

ANNEXURE B: LPG CONSUMPTION DYNAMICS IN SOUTH AFRICAN HOUSEHOLDS

15.3. This section unpacks the characteristics of energy consumption amongst South Africa households. Information was sourced primarily from the Department of Energy's 2012 survey of energy-related behaviour in the South African residential sector.²⁷² In addition, data captured in the National Income Dynamics Study ("NIDS") was examined to identify trends and characteristics of South African households' LPG consumption.

*Energy sources and energy mix in South African households*²⁷³

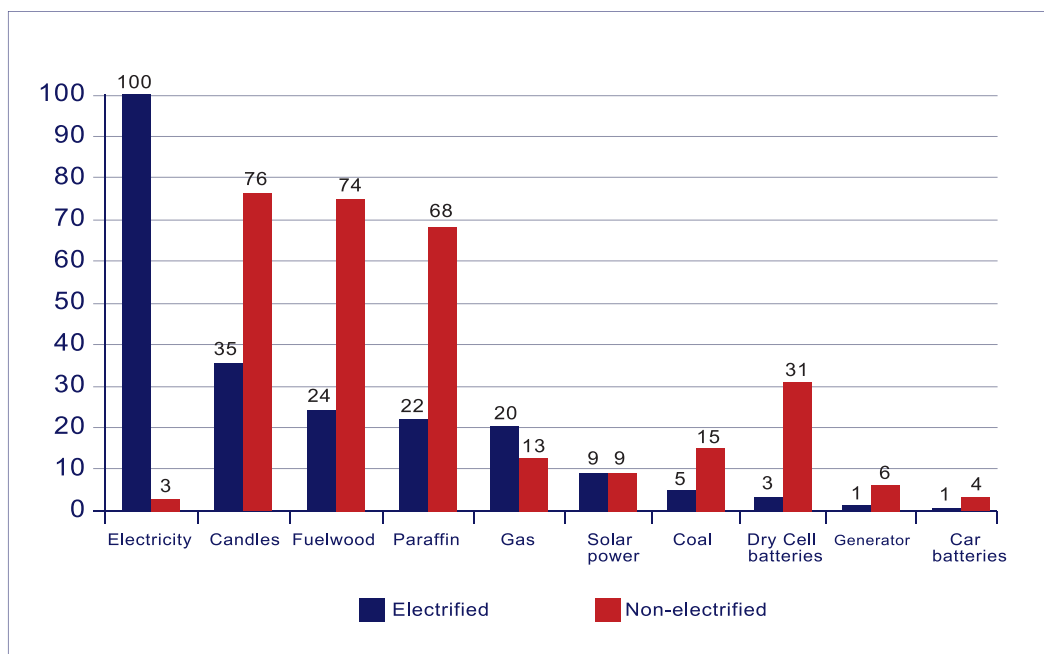
15.4. South African households tend to rely on multiple energy sources to meet their daily energy requirements. The types of energy sources relied upon will differ depending on whether the household has an electricity connection.

15.5. In terms of the **electrification status of households**, it was found households with electricity rely on electricity for lighting, cooking and heating, although using other sources like candles, firewood, paraffin and gas are also relied upon. In the absence of an electrical connection, non-electrified households rely primarily on candles, firewood and paraffin, with a nominal share of households reporting the use of coal or gas. Using gas is higher amongst electrified households (20% of households) than among non-electrified households (13% of households).

272 Department of Energy. 2013. *A Survey of Energy Related Behaviour and Perceptions in South Africa: The Residential Sector*. Available from <http://www.energy.gov.za/files/media/Pub/Survey%20of%20Energy%20related%20behaviour%20and%20perception%20in%20SA%20-%20Residential%20Sector%20-%202012.pdf>.

