

Energy and Water Conservation Project



Implemented at
Nutridar Company

Children's Museum Integrated Building
Sustainability Project Proposal Confidential
Property of GreenTech

Table of Contents

Introduction

Energy and Water Conservation Project

Results of Implementation

Results of Industry Survey Project

Nutridar Company

Located in Na'ur, 20Km West of Amman

Plant Includes:

Milk Processing & Sensitive Ingredients Mixing Facilities

Can Packing Lines

Sachet Packing Lines

Cereals Production Line (Roller Dryer)

Introduction



Introduction



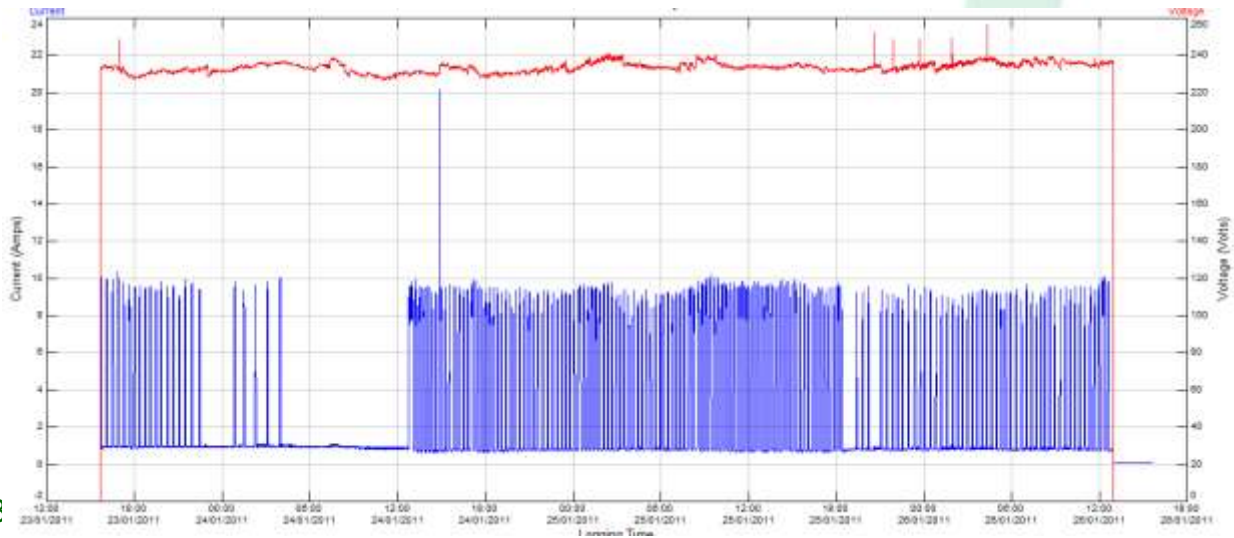
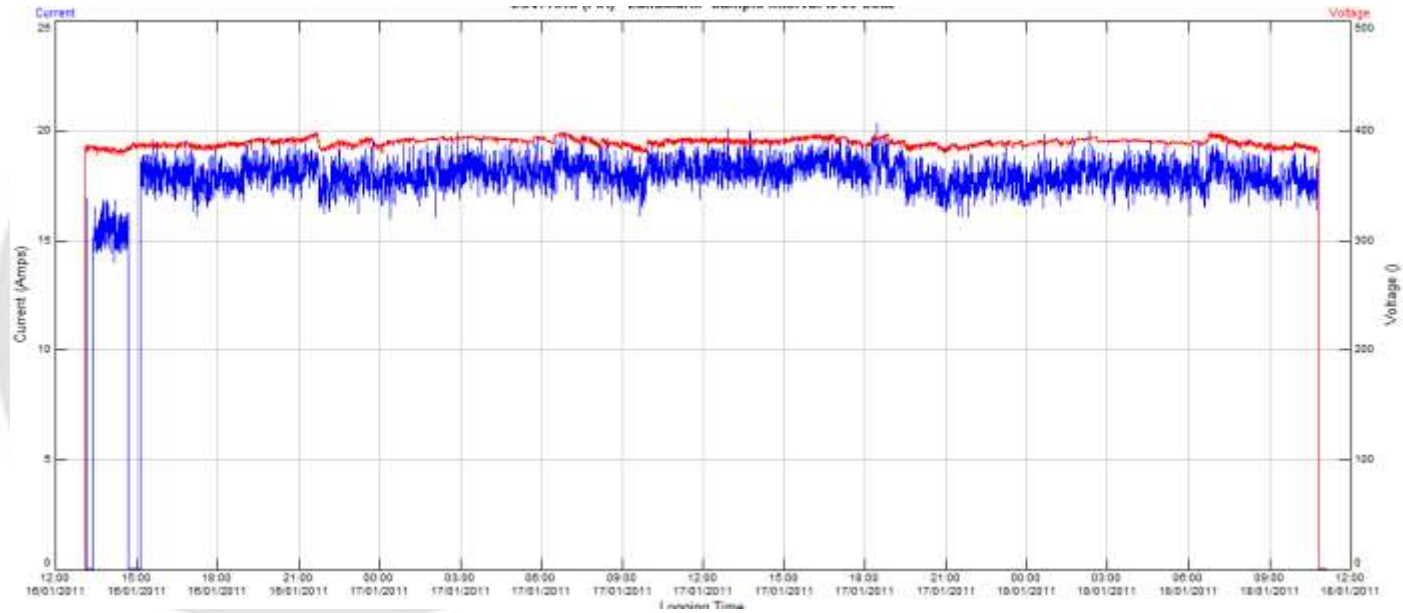
Energy & Water Conservation Project at Nutridar Factory

