

Uganda Energy Balance for 2008

Unit: TOE	Fuelwood	Charcoal	Residues	Gasoline	AV Fuel (=Jet A1+AV Gas)	Kerosene (=Paraffin)	Diesel	Fuel oil	LPG	Electricity	TOTAL
National Production	14,936,844	0	512,512	0	0	0	0	0	0	177,788	15,627,144
Imports	0	0	0	207,051	36,645	49,365	462,403	26,813	5,203	0	787,480
Exports	0	0	0	0	0	0	0	0	0	0	0
Primary Energy supply	14,936,844	0	512,512	207,051	36,645	49,365	462,403	26,813	5,203	177,788	16,414,624
% All Primary Energy	91.0%	0.0%	3.1%	1.3%	0.2%	0.3%	2.8%	0.2%	0.0%	1.1%	100.0%
Charcoal/Elec.Production	-6,327,415	632,742	0	0	0	0	105,831	1,612	0	32,233	-5,554,998
Prod+Trans+Distr.Losses	-409973	-30,131	-24,405	-9,860	-1,745	-2,351	-22,019	-1,277	-248	-67,845	-569,853
Net Supply Available	8,199,456	602,611	488,106	197,191	34,900	47,015	440,384	25,537	4,955	109,781	10,149,936
% Net Supply Available	80.8%	5.9%	4.8%	1.9%	0.3%	0.5%	4.3%	0.3%	0.0%	1.1%	100.0%
Residential	5,957,976	406,756	488,106	0	0	42,313	0	0	3,964	28,156	6,927,271
Commercial	1,242,267	195,855	0	0	0	4,701	0	0	0	15,196	1,458,021
Industry	999,213	0	0	0	0	0	96,884	25,537	991	66,426	1,189,052
Transport	0	0	0	197,191	34,900	0	299,461	0	0	0	531,552
Agriculture	0	0	0	0	0	0	44,038	0	0	0	44,038
Other	0	0	0	0	0	0	0	0	0	2	2
TOTAL CONSUMPTION	8,199,456	602,611	488,106	197,191	34,900	47,015	440,384	25,537	4,955	109,781	10,149,936
% All secondary Energy	80.8%	5.9%	4.8%	1.9%	0.3%	0.5%	4.3%	0.3%	0.0%	1.1%	100.0%

Supply Pattern

Biomass	91.5%
Oil products	7.4%
Electricity	1.1%
TOTAL	100.0%

Demand:	Energy	Electricity
Residential	68.2%	25.6%
Commercial	14.4%	13.8%
Industrial	11.7%	60.5%
Transport	5.2%	0.0%

Energy Consumption per capita (kgOE):	341.6
Commercial Energy Cons. per capita (kgOE):	28.9
Total number of households	6226907
National Grid Electrification Rate (%)	5.0

NB: The Energy Balance does not include the energy produced by renewable energy technologies (Solar PV, biogaz) which is estimated to sum up to a minor amount.

