

# Fuel Substitution - Poverty Impacts on Biomass Fuel Suppliers

## Uganda Fuel Supplies and Household Energy Provision

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DfID Knowledge and Research

# Uganda Energy Mix

A Study on Urban Households Show Different Levels of Energy Mixes across 4 different income categories

	Income category (Million Shillings)			
	<0.1	0.1-05	0.5-1.0	1.0+
Electricity	5,633	12,259	33,707	42,850
Charcoal	7,833	10,813	17,180	13,343
LPG	-	10,000	4,667	-
Candle	600	1,135	1,340	1,939
Firewood	1,000	4,200	7,667	-
Paraffin	3,166	8,176	7,584	5,029
Average monthly				
Total expenditure	14,033	26,120	55,297	55,704
Std deviation	6,806	20,277	33,415	32,956
Kurtosis	-1.06	2	4	

# Household Energy Overview

- Based on the National Energy Balance Firewood is the main source of H/h energy
- Charcoal doubles up as the main Urban energy source
- LPG use is largely insignificant

## Penetration Rate of H/hold fuels

Tons of Oil Equivalents (TOE)											
	Fuelwood	Charcoal	Residues	Gasoline	AV Gas	Kerosene	Diesel	Fuel oil	LPG	Electricity	
TOTAL CONSUMPTION	5347331	316415	432838	156833	39754	50246	151501	38191	1318	60363	
% All secondary Energy	81.1	4.8	6.6	2.4	0.6	0.8	2.3	0.6	0.0	0.9	
BIOMASS	92.4	Energy Consumption per capita (kgOE):				315.1					
OIL PRODUCTS	6.6	Commercial Energy Cons. per capita (kgOE):				23.8					
ELECTRICITY	0.9										
TOTAL	100.0										

## Market size and Characteristics

- Per capita Consumption

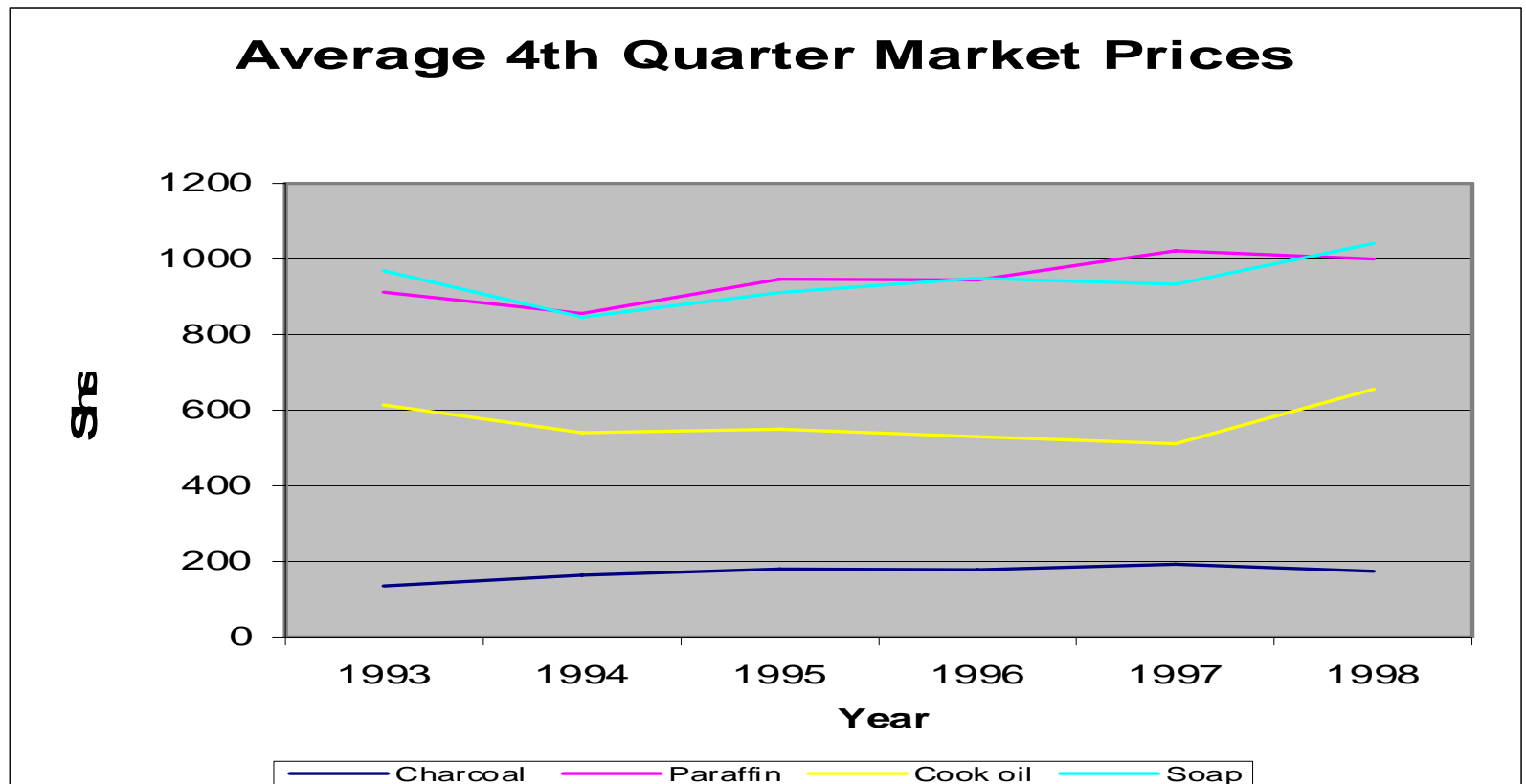
F/wd 218 Kg per capita per annum, Charcoal 2.45 Kg per H/h – “sigiri” , ICS 1.725 Kg per H/h. Annual Per capita 156.7 Kg

