



MINISTRY OF FINANCE
GOVERNMENT OF PAKISTAN



Business Support Fund

SMART Energy Program

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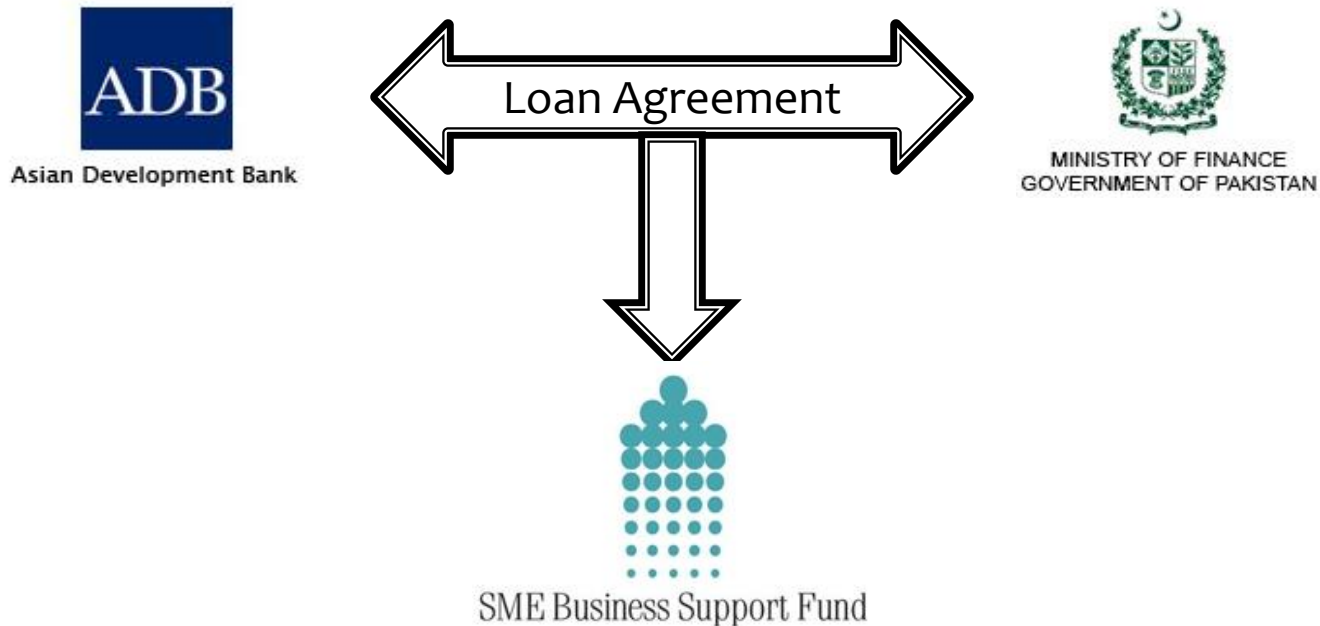
Presentation Overview



Business Support Fund

- ▶ Introduction to SME Business Support Fund
- ▶ Sharing of results – Pre Audit conducted at Quaid-e-Azam (Kot Lakhpat) Industrial Estate Lahore
- ▶ Overview of the SME Energy Efficiency Outreach, Research and Demonstration Support Services Program
- ▶ Way forward

ORIGIN OF BSF



- Established in 2005
- A Guarantee Ltd Company under Section 42 of Companies Ordinance 1984
- 9 Board Members
- Total Outlay of USD 5.7 M (For grant allocation)

BSF: A KNOWLEDGE DRIVEN ORGANIZATION

A successful model of Public-Private Partnership. (Govt. owned and managed by private sector professionals)

1700 SMEs graduated to a higher level of competitiveness, innovation and profitability

400 export-based SMEs were supported

100 SMEs initiated exports through BSF funded projects

BSF-CORE VALUES

1

- Developing new enterprises

2

- Supporting existing enterprises through Business Development Service Providers (BDSP)