2008

Population					Residential Biomass Consumption						
Source: UBOS, Uganda National Household Census/Statistical Abstract.					Source: Consumption factors on 'Basic Data and Assumptions'						
Last updated: May 2003, UNHS Provisional Results					Residence	Rural	Urban	Kampala	TOTAL Weight	TOTAL Energy	
					Energy carrier	1000 t/yr	1000 t/yr	1000 t/yr	1000 t/yr	TOE/yr	
Residence	Rural	Urban	Kampala	TOTAL	Wood	Wood	Charcoal	Charcoal	Residues		
Year					1000 t/yr	TOE/yr	1000 t/yr	TOE/yr	TOE/yr		
1991	14,782,083	1,115,381	774,241	16,671,705	15739	738	153	16630	5,957,976		
1994	16,439,818	1,253,926	874,214	18,567,958	51	237	280	568	406,756		
1998	18,942,857	1,465,784	1,027,875	21,436,516	1329	32	1	1362	488,106		
1999	19,626,037	1,524,121	1,070,338	22,220,496	Biomass Consumption in all sectors						
2000	20,333,855	1,584,780	1,114,555	23,033,190	Energy carrier	Wood	Wood	Charcoal	Charcoal	Residues	
2001	21,067,201	1,647,856	1,160,598	23,875,655	Sector	1000 t/yr	TOE/yr	1000 t/yr	TOE/yr	TOE/yr	
2002	21,088,418	2,452,015	1,208,544	24,748,977	Residential	16,630	5,957,976	568	406,756	488,106	
2003	21,773,885	2,490,637	1,248,850	25,513,372	Commercial	3,467	1,242,267	273	195,855	0	
2004	22,481,633	2,529,868	1,290,500	26,302,000	Industrial	2,789	999,213	0	0	0	
2005	23,212,386	2,569,716	1,333,538	27,115,641	TOTAL	22,886	8,199,456	841	602,611	488,106	
2006	23,966,892	2,610,192	1,378,013	27,955,097							
2007	24,745,922	2,651,306	1,423,970	28,821,198							
2008	25,550,274	2,693,067	1,471,461	29,714,802							
2009	26,380,772	2,735,486	1,520,535	30,636,793							
2010	27,238,264	2,778,573	1,571,245	31,588,083							
2011	28,123,628	2,822,339	1,623,647	32,569,615							
2012	29,037,771	2,866,795	1,677,797	33,582,363							
2013	29,981,628	2,911,950	1,733,753	34,627,330							
2014	30,956,164	2,957,817	1,791,574	35,705,555							
2015	31,962,377	3,004,406	1,851,324	36,818,107							
Growth Rates	3.25%	1.58%	3.34%								

Consumption of Petroleum Products in m ³										Fuelwood and charcoal consumption			
NB: The energetic use of kerosene (paraffin) amounts to 90% of kerosene sales as a rule of thumb given by a major oil company. Non-energetic use as a raw material for industrial processing, accounts generally for 10% of kerosene sales.										Source: UBOS, Statistical Abstract.			
Source: Petroleum Department MEMD, Sales Data										Last updated: SA 2002; estimation for 2002			
Energy carrier	Gasoline	Kerosene	Kerosene energetic	AV Fuel	Diesel	Fuel Oil	LPG	TOTAL energetic consumption	Year	Sector	fuelwood in '000 tons		charcoal '000 tons
Year									Year	Commercial	Industrial		
1983	63,358	39,100	35,190	22,300	67,100	23,600	500	212,048	1996	1,970	962	418	
1984	77,166	39,100	35,190	19,000	71,000	15,400	500	218,256	1997	2,034	1,014	447	
1985	87,461	43,600	39,240	21,700	75,700	11,700	500	236,301	1998	2,095	1,064	479	
1986	96,381	43,189	38,870	22,736	79,959	13,357	508	251,811	1999	2,223	1,174	526	
1987	101,540	41,022	36,920	30,000	85,818	18,200	850	273,328	2000	2,550	1,569	535	
1988	112,566	43,544	39,190	21,653	97,464	15,310	779	286,962	2001	2,640	1,750	585	
1989	123,673	47,220	42,498	31,946	108,672	13,156	562	320,507	2002	2,700	1,788	627	
1990	120,408	42,360	38,124	16,796	101,271	14,868	488	291,955	2003	2,761	1,968	671	
1991	109,512	34,562	31,106	17,546	92,672	12,809	567	264,212	2004	2,952	2,127	697	
1992	107,752	29,409	26,468	17,721	85,108	13,039	632	250,720	2005	3,081	2,286	732	
1993	115,595	29,463	26,517	35,186	83,207	15,698	663	276,866	2006	3,210	2,445	768	
1994	139,437	33,453	30,108	42,780	99,626	16,212	693	328,856	2007	3,339	2,604	804	
1995	166,048	43,068	38,761	31,556	120,395	24,566	1,005	382,331	2008	3,467	2,789	841	
1996	181,777	46,361	41,725	42,241	124,348	29,468	1,420	420,979	2009				
1997	177,044	48,576	43,718	44,643	125,621	34,124	1,629	426,779	2010				
1998	191,977	59,508	53,557	60,708	149,529	39,384	1,977	497,132	2011				
1999	202,626	60,684	54,616	50,772	179,717	42,340	2,200	532,271	2012				
2000	194,624	57,513	51,762	42,095	193,371	37,913	2,541	522,306	2013				
2001	199,956	55,501	49,951	43,915	207,181	38,591	2,892	542,486	2014				
2002	206,554	58,395	52,555	39,297	232,376	37,445	5,796	574,023	2015				
2003	199,015	46,174	41,557	80,010	244,074	47,494	3,461	615,610	NB: The data for the respective last year are based on projections; they are actualized with a two-year lag.				
2004	186,285	49,340	44,406	79,131	260,978	53,313	4,500	628,613					
2005	174,054	39,836	35,853	88,932	319,574	44,423	4,488	667,323					
2006	198,125	42,897	38,607	89,995	417,449	38,289	5,800	788,265					
2007	191,713	34,309	30,878	92,616	464,122	34,384	7,273	820,986					
2008	254,769	63,090	56,781	44,572	522,401	28,311	8,272	915,106					
2009			0					0					
2010			0					0					
2011			0					0					
2012			0					0					
2013			0					0					
2014			0					0					
2015			0					0					