- Audit was conducted in Jan-2011
- Implementation was concluded between July 2011 to Dec 2011

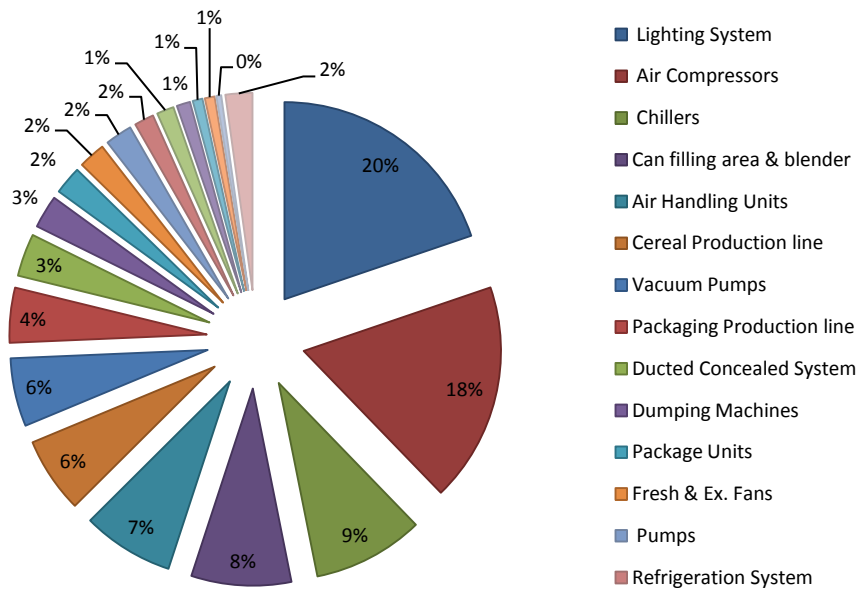
OVERALL FACILITY CONSUMPTION



Measurements



Energy Use Breakdown



No.	Description	KW	Annual Consumption kWh/yr	Annual Cost JD	Percentage %
1	Lighting System	76.2	213,636	11,363	19.8%
2	Air Compressors	58.6	194,188	10,329	18.0%
3	Chillers	70.0	98,784	5,254	9.1%
4	Can filling area & blender	18.7	87,993	4,680	8.2%
5	Air Handling Units	23.5	80,748	4,295	7.5%
6	Cereal Production line	18.6	66,896	3,558	6.2%
7	Vacuum Pumps	14.4	60,752	3,231	5.6%
8	Packaging Production line	14.5	48,870	2,599	4.5%
9	Ducted Concealed System	23.2	38,047	2,023	3.5%
10	Dumping Machines	8.1	29,160	1,551	2.7%
11	Package Units	9.7	24,476	1,301	2.3%
12	Fresh & Ex. Fans	8.3	24,261	1,290	2.2%
13	Pumps	8.8	24,171	1,285	2.2%
14	Refrigeration System	3.2	16,819	894	1.6%
15	Hopper Machines	4.1	14,652	779	1.4%
16	Dextrination & mixer	3.3	12,024	639	1.1%
17	Air Dryers	2.3	8,350	444	0.8%
18	Burners	4.7	8,119	431	0.8%
19	Elevator	4.0	4,032	214	0.4%
20	Others	5.7	22,997	1,259	2.2%
TOTAL		380	1,046,670	57,427	100%

Audit Recommendations

Fuel System

- Boilers Calibration & Cleaning
- Maintain The Blow down Valve & Blow down Network.
- Maintain Faulty Steam Traps & Flanges
Insulating steam valves to reduce dissipated heat.
- Modify The Solar System Network.
- Reflection Of Water Saving On Diesel Consumption



Audit Recommendations

Fuel System

- Modify The Solar System Network.
- Reflection Of Water Saving On Diesel Consumption



Audit Recommendations

HVAC System

- Control the indoor temperature of the administration building.
- Control the operation of chilled and hot water pumps using VFDs.



Compressed Air Systems

- Reduce Air Leaks in the Compressed Air Network.
- Reduce pressure setting of Air Compressors



Loads Management

- Reduce the Maximum Demand Charge by implementing various measures.



Audit Recommendations

lighting system:

- Install Electronic Ballast on Fluorescent Fixtures.
- Install presence sensors in less occupancy rate areas.



Domestic Water System

- Install Dual Flush Mechanism for The Toilets.
- Install Water Efficient Faucets & Shower Heads on the existing heads.



Results of Implementation

Energy Conservation Measure	Savings (kWh or Lit / month)	Savings (JOD / month)
Boilers Calibration & Cleaning	491	250
Maintain The Blow down Valve & Blow down Network.	673	343
Maintain Faulty Steam Traps & Flanges	232	158
Reduce the dissipated heat of steam valves by fiber glass insulation	74	85
Modify The Solar System Network	85	44
Reflection Of Water Saving On Diesel Consumption	28	15
Control the indoor temperature of the administration building	384	21
Control the operation of chilled and hot water pumps using VFDs	605	33
Install Electronic Ballast on Fluorescent Fixtures	3,005	160
Install presence sensors in less occupancy rate areas	1,347	72
Reduce Air Leaks in the Compressed Air Network	1123	60
Reduce pressure setting of Air Compressors	1604	85
Reduce the Maximum Demand Charge by implementing various measures.	37 kW	141
Install Dual Flush Mechanism For The Toilets	9,547	20
Install Water Efficient Faucets & Shower Heads Instead of The Existing Ones	35,490	76
Total Monthly Savings		1,520
Total Annual Savings		18,240