3

- Inculcating business processes/models in developing rural enterprises

Mission Statement

Making SMEs competitive and sustainable through innovation and efficiency

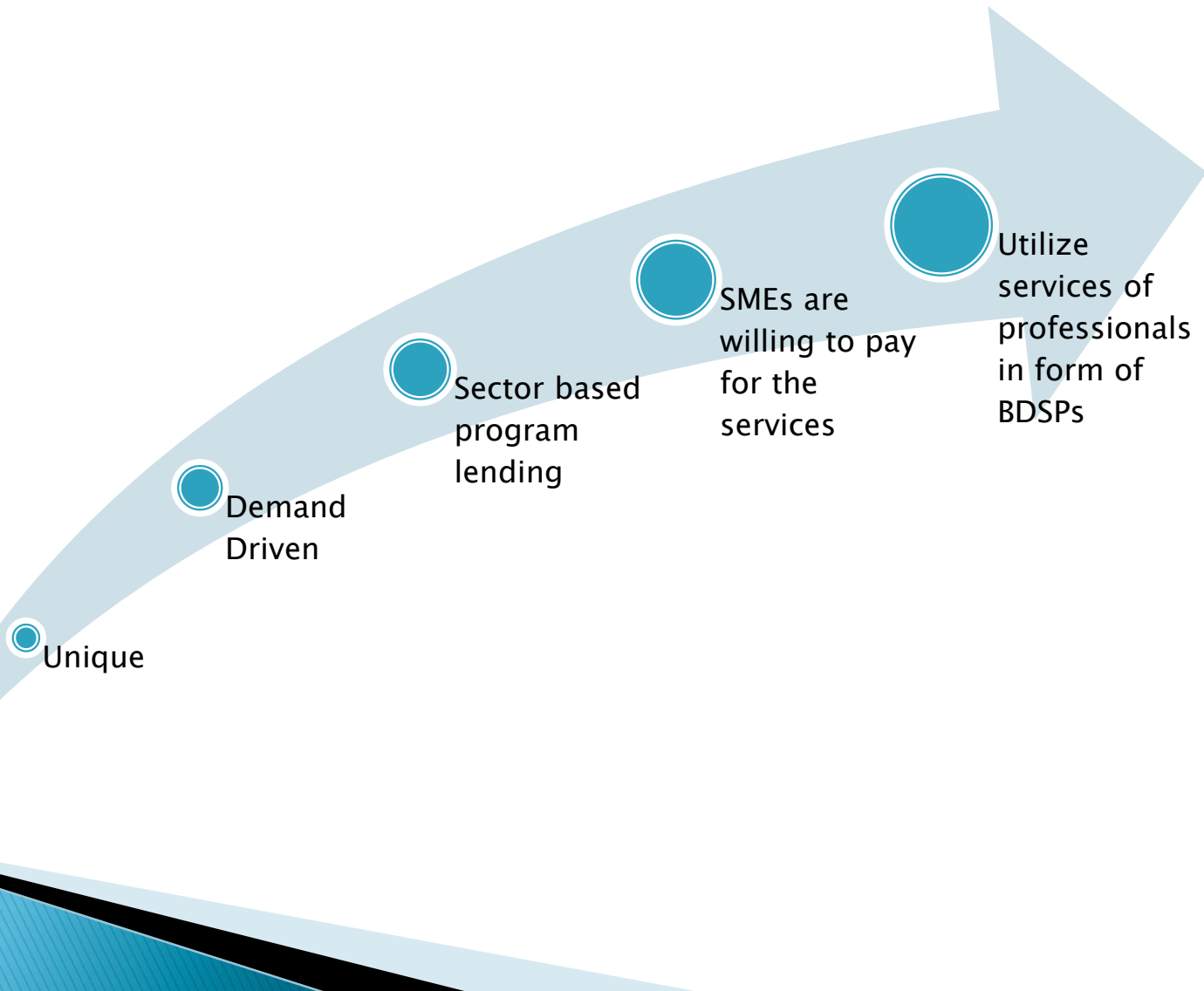


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How BSF programs are different



Business Support Fund



CORE VALUE-PROGRAMS

DEVELOPING NEW ENTERPRISES

- ❖ FRANCHISING PAKISTAN PROGRAM
- ❖ CEL (CENTER FOR ENTREPRENEURSHIP AND LEADERSHIP)
- ❖ PELP (PAKISTAN ENTREPRENEURSHIP AND LEADERSHIP PROGRAM)
- ❖ YELP (YOUNG ENTREPRENEURSHIP AND LEADERSHIP PROGRAM)

CORE VALUES-PROGRAMS

SUPPORTING EXISTING ENTERPRISES

- ❖ BSF SMART BORROWER PROGRAM
- ❖ SME STAFF TRAINING PROGRAM
- ❖ HR PLUS PROGRAM
- ❖ SME DEVELOPMENT CENTER
- ❖ ***BSF SMART ENERGY PROGRAM***

CORE VALUES-PROGRAMS

INCULCATING BUSINESS PROCESSES IN DEVELOPING RURAL ENTERPRISES

- ❖ PEACH, PEACE & PROSPERITY PROGRAM
- ❖ ENTERPRISE DEVELOPMENT CENTER
- ❖ VEGETABLE VALUE CHAIN PROGRAM



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Business Support Fund

SMART Energy Program

A Joint Venture between BSF and
Smart Systems (Pvt) Ltd

BSF SMART ENERGY PROGRAM

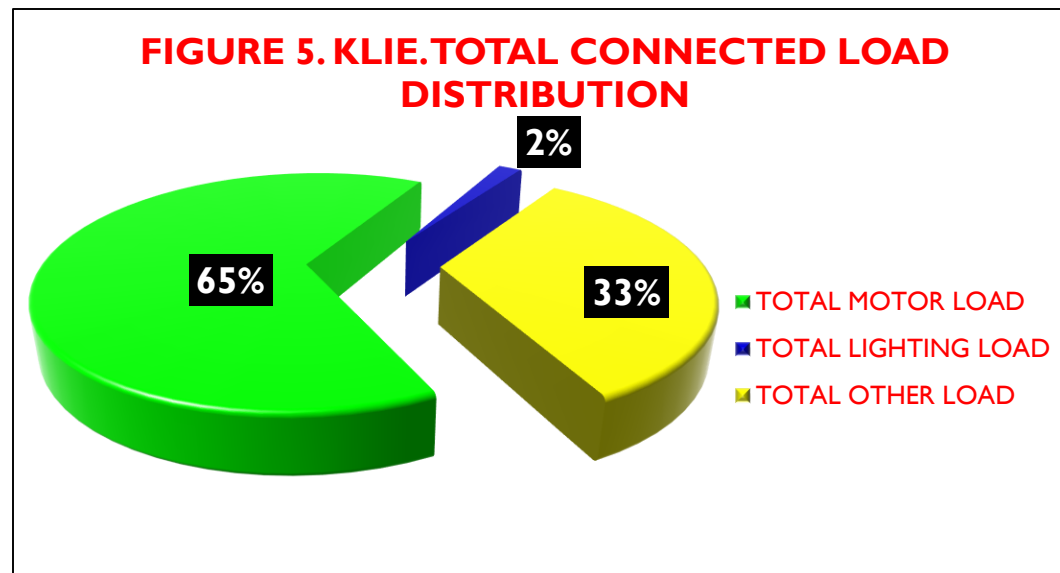
- ▶ BSF Joint Venture with Smart Systems (Smc-Pvt) Ltd (leading Engineering firm) led by an eminent consultant Prof Dr. Zahir Fikri
- ▶ JV formed in February 2011
- ▶ Objective was to carry out research studies on energy efficiency outreach communication and research
- ▶ Development of innovative energy retrofit solutions, which could result in substantial savings in energy consumption and reduction of demand within the SME sector

ENERGY AUDITS

- ▶ Under this JV, Pre Energy Audit was started in March, 2013
- ▶ In six months, JV carried out Pre Energy Audit of 150 SMEs in the Quaid-e-Azam Industrial Estate, Kot Lakhpat which accounts for 46 MV connected load
- ▶ Detailed audits along with Power Factor Correction of 10 SMEs were also carried out to determine actual savings in selected industries.