### Travel to pick fuel

	Income category (million Shillings)			
	<0.1	0.1-05	0.5-1.0	1.0+
Av. distance to source (km)	1.5	2.4	4.8	6.8
Quantities purchased (sacs/Mth)	0.61	1	1.4	1.6
H/hold expenditure on charcoal	5,767	7,698	10,722	13,100

## Price per Kg

The price of charcoal had remained stagnant over the past 7 years, with seasonal shifts — currently 15,000/= a bag normal price 8000 Bag = 50Kgs

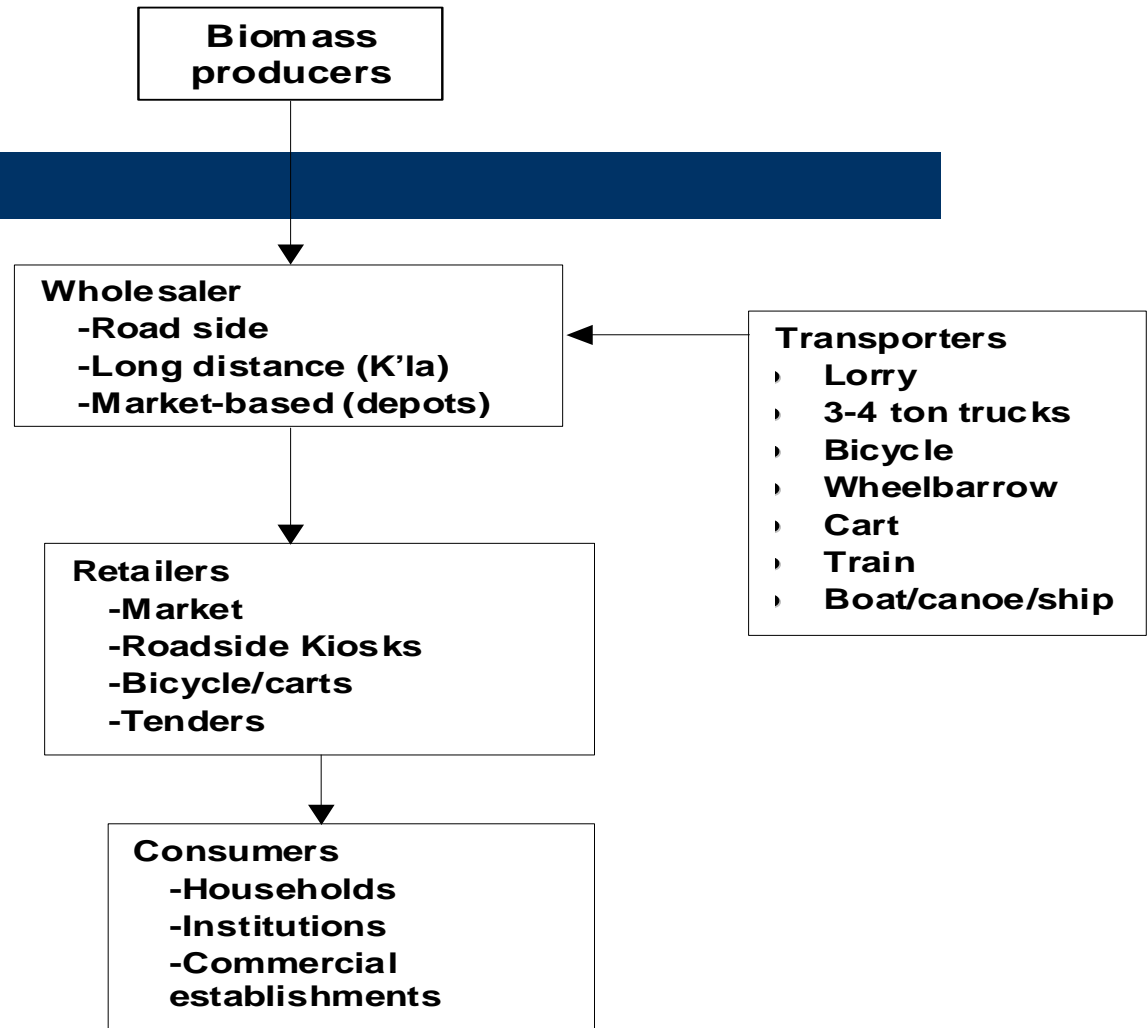


# Comparative costs

The cost of the alternatives to charcoal that is: electricity (old tariff), electricity (new tariff), Kerosene and LPG is 1.5, 2.8, 3.1 and 3.2 times higher than the cost of equivalent amounts of charcoal energy respectively.

<b>Electricity coefficients</b>		<b>Shs unit</b>	<b>Shillings</b>
Charcoal Cost per Tonne	160,000	8000/bag	160,000
Electricity equivalents (kW per T Charcoal) <i>(old tariff)</i>	2404	100/KWh	240,400
Electricity equivalents (kW per T Charcoal) <i>(new tariff 01/06/01)</i>	2404	189/KWh	454,356
Kerosene equivalents (L per T Charcoal)	412	1200/L	494,476
LPG equiv. T per T of charcoal Shs	23,705	1880/Kg	514,710