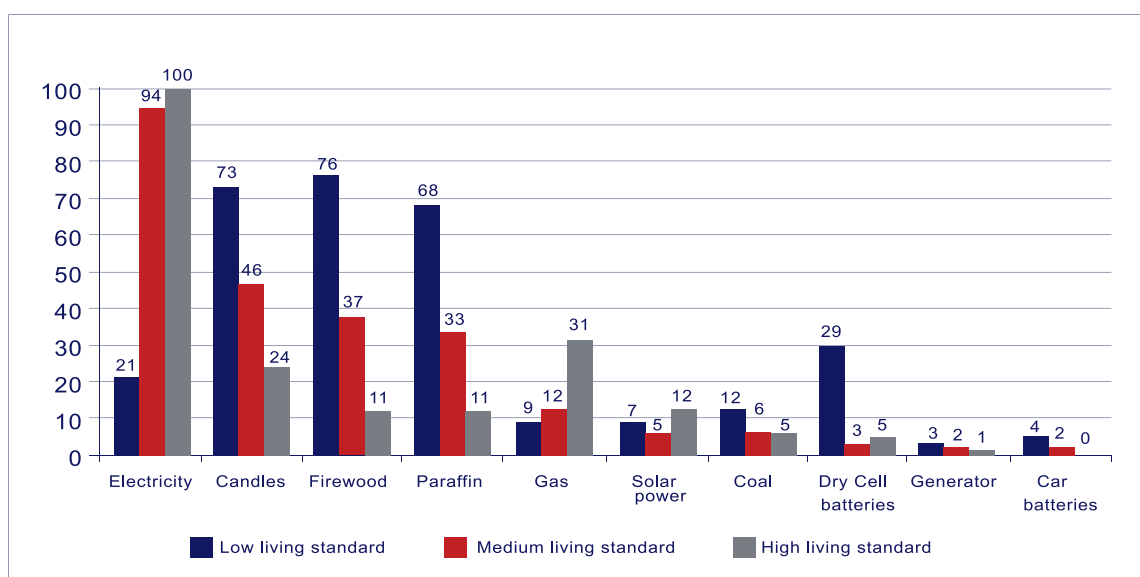
273 Department of Energy. 2013. *A Survey of Energy Related Behaviour and Perceptions in South Africa: The Residential Sector*. Available from <http://www.energy.gov.za/files/media/Pub/Survey%20of%20Energy%20related%20behaviour%20and%20perception%20in%20SA%20-%20Residential%20Sector%20-%202012.pdf>

Figure 29: Use of energy sources by electrification status, 2012



15.6. In evaluating gas consumption amongst households with different *living standards*, it was observed that as households' living standard (and t income) increases, the likelihood that gas will be selected as an energy source improves. From a multiple energy use perspective, it is observed that even households with a high living standard rely on a range of energy sources other than electricity, albeit to a lesser degree that those households with a greater material disadvantage.

Figure 30: Use of energy sources for any purpose, by living standard (% using), 2012



- 15.7. In terms of **geographic area**, the domestic use of gas tends to have a greater presence on rural farms and in formal rural areas, especially amongst higher-income electrified households.

Table 30: Households reporting use of energy source, by geographic location and province, 2012

	Electricity	Candles	Firewood	Paraffin	Gas	Solar power	Coal	Dry cell batteries	Generator	Car batteries	Unweighted N
South Africa	92	38	28	26	20	9	6	6	1	1	2518
Geographic location											
Urban formal	99	26	11	18	24	11	4	4	1	1	1552
Urban informal	83	38	17	47	7	7	13	16	1	2	223
Rural trad. auth. areas	84	66	65	33	11	8	8	6	1	1	536
Farms	72	42	52	36	26	7	11	8	5	1	207

- 15.8. Over three-quarters (77%) of South African households use electricity as their main **energy source for cooking**, while 10% continue to depend on firewood. A marginal number of households use gas (5%), paraffin (4%), solar electricity (3%) and coal (1%). Only 6% of electrified households continue to rely on firewood as a main cooking source, closely followed by gas (5%). In non-electrified households, firewood (54%) and paraffin (38%) dominate as the energy sources for cooking, again followed by gas (5%).