TOTAL CONNECTED LOAD DISTRIBUTION

TABLE 20. KLIE.TOTAL CONNECTED LOAD DISTRIBUTION			
NO.	TYPE	LOAD (KW)	% OF TOTAL LOAD
1	TOTAL MOTOR LOAD	30206	65
2	TOTAL LIGHTING LOAD	796	2
3	TOTAL OTHER LOAD	15488	33
TOTAL CONNECTED LOAD		46490	100

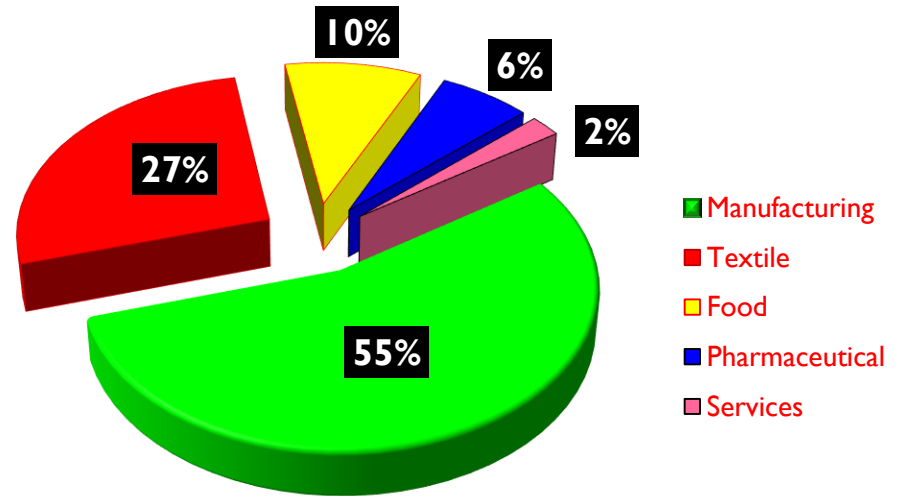


TOTAL MOTOR LOAD/MAIN SECTOR

**TABLE 29. KLIE.TOTAL MOTOR
LOAD/MAIN SECTOR**

