

Annex IV - Project Stakeholders

1. The Kenya Association of Manufacturers
2. The Kenya Tea Growers Association
3. The Kenya Tea Development Authority
4. The Kenya Sugar Authority
5. The Kenya Association of Hotelkeepers & Caterers
6. The Ministry of Industrial Development
7. The Ministry of Environment and Natural Resources
8. The Ministry of Energy
9. The Ministry of Agriculture and Livestock Development
10. The Kenya Power & Lighting Company
11. The Ministry of Technical Training
12. The Kenya Industrial Research Institute
13. UNDP
14. The World Bank
15. UNEP
16. The Ministry of Finance (Treasury)
17. UNIDO
18. NGOs that are involved in Energy matters e.g. KENGO, CNA etc.
19. Federation of Kenya Employers

Annex V - SME Classification

In this proposal, small and medium scale enterprises are classified as follows:

A. Manufacturing enterprises

Steel and metals

Chemicals and pharmaceuticals (e.g. paint)

Food and agriculture (e.g. tea, coffee, sugar, starch)

Plastics and rubber (e.g. shoes, floor mats, tiles, tire retreading)

Textiles and leather

Pulp and paper

Construction (e.g. bricks, lumber, ceramics, asphalt, kiln ware)

B. Service enterprises (both private and public)

Hotels

Commercial and office buildings

Schools

Hospitals

Annex VI - Audit results of the Kenya Energy Management Programme (KEMP)

During the Kenya Energy Management Programme (KEMP), KAM completed 30 audits in Kenyan industrial enterprises. Each of these included complete audit reports with recommendations for energy efficiency improvements. There was no systematic follow-up (monitoring, evaluation) included in the programme. Nonetheless, KAM has received some feedback, as indicated here.

Of the 30 enterprises in the programme; five enterprises undertook to improve their energy efficiency by implementing cost effective measures as recommended by KAM. The following five enterprises undertook to implement many of the recommended improvements. In each case, KAM was recalled to make further recommendations. These studies are underway on a fees-for-service basis.

Name of enterprise	Energy efficiency investment required Million KSh (Million USD)
Kenya Breweries	20 (0.3)
Highlands Tea Growers	100 (1.6)
Rivertex (textiles)	20 (0.3)
Nayuki Textile	5 (0.1)
Mombasa Towels (textiles)	10 (0.2)

The recommended improvements at the remaining 25 enterprises in the KEMP consisted of “housekeeping” measures which typically required much less than one million KSh at each facility. There was no systematic follow-up and no results have been reported.

Annex VII

Tea 1

Project: Kenya ESCO proposal- Medium scale project

Preliminary audit for a typical case

Sub-sector: Tea **Nominal capacity:** 3600000 kg made tea **Turnover:** 504000 10⁶xKsh

Global figures of factory :

Energy budget(1us\$=60Ksh)	Ksh	Energy consumption:	
Electricity:	9698864	Electricity :	2194313 Kwh or: 189 Toe
Fuel oil:	19227818	Fuel oil:	1099 Tons or: 1099 Toe
Fuel wood:		Fuel wood:	m ³ or : Toe
Total :	28926682	Total :	1287 Toe
Water :		Water :	m ³

Ratio Energy/Production costs: 0.27 Shift/day : 2

Specific consumption :

Electricity :	0.610 Kwh/kg
Fuel oil:	0.275 l/kg
Fuel wood:	0.000 Kg/kg
Water:	0.000 m ³ /kg

Main energy efficiency projects:	applicability	Savings		Investment Ksh	Pay-back Period years
		Ksh	(Toe)		
Automatic peak demand regulator	x	100000	2	100000	1.0
Heat pump					
Lighting low consumption	x	35000	1	21000	0.6
Compressed air leakage					
Venturi compressed air cleaner					
Dessicant air dryer					
Efficient compressor					
Modulating of the compressors					
Make up water heating	x	384556	22	800000	2.1
Recuperation on waste cooling water					
Insulation with local material	x	48070	3	72000	1.5
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air	x	1442086	82	2500000	1.7
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment					
Solid fuel feeding and combustion system	x	8175000	-	10000000	1.2
Wood chips burner					
High eff. motors					
Variable speed drive	x	600000	12	1500000	2.5
Software for the energy management	x	867800	39	900000	1.0
Micro-switch on openings for cond. area					
Steam turbine	x	2601720	51	4800000	1.8
Various other projects	x	1000000	45	1000000	1.0
TOTAL		15154233	253	21593000	1.4