Consumption of Electricity in GWh													
Source: Uganda Electricity Distribution Company, Monitoring Parameters.													
Property	Production	Exports	Supply to Uga.	Sales	Residential	Commercial	Industrial	Other	Losses	Connections	HH	Demand	Imports
Year	Hy+Th+Mub.						(Industrial& General)				Connections	(MW)	
1980	637	289	348	240	81	51	100	8.0	108	93,000			
1981	517	179	338	289	130	78	74	7.0	49	93,156			
1982	569	213	356	286	119	61	99	7.0	70	97,000			
1983	513			251									
1984	612			282									
1985	626	215	411	244					167	119,000	79,000	111	
1986	637	281	356	299	139	108	41	11.0	57	120,000	79,000	107	
1987	619	170	449	338					111	105,000	65,000	104	
1988	567	110	457	263					194	87,000	60,000	95	
1989	661	157	504	276					228	104,000	85,000	111	
1990	738	166	572	408	274	84	45	5.0	164	112,000	85,000	123	
1991	785	150	635	504	328	100	65	11.0	131	100,000	90,000	136	
1992	994	289	705	496	263	142	73	18.0	209	110,809		151	
1993	978	259	719	473	272	127	71	3.0	246	116,885		157	
1994	1,018	252	766	489	286	116	82	5.0	277	107,621		161	
1995	1,057	195	862	487	267	120	98	2.0	375	108,616		174	
1996	1,130	151	979	564	367	159	36	2.0	415	121,388	112,000	177	
1997	1,218	169	1,049	705	349	194	160	2.0	344	149,899	126,289	178	
1998	1,253	159	1,094	865	310	190	160	2.0	532	155,612	141,100		
1999	1,342	174	1,165	876	307	107	285	2.3	465	164,225	144,507	180	
2000	1,555	251	1,304	843	312	122	407	1.9	461	180,234	160,352	260	1.1
2001	1,593	145	1,448	906	352	172	380	2.4	542	200,210	179,263	260	1.4
2002	1,718	265	1,456	877	362	133	374	9.1	579	224,871	202,447	245	2.5
2003	1,768	219	1,549	1,057	418	152	484	3.9	492	244,248	220,558	279	3.0
2004	1,896	197	1,699	826	344	135	346	0.2	873	262,121	237,830	247	2.2
2005	1,857	63	1,794	1,072	341	133	597	1.2	722	292,237	263,262	232	1.9
2006	1,539	36	1,503	971	284	128	558	0.6	532				
2007	1,740	0	1,740	1,103	293	116	693	0.2	637				59.8
2008	2,067	0	2,067	1,278	327	177	772	1.9	789		310,000		
2009			0	0					0				
2010			0	0					0				

Data for Connections between 1985 and 1991 derive from the graph "Consumer Mix", p.59, UEB 33rd report and accounts, 1996, and can contain errors caused by inexact reading of the graph. Data for 1998 consumption by sectors derives from the graph "Units sold, during the last five years", p.12, UEB Report and Accounty of 1999, and can also contain reading errors.