Table 31: Main energy used for cooking, by electrification status

	Electricity	Firewood	Paraffin	Gas	Solar System	Coal	Generator	Other	Total	Base N
South Africa	77	10	4	5	3	1	0	0	100	2470
Electrified	84	6	1	5	3	1	0	0	100	2214
Non-electrified	1	54	38	5	0	2	0	0	100	244

- 15.9. Across geographic locations, gas is mostly used amongst urban formal households for cooking. This gas could comprise either piped natural gas or LPG. Gas usage in other geographic locations, likely to be LPG, is observed in between 2% to 3% of households.

Table 32: Main energy source for cooking, by geographic location

	Electricity	Firewood	Paraffin	Gas	Solar System	Coal	Generator	Other	Total	Base N
South Africa	77	10	4	5	3	1	0	0	100	2470
Geographic location										
Urban formal	88	0	1	6	4	0	0	0	100	1528
Urban informal	72	3	21	3	1	0	0	0	100	215
Rural trad. auth. Areas	59	33	4	3	1	0	0	0	100	524
Farms	64	20	8	2	2	5	0	0	100	203

- 15.10. Finally, in terms of the **energy mix in cooking**, it was found that 60% of South African households use a single energy source – typically electricity (47%) – for their cooking requirements. Of the remaining 40% using a range of energy sources, electricity and firewood (10%), gas and electricity (10%) and electricity and paraffin (9%) were found the most common energy source mixes. For energy combinations including gas, it was found, predominantly households with a high living standard include gas in their energy mix for cooking as a supplement to electricity.

Table 33: Energy choice for cooking, by electrification status and living standard

Multiple energy sources for cooking	South Africa	Electrified	Non-electrified	Low	Medium	High
Single energy use	60	60	66	58	54	66
Electricity only	47	51	1	2	41	61
Firewood only	6	4	37	34	7	0
Paraffin only	2	0	23	21	2	0
Gas only	2	2	3	0	2	3
Solar system only	2	2	0	0	1	2
Coal only	0	0	2	1	1	0
Other source only	0	0	0	0	0	0
Multiple energy use	40	40	34	42	46	34
Firewood & electricity	10	11	0	2	15	6

Multiple energy sources for cooking	South Africa	Electrified	Non-electrified	Low	Medium	High
Gas & electricity	10	10	0	0	5	17
Paraffin & electricity	9	10	0	4	15	5
Paraffin, firewood & electricity	2	3	0	2	4	0
Paraffin & firewood	2	0	24	25	1	0
Paraffin, gas & electricity	1	1	0	0	1	1
Gas, firewood & electricity	1	1	0	0	1	1
Coal & electricity	1	1	0	0	1	0
Paraffin & gas	0	0	3	4	0	0
Paraffin, gas & firewood	0	0	2	2	0	0
Other energy combinations	4	4	5	3	4	4
Total	100	100	100	100	100	100

15.11. In terms of **energy sources used for heating**, it was observed that on aggregate, 61% of South African households use an energy source to heat spaces and to keep warm. More specifically, 41% of households use electricity as the main source for space heating, while 9% use firewood and 5% paraffin. Coal, gas and other sources are used in less than 5% of households.

15.12. Households with low living standards exhibit similar patterns as non-electrified households in terms of the main energy source for heating; 33% use firewood, 14% use paraffin, 3% use electricity, and 47% use no energy source. In contrast, households with medium and high living standards predominantly use electricity for space heating (37% and 50% respectively), followed by firewood (12%) and gas (5%).

15.13. Regarding the **energy mix used for heating** by households, the use of gas is only observed amongst electrified households with medium and high living standards. The energy combination of gas and electricity is most pronounced amongst households with a high living standard, and could include using either piped natural gas or LPG.