NO.	SECTOR	LOAD (KW)	% OF TOTAL MOTOR LOAD
1	Manufacturing	16592	55
2	Textile	8113	27
3	Food	2896	10
4	Pharmaceutical	1947	6
5	Services	658	2
Total		30206	100

**FIGURE 18. KLIE.TOTAL MOTOR LOAD PER
MAIN SECTOR**



MOTORS IN KLIE

- Motor Horse Power Analysis has been shown in the following graph:

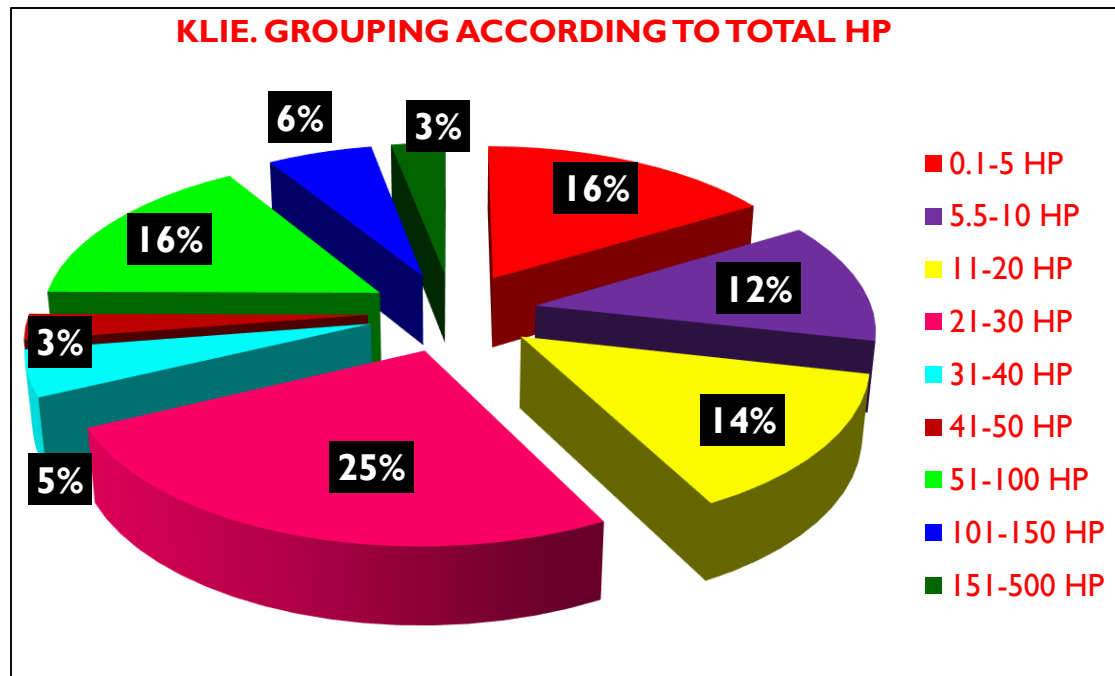
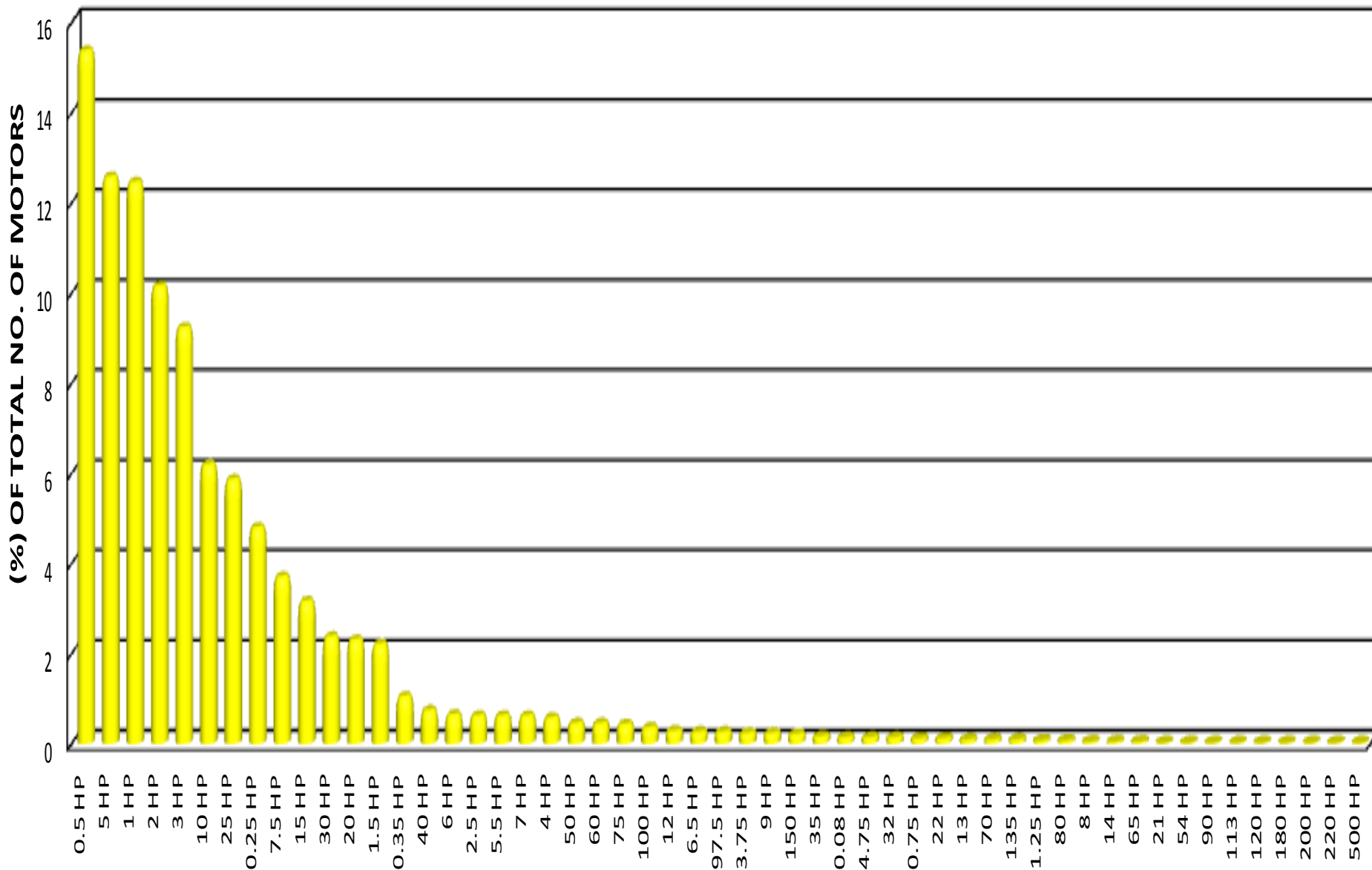