Energy Savings: **0.20**

Electricity	0.34
Fuel oil	0.17
Fuel Wood	0.00
Water	0.00

Tea 2

Preliminary audit for a typical case

Sub-sector: Tea Nominal capacity: **3600000 kg made tea** Turnover: **504000 10%Ksh**

Global figures of factory :**Energy budget(1us\$=60Ksh)**

Electricity: 9698864
 Fuel oil: 11053188
 Total : 20752052
 Water :

Ksh**Energy consumption:**

Electricity : 2194313 Kwh or: 189 Toe
 Fuel oil: Tons or: 0 Toe
 Fuel wood: 13816 m³ or : 2570 Toe
 Total : 2759 Toe
 Water : m³

Ratio Energy/Production costs: 0.17 Shift/day : 2

Specific consumption :

Electricity : 0.610 Kwh/kg
 Fuel oil: 0.000 l/kg
 Fuel wood: 0.004 m³/kg
 Water: 0.000 m³/kg

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period years
		Ksh	(Toe)	Ksh	
Automatic peak demand regulator	x	100000	2	100000	1.0
Heat pump					
Lighting low consumption	x	35000	1	21000	0.6
Compressed air leakage					
Venturi compressed air cleaner					
Dessicant air dryer					
Efficient compressor					
Modulating of the compressors					
Make up water heating	x	384556	51	800000	2.1
Recuperation on waste cooling water					
Insulation with local material	x	48070	6	72000	1.5
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air	x	1442086	193	2500000	1.7
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment					
Solid fuel feeding and combustion system	x	2763297	643	10000000	3.6
Wood chips burner					
High eff. motors					
Variable speed drive	x	600000	12	1500000	2.5
Software for the energy management	x	867800	115	900000	1.0
Micro-switch on openings for cond. area					
Steam turbine	x	2601720	51	4800000	1.8
Various other projects	x	1000000	133	1000000	1.0
TOTAL		9742529	1204	21593000	2.2

Energy Savings:

0.44
 Electricity 0.34
 Fuel oil 0.00
 Fuel 0.44
 Wood
 Water 0.00

Tea 3

Project: Kenya ESCO proposal - Small scale project**Preliminary audit for a typical case**

Sub-sector: Tea	Nominal capacity:	3600000 kg made tea	Turnover:	504000 10%Ksh
Global figures of factory :				
Energy budget(1us\$=60Ksh)	Ksh	Energy consumption:		
Electricity:	9698864	Electricity :	2194313 Kwh or:	189 Toe
Fuel oil:	19227818	Fuel oil:	1099 Tons or:	1099 Toe
Fuel wood:		Fuel wood:	m ³ or :	Toe
Total :	28926682		Total :	1287 Toe
Water :		Water :	m ³	
Ratio Energy/Production costs:	0.27 Shift/day :	2		
Specific consumption :				
Electricity :	0.610 Kwh/kg			
Fuel oil:	0.275 l/kg			
Fuel wood:	0.000 Kg/kg			
Water:	0.000 m ³ /kg			

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)	Ksh	years
Automatic peak demand regulator	x	100000	2	100000	1.0
Heat pump					
Lighting low consumption	x	35000	1	21000	0.6
Compressed air leakage					
Venturi compressed air cleaner					
Dessicant air dryer					
Efficient compressor					
Modulating of the compressors					
Make up water heating					
Recuperation on waste cooling water					
Insulation with local material	x	48070	3	72000	1.5
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air	x	1442086	82	2500000	1.7
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment					
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive					
Software for the energy management	x	867800	39	900000	1.0
Micro-swich on openings for cond. area					
Steam turbine					
Various other projects	x	500000	22	500000	1.0
TOTAL		2892956	147	3993000	1.4

