distribution Network Service Provider (DNSP) and the Users to implement manual demand disconnection of additional demand.

Demand Reduction initiated by TSO

Objectives:

- Preventing any overloading of apparatus.
- Conserve primary fuel in the event of shortage.

statistics

Date	Interrupted Load		Average
	MW	(Shed /Sys) %	Min
03/08/2010	210	8.2%	68
04/08/2010	145	5.8%	55
07/08/2010	109	4.7%	36
08/08/2010	112	4.6%	73
09/08/2010	150	7.1%	8
17/08/2010	50	2.2%	34
18/08/2010	152	6.6%	57
19/08/2010	70	3.1%	44
	45	2.1%	
21/08/2010	70	3.0%	44
	150	7.0%	
29/08/2010	140	6.4%	16

Date	Interrupted Load		Average
	MW	(Shed /Sys) %	Min
17/05/2011	208	11.2%	22
23/05/2011	101	5.5%	12
25/05/2011	14	0.8%	25
05/06/2011	135	6.4%	47
14/06/2011	6	0.3%	5
12/07/2011	180	7.9%	35

Date	Interrupted Load		Average Duration
	MW	(Shed /Sys) %	Min
14/06/2012	105	4.5%	41
17/06/2012	130	5.0%	48
17/06/2012	85	3.5%	44
18/06/2012	135	5.3%	26
17/07/2012	100	3.8%	70
18/07/2012	267	9.8%	105

conclusion

- By implementing the energy efficiency program we able to:

✓ reduce the energy consumption

✓ reduce the fuel import

✓ Achieve security of oil derivatives & electricity supply

✓ Positive attitude towards environment

✓ Much has been done, but much more can be done

THANK YOU

But first…

Step 1: Planning and Organization

- task 1a: Meeting with top management
- task 1b: Form a Team and inform staff
- task 1c: Pre-assessment to collect general information
- task 1d: Select focus areas
- task 1e: Prepare assessment proposal for top management approval

Step 2: Assessment

- task 2a: Staff meeting and training
- task 2b: Prepare focus area flow charts
- task 2c: Walkthrough of focus areas
- task 2d: Quantify inputs and outputs and costs to establish a baseline
- task 2e: Quantify losses through a material and energy balance

Step 3: Identification of Options

- task 3a: Determine causes of losses
- task 3b: Identify possible options
- task 3c: Screen options for feasibility analysis

Step 4: Feasibility Analysis of Options

- task 4a: Technical, economic and environmental evaluation of options
- task 4b: Rank feasible options for implementation
- task 4c: Prepare implementation and monitoring proposal for top management approval

Step 5: Implementation and Monitoring of Options

- task 5a: Implement options and monitor results
- task 5b: Evaluation meeting with top management

Step 6: Continuous Improvement

- task 6a: Prepare proposal to continue with energy efficiency for top management approval

- ✓ Preparation and implementation of **Public Awareness Program** in the field of energy efficiency.
- ✓ Establishment of Energy Data Bank
- ✓ Elimination or reduction of **Custom Duties & Sales Tax** on materials and equipment that contribute to energy saving including thermal insulation materials.

✓Oblige importers and manufacturers of energy consuming appliances to fix "Energy Efficiency Label " indicating the annual consumption of the equipment" on their product.

✓Enforcement of "Building Codes", in particular, parts related to energy efficiency

- ✓ Preparation of "Energy Efficiency Code“
- ✓ Design and implementation of Energy Efficiency Training Programs for those who are involved in energy efficiency

- ✓ Implementation of energy efficiency **Demonstration Projects** like energy saving lamps, efficient street lighting and solar water heaters
- ✓ Design and implementation of energy efficiency projects in the **water sector**
- ✓ Promotion of **renewable energy** technologies