FIGURE 21. KLIE. MOTOR HORSE POWER ANALYSIS

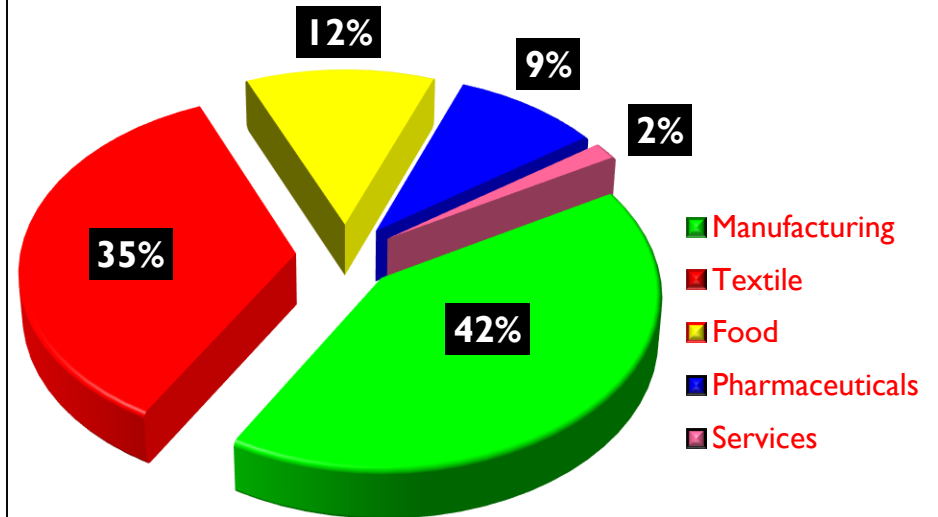


TOTAL LIGHTING LOAD/MAIN SECTOR

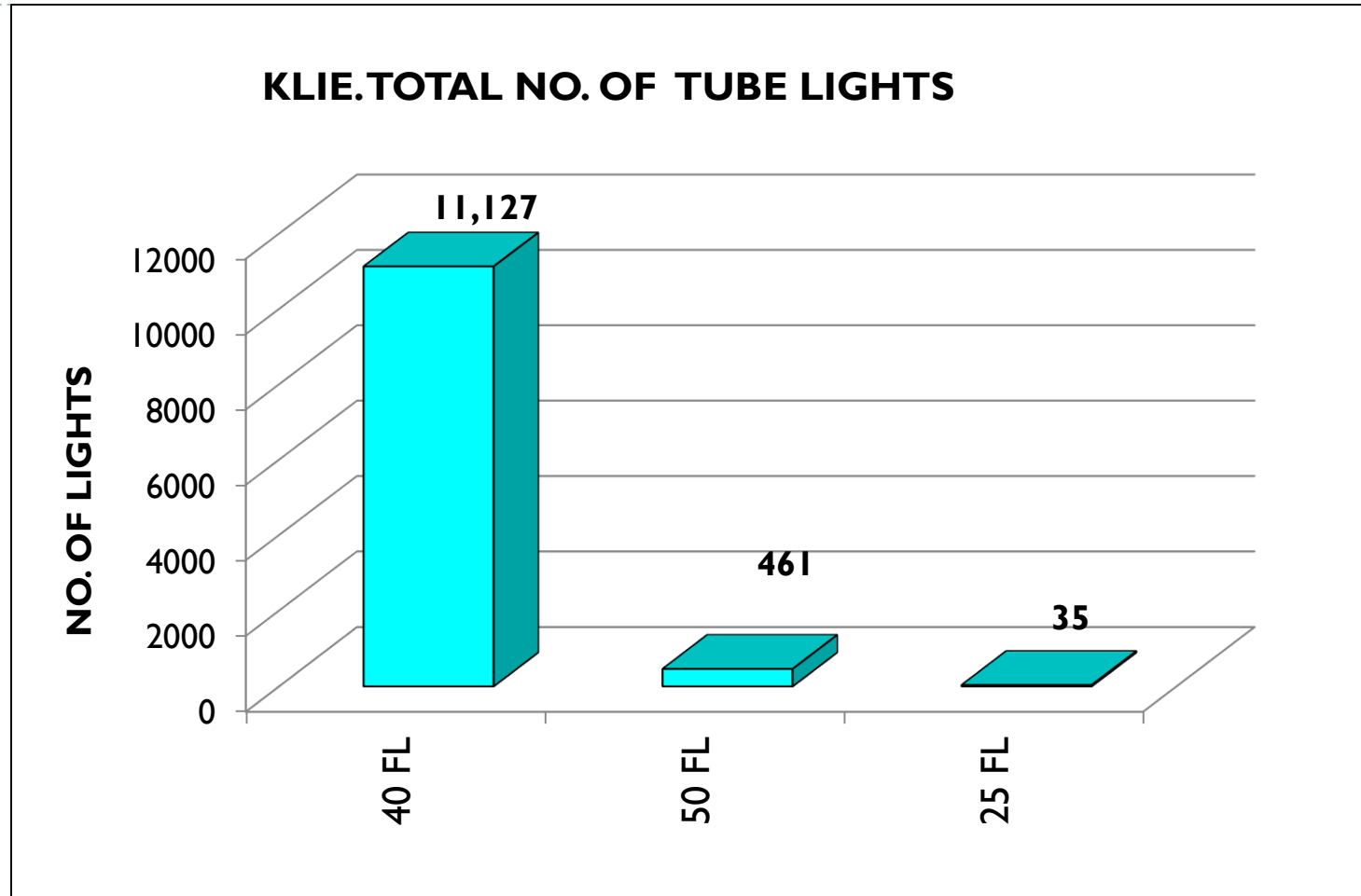
**TABLE 38. KLIE.TOTAL LIGHTING
LOAD/MAIN SECTOR**

NO.	SECTOR	LOAD (KW)	% OF TOTAL LIGHTING LOAD
1	Textile	332	42
2	Manufacturing	281	35
3	Food	96	12
4	Pharmaceutical	75	9
5	Services	12	2
Total		796	100