Energy Savings:	0.11
Electricity	0.01
Fuel oil	0.13
Fuel	0.00
Wood	
Water	0.00

Paper 1

Project:Kenya ESCO proposal- Medium scale project**Preliminary audit for a typical case**

Sub-sector:	paper and paperbord	Nominal capacity:	Tons	Turnover:	405000 10%Ksh
Global figures of factory :					
Energy budget(1us\$=60Ksh)		Ksh	Energy consumption:		
Electricity:	45405132		Electricity :	10272654 Kwh or:	883 Toe
Fuel oil:	32526315		Fuel oil:	1859 Tons or:	1859 Toe
Fuel wood:			Fuel wood:	m ³ or :	Toe
Total :	77931447			Total :	2742 Toe
Water :			Water :	m ³	
Ratio Energy/Production costs:		0.25 Shift/day :	2		

Specific consumption :

Electricity :	N/A	Kwh/kg
Fuel oil:	N/A	l/kg
Fuel wood:	N/A	Kg/kg
Water:	N/A	m ³ /kg

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)	Ksh	years
Automatic peak demand regulator	x	500000	10	350000	0.7
Heat pump					
Lighting low consumption	x	140000	3	85000	0.6
Compressed air leakage	x	130000	3	40000	0.3
Venturi compressed air cleaner					
Dessicant air dryer	x	45000	1	120000	2.7
Efficient compressor	x	150000	3	800000	5.3
Modulating of the compressors					
Make up water heating	x	650526	37	800000	1.2
Recuperation on waste cooling water					
Insulation with local material	x	81316	5	120000	1.5
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air	x	1463684	84	2250000	1.5
Recuperation on burnt gas					
Flash tank for LP steam production	x	325263	19	1250000	3.8
Bore hole water treatment	x	8922	-	50400	5.6
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive	x	600000	12	1500000	2.5
Software for the energy management	x	2337943	82	900000	0.4
Micro-switch on openings for cond. area					
Steam turbine	x	2601720	51	4800000	1.8
Various other projects	x	1000000	35	1000000	1.0
TOTAL		9534374	333	13715400	1.4

Energy Savings:	0.12
Electricity	0.09
Fuel oil	0.14
Fuel	0.00
Wood	
Water	0.00

Project:Kenya ESCO proposal- Medium scale project**Preliminary audit for a typical case****Sub-sector: paper and paperbord Nominal capacity: Tons Turnover: 405000 10³xKsh****Global figures of factory :****Energy budget(1us\$=60Ksh)**

	Ksh
Electricity:	45405132
Fuel oil:	
Fuel wood:	18652792
Total :	64057924
Water :	

Energy consumption:

Electricity :	10272654 Kwh or:	883 Toe
Fuel oil:	Tons or:	Toe
Fuel wood:	23316 m ³ or :	4337 Toe
Total :	Total :	5220 Toe
Water :	m ³	

Ratio Energy/Production costs: 0.21 Shift/day : 2**Specific consumption :**

Electricity :	N/A	Kwh/kg
Fuel oil:	N/A	l/kg
Fuel wood:	N/A	m ³ /kg
Water:	N/A	m ³ /kg

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)		
Automatic peak demand regulator	x	500000	10	350000	0.7
Heat pump					
Lighting low consumption	x	140000	3	85000	0.6
Compressed air leakage	x	130000	3	40000	0.3
Venturi compressed air cleaner					
Dessicant air dryer	x	45000	1	120000	2.7
Efficient compressor	x	150000	3	800000	5.3
Modulating of the compressors					
Make up water heating	x	650526	87	800000	1.2
Recuperation on waste cooling water					
Insulation with local material	x	81316	11	120000	1.5
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air	x	1463684	195	2250000	1.5
Recuperation on burnt gas					
Flash tank for LP steam production	x	325263	43	1250000	3.8
Bore hole water treatment	x	8922	-	50400	5.6
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive	x	600000	12	1500000	2.5
Software for the energy management	x	1921738	157	900000	0.5
Micro-switch on openings for cond. area					
Steam turbine	x	2601720	51	4800000	1.8
Various other projects	x	1000000	81	1000000	1.0
TOTAL		9118169	646	13715400	1.5