Properties of Energy Carriers						
Property Energy Carrier	Calorific Value (FAO)		Density	Calorific Value (World Bank)		IPCC
	GJ/m3	GJ/t	t/m3	TOE/t	TOE/m3	GJ/t
Gasoline	34	44	0.72	1.03	0.774	44.8
Diesel	36	42.7	0.85	0.995	0.843	43.3
Heavy Fuel Oil	39	40.1	0.961	0.956	0.902	43.5
Kerosene		43.1		1.01	0.828	44.5
LPG		45.3	0.56	1.07	0.599	47.3
Natural Gas	0.03					
LNG	20	39.36				
AV Fuel				1.01	0.783	44.8
Wood		15		0.375	0.262	10.1
Charcoal		30		0.773		
Electricity						86

Biomass consumption factors for the household sector			
Source: ESMAP Study, 1994			
Residence	Rural	Urban	Kampala
Energy carrier	kg/cap/yr	kg/cap/yr	kg/cap/yr
Wood	616	274	104
Charcoal	2	88	190
Residues	52	12	1

Conversion factors				
Source: EAP 2000, Energy Balance Course based on European Community norms				
	kilocalorie	Megajoule	kilowatt-hour	metric ton of oil equivalent
abbreviation	kcal	MJ	kWh	mtoe
kcal	1	0.0042	0.0012	1.003E-07
MJ	239	1	0.2887	0.00002388
kWh	860.4	3.6	1	0.00008598
mtoe	9,969,000	41,868	11,630	1

Losses (%)		
Production+ Transport+ Distribution	Biomass	Oil Products
	5%	5%

Conversion efficiency	
Wood to Charcoal	0.1 (MWLE Forest Sector Review 2001)
Diesel to Electricity	0.3 (general technical factor)

Petroleum products consumption factors for all sectors (Assumptions)						
Product	Gasoline	AV Fuel	Kerosene (energetic use)	Diesel	Fuel Oil	LPG
Residential	0%	0%	90%	0%	0%	80%
Commercial	0%	0%	10%	0%	0%	0%
Industry	0%	0%	0%	22%	100%	20%
Transport	100%	100%	0%	68%	0%	0%
Agriculture	0%	0%	0%	10%	0%	0%
Other	0%	0%	0%	0%	0%	0%

Year	1998	1999	2000	2001	2002	2003
End Energy Consumed in toe	6,657,317	6,953,819	7,331,966	7,765,810	7,988,542	8,372,822
Energy Mix: Supply Pattern						
Biomass	93.1%	92.9%	93.2%	93.3%	93.4%	92.9%
Oil products	6.1%	6.2%	5.8%	5.7%	5.7%	6.0%
Electricity	0.9%	0.9%	1.0%	1.0%	0.9%	1.1%
Demand: Energy						
Residential	75.8%	75.2%	73.9%	72.3%	72.9%	71.9%
Commercial	12.8%	12.9%	12.7%	14.1%	13.5%	13.6%
Industrial	6.7%	7.1%	8.9%	9.2%	9.2%	9.8%
Transport	4.5%	4.6%	4.3%	4.2%	4.2%	4.6%
Demand: Electricity						
Residential	47.0%	43.9%	37.1%	38.9%	41.6%	39.7%
Commercial	28.8%	15.3%	14.5%	19.0%	15.3%	14.4%
Industrial	24.2%	40.8%	48.4%	42.1%	43.0%	45.9%