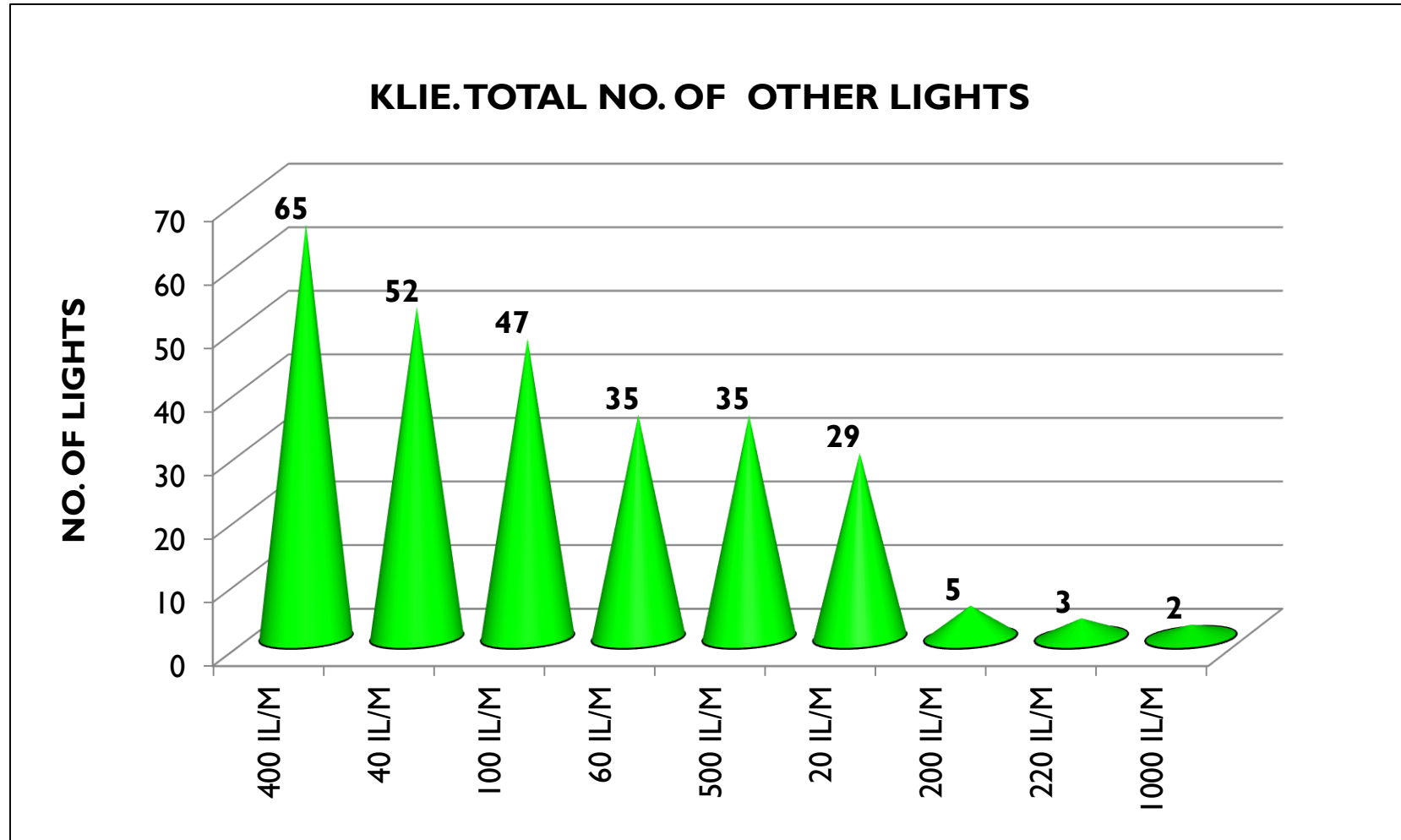
**FIGURE 28. KLIE.TOTAL LIGHTING
LOAD PER MAIN SECTOR**



LIGHTING DISTRIBUTION W.R.T TUBE LIGHTS

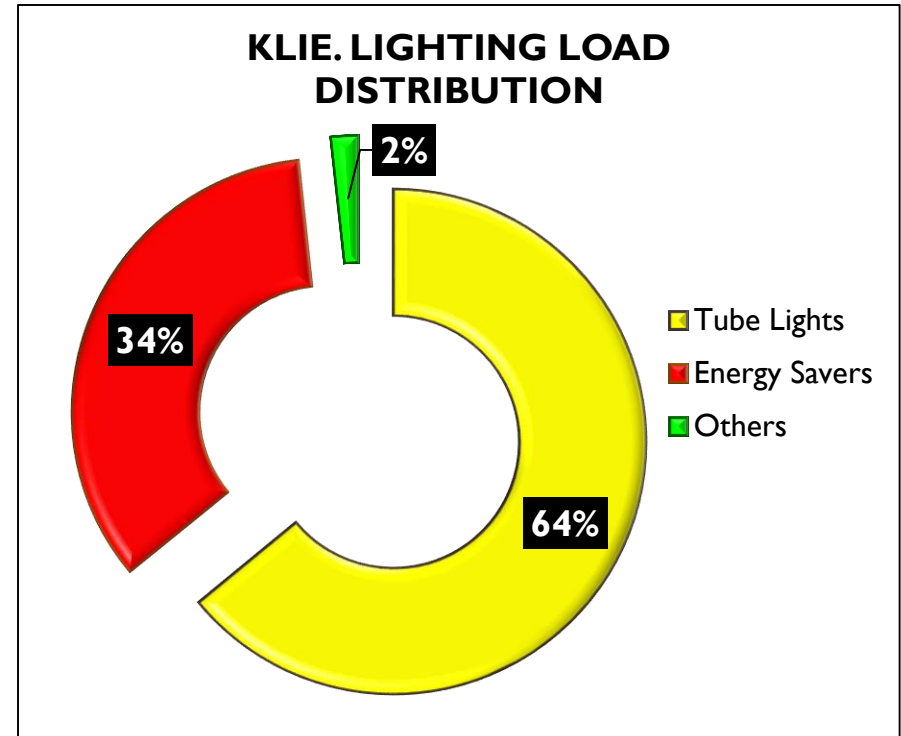


LIGHTING DISTRIBUTION W.R.T OTHER LIGHTS



LIGHTING LOAD DISTRIBUTION

KLIE. LIGHTING LOAD DISTRIBUTION		
TYPE	LOAD (KW)	% OF TOTAL LOAD
Tube Lights	268	64
Energy Savers	470	34
Others	57	2
TOTAL	796	100

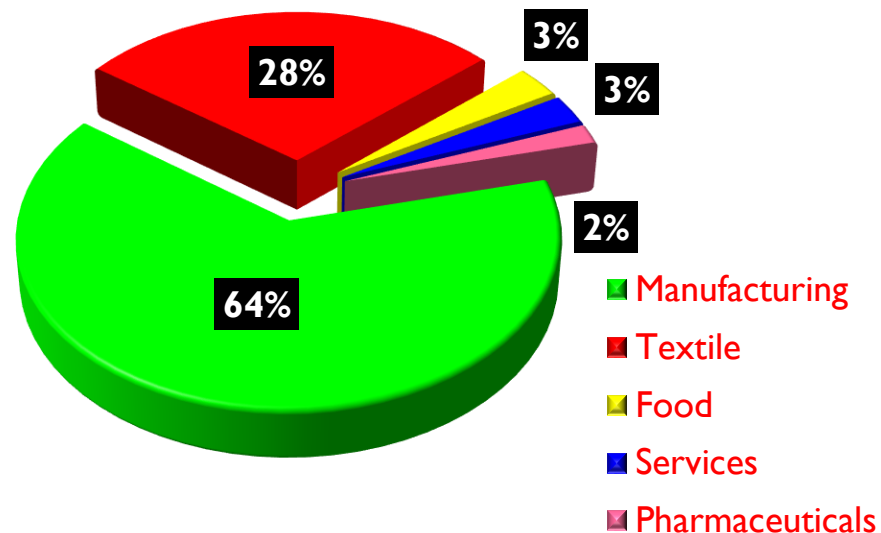


TOTAL OTHER LOAD/MAIN SECTOR

**TABLE 43. KLIE.TOTAL OTHER
LOAD/MAIN SECTOR**

NO.	SECTOR	LOAD (KW)	%TOTAL OTHER LOAD
1	Manufacturing	9926	64
2	Textile	4384	28
3	Food	464	3
4	Pharmaceuticals	430	3
5	Services	284	2
Total		15488	100