Energy Savings:

	0.12
Electricity	0.09
Fuel oil	0.00
Fuel Wood	0.13
Water	0.00

Project:Kenya ESCO proposal- Small scale project**Preliminary audit for a typical case**

Sub-sector: paper and paperbord **Nominal capacity:** **Tons** **Turnover:** 405000 10³Ksh

Global figures of factory :**Energy budget(1us\$=60Ksh)**

Electricity:	45405132	Ksh
Fuel oil:	32526315	
Fuel wood:		
Total :	77931447	
Water :		

Energy consumption:

Electricity :	10272654 Kwh or:	883 Toe
Fuel oil:	1859 Tons or:	1859 Toe
Fuel wood:	m ³ or :	Toe
Total :		2742 Toe
Water :	m ³	

Ratio Energy/Production costs: **0.25 Shift/day :** **2**

Specific consumption :

Electricity :	N/A	Kwh/kg
Fuel oil:	N/A	l/kg
Fuel wood:	N/A	Kg/kg
Water:	N/A	m ³ /kg

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)	Ksh	years
Automatic peak demand regulator	x	500000	10	350000	0.7
Heat pump					
Lighting low consumption	x	140000	3	85000	0.6
Compressed air leakage	x	130000	3	40000	0.3
Venturi compressed air cleaner					
Dessicant air dryer	x	45000	1	120000	2.7
Efficient compressor					
Modulating of the compressors					
Make up water heating	x	650526	37	800000	1.2
Recuperation on waste cooling water					
Insulation with local material	x	81316	5	120000	1.5
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air	x	1463684	84	2250000	1.5
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment			-		
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive					
Software for the energy management	x	2337943	82	900000	0.4
Micro-switch on openings for cond. area					
Steam turbine					
Various other projects	x	500000	18	500000	1.0
TOTAL		5348470	231	4815000	0.9

Energy Savings:

	0.08
Electricity	0.02
Fuel oil	0.12
Fuel Wood	0.00
Water	0.00

Textile 1

Project: Kenya ESCO proposal- Medium scale project**Preliminary audit for a typical case**

Sub-sector: Textile	Nominal capacity:	5000000 m²	Turnover:	746000 10%Ksh
Global figures of factory :				
Energy budget(1us\$=60Ksh)	Ksh	Energy consumption:		
Electricity:	19594477	Electricity :	4433140 Kwh or:	381 Toe
Fuel oil:	26343750	Fuel oil:	1505 Tons or:	1505 Toe
Fuel wood:		Fuel wood:	m ³ or :	Toe
Total :	45938227		Total :	1887 Toe
Water :		Water :	m ³	
Ratio Energy/Production costs:	0.08 Shift/day :	2		

Specific consumption :

Electricity :	0.887 Kwh/m ²
Fuel oil:	0.271 l/m ²
Fuel wood:	0.000 Kg/m ²
Water:	0.000 m ³ /m ²

Main energy efficiency projects:	applicability	Savings		Investment Ksh	Pay-back Period years
		Ksh	(Toe)		
Automatic peak demand regulator	x	1200000	23	1600000	1.3
Heat pump					
Lighting low consumption	x	100000	2	180000	1.8
Compressed air leakage	x	500000	10	40000	0.1
Venturi compressed air cleaner	x	150000	3	170000	1.1
Dessicant air dryer	x	45000	1	120000	2.7
Efficient compressor	x	150000	3	800000	5.3
Modulating of the compressors					
Make up water heating	x	526875	30	750000	1.4
Recuperation on waste cooling water	x	2107500	120	6500000	3.1
Insulation with local material	x	65859	4	90000	1.4
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air					
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment	x	9634	-	50000	5.2
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive	x	600000	12	1500000	2.5
Software for the energy management	x	1378147	57	900000	0.7
Micro-switch on openings for cond. area					
Steam turbine	x	1734480	34	4000000	2.3
Various other projects	x	1000000	41	1000000	1.0
TOTAL		8367495	316	16100000	1.9