# The Biomass Producer – Supplier – Consumer Chain



# Commercial and Institutional consumers of Energy; Average monthly consumption patterns around Kampala, Mpigi and Mukono

TYPE OF CONSUMER	AVERAGE EXPENDITURE		SAC USED	CHARCOAL	AVERAGE LITRS OF				UNITS OF	
	F/W USED	ON F/W	PER MONTH	EXPENDITURE	PARAFFIN	PARAFFIN EX	avgelec	expelem	ELEC SG US	AV ELEC SG
	Maximum	Maximum	Maximum	Maximum	Maximum	Maximum	Maximum	Maximum	Maximum	Maximum
prim schl	36.00.	400,000	.	.	80.00.	72,800	88.00.	80,000	30.00.	25,000
sec schl	48.00.	250,000	35.00.	210,000	60.00.	36,400	300.00.	80,000	60.00.	65,700
army/police	6.50.	15,000	.	.	.	.	.	.	.	.
brick burner	39.00.	340,000	.	.	5.00.	20,000	.	.	.	.
bakery	36.00.	600,000	30.00.	180,000	.	.	.	30,000	.	.
fish smoker	15.00.	120,000	.	.	4.00.	3,600	.	.	.	.
hospital	18.00.	187,000	4.00.	30,000	40.00.	80,000	.	70,000	.	.
hotel	72.00.	480,000	20.00.	30,000	5.00.	4,000	140.00.	60,000	35.00.	.
eating house	3.40.	45,000	15.00.	105,000	28.00.	30,800	.	40,000	.	.
breweries	1.50.	15,000	1.00.	3,000	18.00.	14,400	.	.	.	.
others	36.00.	360,000	8.00.	32,000	.	.	.	.	.	.



## Trends in Petroleum Products Consumption