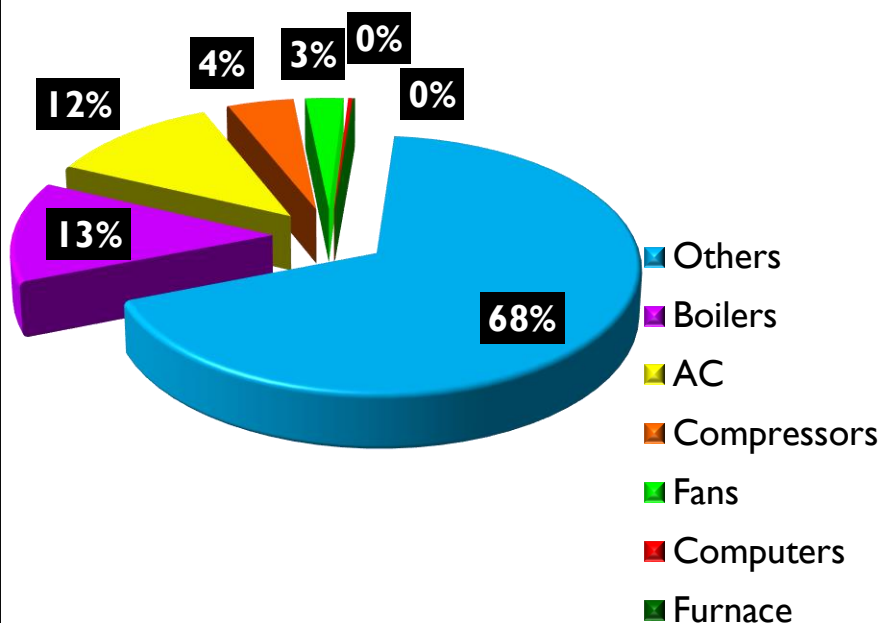
**FIGURE 34. KLIE.TOTAL OTHER
LOAD PER MAIN SECTOR**



KLIE. OTHER LOAD DISTRIBUTION

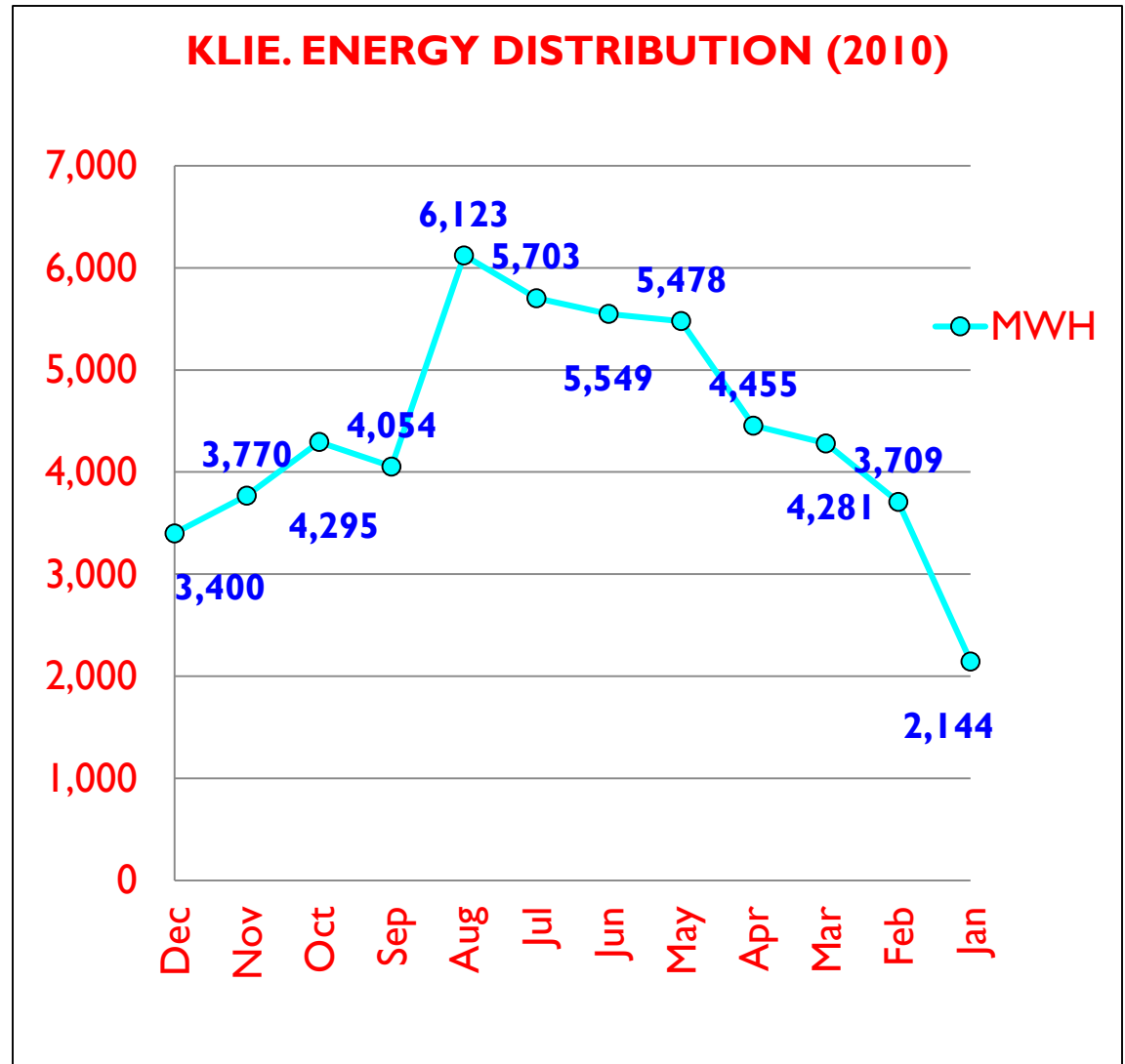
TYPE	KW	% OF TOTAL OTHER LOAD
Others	10487	67.71
Boilers	1992	12.86
AC	1839	11.88
Compressors	706	4.56
Fans	402	2.60
Computers	41	0.27
Furnace	21	0.14
TOTAL	15488	100

KLIE. OTHER LOAD DISTRIBUTION



% ENERGY DISTRIBUTION (2010)

MONTHS	MWH	W.R.T HIGHEST
Dec	3,400	56
Nov	3,770	62
Oct	4,295	70
Sep	4,054	66
Aug	6,123	100
Jul	5,703	93
Jun	5,549	91
May	5,478	89
Apr	4,455	73
Mar	4,281	70
Feb	3,709	61
Jan	2,144	35
Maximum	6,123	100
Minimum	2,144	35
Average	4,414	72
Total	52,962	865



CAPACITOR APPLICATION ON 20 MOTORS IN KLIE

Pilot Test – For SME Operating in the Knitting Sector

STUDY OF DEMAND AND POWER FACTOR OF 135 SMIS IN KLIE

- ▶ Existing power factor of various SMEs in KLIE studied.