Energy Savings:

	0.17
Electricity	0.23
Fuel oil	0.15
Fuel	0.00
Wood	
Water	0.00

Textile 2

Project:Kenya ESCO proposal- Medium scale project**Preliminary audit for a typical case**

Sub-sector: Textile **Nominal capacity: 5000000 m²** **Turnover: 746000 10⁸Ksh**

Global figures of factory :**Energy budget(1us\$=60Ksh)**

Ksh
Electricity: 19594477
Fuel oil: 26343750
Fuel wood:
Total : 45938227
Water :

Energy consumption:

Electricity : 4433140 Kwh or: 381 Toe
Fuel oil: 1505 Tons or: 1505 Toe
Fuel wood: m³or : Toe
Total : 1887 Toe
Water : m³

Ratio Energy/Production costs: 0.08 Shift/day : 2

Specific consumption :

Electricity : 0.887 Kwh/m²
Fuel oil: 0.271 l/m²
Fuel wood: 0.000 Kg/m²
Water: 0.000 m³/m²

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)	Ksh	years
Automatic peak demand regulator	x	1200000	23	1600000	1.3
Heat pump					
Lighting low consumption	x	100000	2	180000	1.8
Compressed air leakage	x	500000	10	40000	0.1
Venturi compressed air cleaner	x	150000	3	170000	1.1
Dessicant air dryer	x	45000	1	120000	2.7
Efficient compressor	x	150000	3	800000	5.3
Modulating of the compressors					
Make up water heating	x	526875	30	750000	1.4
Recuperation on waste cooling water	x	2107500	120	6500000	3.1
Insulation with local material	x	65859	4	90000	1.4
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air					
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment	x	9634	-	50000	5.2
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive	x	600000	12	1500000	2.5
Software for the energy management	x	1378147	57	900000	0.7
Micro-switch on openings for cond. area					
Steam turbine					
Various other projects	x	1000000	41	1000000	1.0
TOTAL		6633015	282	12100000	1.8

Energy Savings:

0.15
Electricity 0.14
Fuel oil 0.15
Fuel Wood 0.00
Water 0.00

Textile 3

Project:Kenya ESCO proposal- Small scale project**Preliminary audit for a typical case**

Sub-sector: Textile **Nominal capacity: 5000000 m²** **Turnover: 746000 10⁸Ksh**

Global figures of factory :**Energy budget(1us\$=60Ksh)**

	Ksh
Electricity:	19594477
Fuel oil:	26343750
Fuel wood:	
Total :	45938227
Water :	

Energy consumption:

Electricity :	4433140 Kwh or:	381 Toe
Fuel oil:	1505 Tons or:	1505 Toe
Fuel wood:	m ³ or :	Toe
Total :	Total :	1887 Toe
Water :	m ³	

Ratio Energy/Production costs: 0.08 Shift/day : 2

Specific consumption :

Electricity :	0.887 Kwh/m ²
Fuel oil:	0.271 l/m ²
Fuel wood:	0.000 Kg/m ²
Water:	0.000 m ³ /m ²

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)	Ksh	years
Automatic peak demand regulator	x	1200000	23	1600000	1.3
Heat pump					
	x	100000	2	180000	1.8
Compressed air leakage	x	500000	10	40000	0.1
Venturi compressed air cleaner	x	150000	3	170000	1.1
Dessicant air dryer					
Efficient compressor					
Modulating of the compressors					
Make up water heating	x	526875	30	750000	1.4
Recuperation on waste cooling water					
Insulation with local material	x	65859	4	90000	1.4
Water recuperation for prewash					
Flow limitation device					
Recuperation on waste hot air					
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment	x	9634	-	50000	5.2
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive	x	600000	12	1500000	2.5
Software for the energy management	x	1378147	57	900000	0.7
Micro-switch on openings for cond. area					
Steam turbine					
Various other projects	x	500000	21	500000	1.0
TOTAL		3830515	137	4180000	1.1

Energy Savings:

	0.07
Electricity	0.13
Fuel oil	0.06
Fuel Wood	0.00
Water	0.00

Food 1

Project:Kenya ESCO proposal- Medium scale project**Preliminary audit for a typical case**