Results of Implementation

Annual Energy Bills : JD 107,294

Total Annual Savings : JD 18,240

Percentage of Energy Saving: 17 %

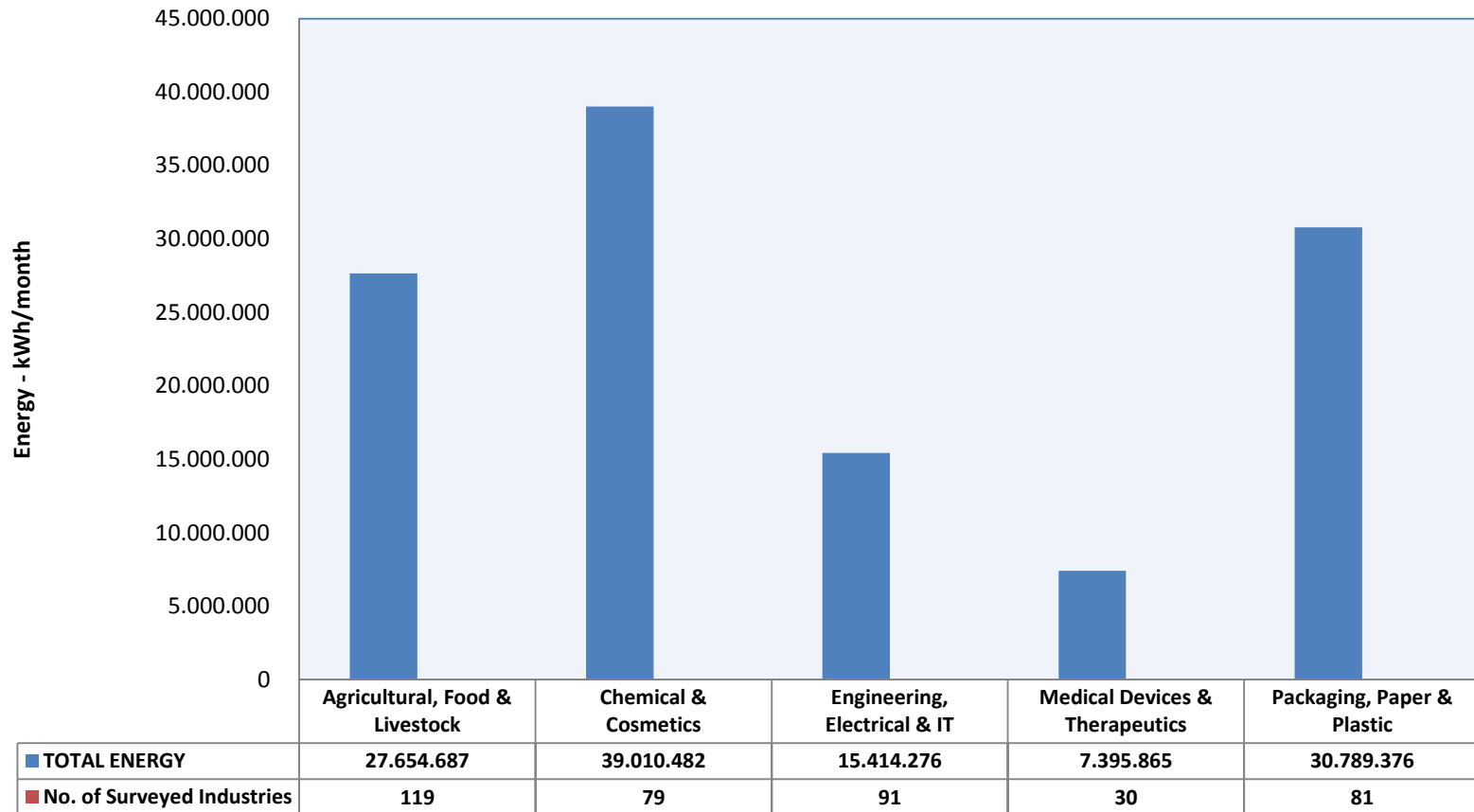
Investment: JD 20,552

Payback: 13.5 Months

Implementation of High Payback period Measures (8-10 years)

- Replacing fixed speed air compressors with VFD.
- Heat recovery from the accumulated Ice on the N2 evaporators.
- Installing economizer on the boiler stack.

Industry Survey



Total energy Consumption
Annual Energy Consumption
Annual Cost

= 120,264,686 kWh/month
 = 1,443,176,232 kWh/year
 = 93,806,455 JD/year



Industry Survey