TABLE 1. AVERAGE POWER FACTOR OF MAIN SECTORS		
NO.	SECTOR	AVERAGE PF
1	Manufacturing Sector	0.85
2	Textile Sector	0.88
3	Food Sector	0.93
4	Pharmaceutical Sector	0.85
5	Services Sector	0.83
Overall		0.86

CAPACITOR APPLICATION STUDY

- ▶ **Separate study for industrial power factor correction in KLIE Lahore.**
- ▶ **Capacitor installed on 20 motors**
- ▶ **Range of motor size 3.73 KW to 29.84 KW**
- ▶ **Capacitor sizes tested KVAR**
 - ▶ **2.5**
 - ▶ **5**
 - ▶ **10**
 - ▶ **12.5**
 - ▶ **15**
- ▶ **50% to 70% improvement in power factor**
- ▶ **40% reduction in electric current recorded.**



SME Energy Efficiency Outreach, Research and Demonstration Support Services Program

- ▶ BSF assisted by the joint venture partner Smart Systems has developed a PC1 (SME Energy Efficiency Outreach, Research and Demonstration Support Services)
- ▶ Total Outlay of PC 1 is Rs . 8,035 Million (\$81 Million).
- ▶ PC 1 has been submitted to Planning Commission through Ministry of Finance.
- ▶ PC-1 Proposes 30% resource mobilization from local investment banks and 70% from foreign donors.

PC 1 OVERVIEW

- ▶ The project aims at developing an effective outreach, research and demonstration program that makes possible to introduce to the SME's (37,400) both commercially available technologies and new methods.
- ▶ An energy investment fund has been proposed that would provide PKR 2.25 million financing per SME with 50% as grant
- ▶ To achieve sustainability of BSF'S free energy support service, an endowment fund has been proposed
- ▶ The funding for the endowment fund will be obtained from the donors and other NGOs'

PC 1 Overview

- ▶ The overall objectives of this program are:
 - i. Reduction of Power demand
 - ii. Reduction of Energy Consumption
 - iii. Achieving environmental sustainability
 - iv. Reduction of cost of energy
 - v. Introduction of renewable technologies
 - vi. Reducing cost of industrial production
 - vii. Making SMEs competitive for achieving export targets

- ▶ The program components are summarized as under:
 - i. Detailed measurements and design
 - ii. Support programs for retrofits
 - iii. Research and Demonstration programs

PC 1 Overview

- iv. Demonstration Centers
- v. Outreach and communication programs v
- vi. Energy Portals for dissemination of energy efficient solutions
- vii. Research on new technologies
- viii. Online Publications ix. Surveys and market research for energy efficient solutions
- x. Training of energy service companies in energy efficient solutions
- xi. Energy Investment fund
- xii. Energy Endowment fund
- xiii Program implementation unit
- xiv. Infrastructure and facilities

PC 1 Overview

- ▶ Under this PC-1 An energy investment fund of \$22 Million has been proposed that would provide PKR 2.25 million financing per SME with 50% as grant
- ▶ Energy investment fund aims at providing capital investment to the SMEs with part of the investment as grant.
- ▶ Funding for the Energy Investment fund shall be obtained preferably interest free with 50% non-returnable grant from the donors.
- ▶ The target is to provide 50% of the retrofit cost as grant to the SMEs.
- ▶ The retrofits will be offered with 10 year repayment plans of the 50% loan part of the program. Such support programs do not yet exist for the SMEs in Pakistan.

PC 1 Overview

- ▶ Under this PC-1 An energy Endowment fund has also been proposed
- ▶ The objective of the endowment fund is to generate income to cover the cost of free energy support services to the SMEs
- ▶ To meet operating expenses of the operating unit of the program. It is estimated that free energy services can be provided to 500 SMEs per year.

Solution offered in Program

- ▶ The program has focused on a number of solutions which can result in substantial energy reductions.
- ▶ Some of the solutions are:
 - i. Convert lighting to Energy Saver or LED lighting, saving 30 to 50%,
 - ii. Convert motors to high efficiency motors,
 - iii. Use Variable Frequency drives to reduce speed to match with load,
 - iv. Capacitors, saving 30 to 50% of demand,
 - v. Use free cooling and insulation for AC loads saving 60% to 85%,

Solution offered in Program

- vi, Re-engineer your industrial processes, saving 30% to 50%
 - vii. Retrofit and Convert boilers and furnaces saving 20 to 30%
 - viii. Recover 90% of waste heat and use.
-
- ▶ Other solutions may include integrated energy systems maximizing free sources of heating, cooling and light,
 - ▶ Converting the existing electricity based heating and cooling systems to solar based heating and absorption systems etc.
 - ▶ Most of the mentioned technologies are already commercially available.
 - ▶ Some of these including PV cells have become affordable due to the increasing cost of electricity gas and oil.

FEASIBILITY STUDIES

Two studies were carried out in support of PC-1

Lighting Measurement

- Analysis and calculations showed that the present lights being used in the industry are not energy efficient
- The lighting efficiency of the building can be improved considerably.

Fan Measurement

- Analysis and conclusions have shown that the present fans being used in the industry are not energy efficient
- It was concluded after retrofitting the fans, 60–70 % of the energy consumption can be reduced

POWER FACTOR IMPROVEMENT PROGRAM

The project encompasses Punjab, Sindh, KPK & Balochistan

This project will place low tension (LT) capacitors on induction motors of 15,300 selected SME's in Pakistan

This intervention will yield quick measureable results by reducing power demand, energy consumption and energy bills

The implementation time for the project will be five years

The total cost of this component is \$ 66.4 million

The total reduction in demand will be 707 MVA

PROJECT SUMMARY

ITEM	UNIT	COMPONENT				TOTAL
		I	II	III	IV	
No. SMIs	No.	10,000	2,700	2,100	500	15,300
Capacitors	No.	140,000	37,800	29,400	7,000	214,200
Project Cost	\$Mill.	42.3	10.1	8.1	5.9	66.4
Retrofit Cost	\$Mill.	28.2	6.4	4.9	1.9	41.20
IU Cost	\$Mill.	12.3	3.3	2.9	2.9	21.20
FIRR	%	148%	243%	213%	117%	203%
Payback	Yrs	0.67	0.41	0.47	0.85	0.49
BC Ratio	No.	2.29	2.70	2.61	2.42	1.87
Reduction in Demand	MVA	462	125	97	23	707





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Way Forward



Business Support Fund

- ▶ Possibility of Commercial Financing for Energy Efficiency
- ▶ Regular Training Programs for SMEs on in-house energy conservation
- ▶ Promotion of low-cost energy efficiency products e.g. AirconMiser[®], Euro Energy Sheild[®] etc.
- ▶ Registration of BDSPs specializing in energy efficiency for providing services to the SMEs



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Thank you!

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