Sub-sector: Food processing Nominal capacity: Tons Turnover: 207000 10³xKsh

Global figures of factory :**Energy budget(1us\$=60Ksh)**

Electricity:	8250306
Fuel oil:	7710526
Fuel wood:	
Total :	15960832
Water :	

Energy consumption:

Electricity :	1866585 Kwh or:	161 Toe
Fuel oil:	441 Tons or:	441 Toe
Fuel wood:	m ³ or :	Toe
Total :	Total :	601 Toe
Water :	m ³	

Ratio Energy/Production costs: 0.10 Shift/day : 2

Specific consumption :

Electricity :	N/A	Kwh/kg
Fuel oil:	N/A	l/kg
Fuel wood:	N/A	Kg/kg
Water:	N/A	m ³ /kg

Main energy efficiency projects:	applicability	Savings		Investment Ksh	Pay-back Period years
		Ksh	(Toe)		
Automatic peak demand regulator	x	200000	4	140000	0.7
Heat pump					
Lighting low consumption	x	70000	1	45000	0.6
Compressed air leakage	x	130000	3	40000	0.3
Venturi compressed air cleaner					
Dessicant air dryer	x	45000	1	120000	2.7
Efficient compressor	x	150000	3	800000	5.3
Modulating of the compressors					
Make up water heating	x	154211	9	252000	1.6
Recuperation on waste cooling water	x	616842	35	2000000	3.2
Insulation with local material	x	19276	1	32000	1.7
Water recuperation for prewash	x	38553	2	80000	2.1
Flow limitation device					
Recuperation on waste hot air					
Recuperation on burnt gas					
Flash tank for LP steam production	x	77105	4	250000	3.2
Bore hole water treatment	x	2820	-	10000	3.5
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive	x	600000	12	1500000	2.5
Software for the energy management	x	478825	18	900000	1.9
Micro-swich on openings for cond. area					
Steam turbine	x	1734480	34	4000000	2.3
VARIOUS other projects	x	1000000	38	1000000	1.0
TOTAL		5117112	161	11029000	2.2

Energy Savings:

	0.27
Electricity	0.36
Fuel oil	0.24
Fuel	0.00
Wood	
Water	0.00

Food 2

Project:Kenya ESCO proposal- Small scale project**Preliminary audit for a typical case**

Sub-sector:	Food processing	Nominal capacity:	Tons	Turnover:	207000 10³xKsh
Global figures of factory :					
Energy budget(1us\$=60Ksh)		Ksh	Energy consumption:		
Electricity:	8250306		Electricity :	1866585 Kwh or:	161 Toe
Fuel oil:	7710526		Fuel oil:	441 Tons or:	441 Toe
Fuel wood:			Fuel wood:	m ³ or :	Toe
Total :	15960832			Total :	601 Toe
Water :			Water :	m ³	
Ratio Energy/Production costs:		0.10 Shift/day :	2		

Specific consumption :

Electricity :	N/A	Kwh/kg
Fuel oil:	N/A	l/kg
Fuel wood:	N/A	Kg/kg
Water:	N/A	m ³ /kg

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)	Ksh	years
Automatic peak demand regulator	x	200000	4	140000	0.7
Heat pump					
Lighting low consumption	x	70000	1	45000	0.6
Compressed air leakage	x	130000	3	40000	0.3
Venturi compressed air cleaner					
Dessicant air dryer	x	45000	1	120000	2.7
Efficient compressor					
Modulating of the compressors					
Make up water heating	x	154211	9	252000	1.6
Recuperation on waste cooling water					
Insulation with local material	x	19276	1	32000	1.7
Water recuperation for prewash	x	38553	2	80000	2.1
Flow limitation device					
Recuperation on waste hot air					
Recuperation on burnt gas					
Flash tank for LP steam production	x	77105	4	250000	3.2
Bore hole water treatment	x	2820	-	10000	3.5
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive					
Software for the energy management	x	478825	18	900000	1.9
Micro-switch on openings for cond. area					
Steam turbine					
Various other projects	x	1000000	38	1000000	1.0
TOTAL		2015790	77	2729000	1.4