Table 34: Main energy source used for heating rooms and keeping warm, by electrification status, living standard and location

	Energy source								No energy source						Total	Base N
	Electricity	Firewood	Paraffin	Coal	Gas	Dry cell batteries	Solar System	Generator	Warm clothing	Blankets	Hot water bottle	Other	None of the above (Don't know)			
South Africa	41	9	5	2	3	1	0	0	20	18	0	0	2	0	100	2451
Electrification status																
Electrified	45	7	4	1	3	1	0	0	20	17	0	0	2	0	100	2193
Non-electrified	1	29	11	5	0	0	0	0	21	28	0	0	4	0	100	246
Living standard level																
Low	3	33	14	3	0	0	1	0	19	23	0	0	5	0	100	197
Medium	37	12	7	2	1	1	0	0	20	18	1	0	2	0	100	1110
High	50	1	1	1	5	1	0	0	21	18	0	0	1	0	100	915
Per capita income quintiles																
Poorest quintile	28	22	7	3	0	0	0	0	21	16	0	0	3	0	100	419
Quintile 2	34	11	6	3	2	1	0	0	25	17	0	0	1	0	100	448
Quintile 3	40	8	5	2	1	0	0	0	21	21	1	0	2	0	100	532
Quintile 4	46	3	4	0	1	1	0	0	17	26	1	0	1	0	100	523
Richest quintile	53	1	1	1	10	2	0	0	17	11	1	0	3	0	100	491
Geographic location																
Urban formal	51	1	3	2	4	1	0	0	18	17	0	0	2	0	100	1508
Urban informal	28	6	15	4	1	1	0	1	29	11	2	0	3	0	100	218
Rural trad. auth. areas	25	25	6	1	0	1	0	0	24	17	0	0	1	0	100	521
Farms	31	18	2	3	0	0	0	0	13	31	0	0	1	0	100	204

Energy trends observed from the National Income Dynamics Survey (“NIDS”)

- 15.14. Data from the NIDS survey evaluated households’ choice of energy source for heating and cooking. Examination of the data found that in terms of households’ **primary energy source for heating**, a large and increasing proportion of households use electricity for heating, followed by wood (which fluctuates within the 15%–25% range), paraffin and a decreasing share of coal. The portion of households that use gas remains limited, although there has been some marginal growth over the 2010 to 2012 period.

Table 35: Households' primary energy source used for heating

Primary source of energy used for heating						
	2008		2010		2012	
	Freq.	Per cent	Freq.	Per cent	Freq.	Per cent
Electricity from mains	3812	52,2%	4444	65,5%	5144	64,0%
Wood	1824	25,0%	1156	17,0%	1651	20,5%
Paraffin	518	7,1%	539	7,9%	464	5,8%
Coal	178	2,4%	146	2,2%	117	1,5%
Gas	60	0,8%	54	0,8%	88	1,1%
Other	904	12,4%	447	6,6%	576	7,2%
Total	7296	100%	6786	100%	8040	100%

15.15. The *primary energy source used for cooking* is electricity, the usage of which has increased by 10% over the period, as presented in Table 13. Using wood for cooking has remained stagnant, whilst paraffin usage has decreased by almost 6% over the period. Gas is the fourth most common energy source used for cooking, although it was used by only 2,6% of households according to the 2012 survey.

Table 36: Households' primary energy source used for cooking

Primary source of energy used for cooking						
	2008		2010		2012	
	Freq.	Per cent	Freq.	Per cent	Freq.	Per cent
Electricity from mains	4696	64,4%	4929	72,6%	6021	74,9%
Wood	1386	19,0%	985	14,5%	1256	15,6%
Paraffin	837	11,5%	552	8,1%	457	5,7%
Gas	195	2,7%	107	1,6%	208	2,6%
Coal	75	1,0%	89	1,3%	60	0,7%
Other	201	1,5%	124	1,8%	69	0,5%
Total	7390	100,0%	6786	100,0%	8071	100,0%