Energy Savings:	0.13
Electricity	0.05
Fuel oil	0.16
Fuel Wood	0.00
Water	0.00

Hotel 1

Project:Kenya ESCO proposal- Medium scale project**Preliminary audit for a typical case****Sub-sector: Hotel****Nominal capacity:****100 beds****Turnover:****75336 10³xKsh****Global figures of factory :****Energy budget(1us\$=60Ksh)****Ksh****Energy consumption:**

Electricity:	1795508	Electricity :	406224 Kwh or:	35 Toe
Fuel oil:	428474	Fuel oil:	24 Tons or:	24 Toe
Fuel wood:		Fuel wood:	m ³ or :	Toe
Total :	2223982	Total :		59 Toe
Water :		Water :	m ³	

Ratio Energy/Total costs:**0.04****Specific consumption :**

Electricity :	25.88 Kwh/bednight
Fuel oil:	1.404 l/bednight
Fuel wood:	0.000 Kg/bednight
Water:	0.000 m ³ /bednight

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)		
Automatic peak demand regulator	x	269326	5	600000	2.2
Heat pump	x	258553	5	1500000	5.8
Lighting low consumption	x	44888	1	240000	5.3
Compressed air leakage					
Venturi compressed air cleaner					
Dessicant air dryer					
Efficient compressor					
Modulating of the compressors					
Make up water heating					
Recuperation on waste cooling water					
Insulation with local material					
Water recuperation for prewash					
Flow limitation device	x	1200000	-	1200000	1.0
Recuperation on waste hot air					
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment					
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive					
Software for the energy management	x	222398	6	600000	2.7
Micro-switch on openings for cond. area	x	22240	0	100000	4.5
Steam turbine					
Various other projects	x	100000	3	100000	1.0
TOTAL		1848079	20	3740000	2.0

Energy Savings:**0.34**

Electricity	0.33
Fuel oil	0.35
Fuel Wood	
Water	0.00

Hotel 2

Project:Kenya ESCO proposal- Small scale project**Preliminary audit for a typical case**

Sub-sector: **Hotel** **Nominal capacity:** **100 beds** **Turnover:** **75336 10³xKsh**

Global figures of factory :**Energy budget(1us\$=60Ksh)**

Ksh	Energy consumption:
Electricity:	1795508
Fuel oil:	428474
Fuel wood:	
Total :	2223982
Water :	

Electricity :	406224 Kwh or:	35 Toe
Fuel oil:	24 Tons or:	24 Toe
Fuel wood:	m ³ or :	Toe
Total :		59 Toe
Water :	m ³	

Ratio Energy/Total costs: 0.02

Specific consumption :

Electricity :	25.88 Kwh/bednight
Fuel oil:	1.404 l/bednight
Fuel wood:	0.000 Kg/bednight
Water:	0.000 m ³ /bednight

Main energy efficiency projects:	applicability	Savings		Investment	Pay-back Period
		Ksh	(Toe)	Ksh	years
Automatic peak demand regulator	x	269326	5	600000	2.2
Heat pump					
Lighting low consumption	x	44888	1	240000	5.3
Compressed air leakage					
Venturi compressed air cleaner					
Dessicant air dryer					
Efficient compressor					
Modulating of the compressors					
Make up water heating					
Recuperation on waste cooling water					
Insulation with local material					
Water recuperation for prewash					
Flow limitation device	x	1200000	-	1200000	1.0
Recuperation on waste hot air					
Recuperation on burnt gas					
Flash tank for LP steam production					
Bore hole water treatment					
Solid fuel feeding and combustion system					
Wood chips burner					
High eff. motors					
Variable speed drive					
Software for the energy management					
Micro-switch on openings for cond. area	x	80000	2	120000	1.5
Steam turbine					
Various other projects	x	100000	3	100000	1.0
TOTAL		1424888	10	1660000	1.2

Energy Savings:

	0.17
Electricity	0.22
Fuel oil	0.11
Fuel	0.00
Wood	
Water	0.00

