

# Household paraffin consumption in four areas: Benoni, Galeshewe, Gugulethu and Lady Grey

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## **Abstract**

*The perception still exists amongst decision makers that paraffin consumption will decrease with increased rates of electrification. Electricity is only added to the fuel mix used by households. Although paraffin is often perceived to be a more affordable fuel than electricity, households spend more of their monthly income on buying paraffin than any other fuel. Although the baseline survey from which the data was derived was not conducted primarily to confirm paraffin consumption patterns of households, it still illustrates the prevailing use and high expenditure on the fuel.*

*Keywords: Benoni, Galeshewe, Gugulethu, Lady Grey, Paraffin Safety Association of South Africa, paraffin, households, energy expenditure*

## **1. Introduction**

At an experts forum organised by the Paraffin Safety Association of Southern Africa (PASASA), the problems and issues surrounding paraffin use were highlighted and the conclusion drawn that 'the use of paraffin for household energy has an unacceptably high harmful incident rate in South Africa.' (PASASA, 2004) The concerted effort by PASASA to tackle specific issues such as safe packaging, safe appliances and safety education is extremely encouraging, especially since measures to address these issues have been bounced around for a number of years.

There also seems to be a perception, especially amongst decision-makers, that household paraffin use is declining in the wake of increased electrification levels. Although some houses may increase the number of fuels used for a specific end-use, for example, include electricity in their fuel mix, the use of paraffin is still pervasive for specific end-uses such

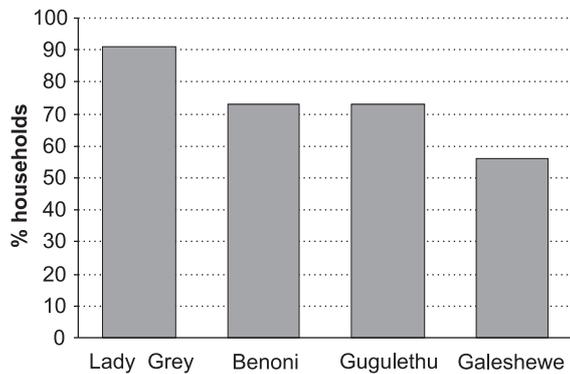
as cooking, water heating and space heating (Truran, 2004). This is true because alternatives to paraffin are not necessarily affordable or perceived as affordable by low-income households. The paper describes the use of paraffin in four areas and illustrates that paraffin is still widely used in electrified areas by the majority of households in the sample and that households spend more money on paraffin than on any other fuel in use.

## **2. Background**

Palmer Development Consulting (PDC) conducted a baseline survey in Lady Grey, Benoni, Galeshewe and Gugulethu to monitor the impact of energy efficient housing design in South Africa on energy consumption, health and carbon emissions. The samples of households in each area were small because of the limited number of energy efficient houses per area. After attending PASASA's Experts Forum in June 2004, PDC decided to verify existing paraffin data with the data available from the monitoring study. The main aim of the additional analysis was to determine if electrification and the availability of electricity impacted on paraffin use and furthermore, to provide data on fuel consumption patterns in areas hitherto excluded from general fuel surveys.

## **3. Energy use**

Of the households that were included in the baseline survey, a large number of households in the project areas of the Eastern Cape, Western Cape, Northern Cape and Gauteng were found to be using paraffin, illustrated in Figure 1. The area with the lowest percentage of Households using paraffin still shows more than 50 percent of the households using the fuel. It was concluded that paraffin use is widespread in the project areas and although not all households used it, the fuel is used to a significant



**Figure 1: Percentage of households per area using paraffin**

extent. It should further be noted that all areas have been electrified for four years or more and all households interviewed had access to electricity.

The pattern of multiple household fuel use was encountered in each area, with paraffin used in conjunction with a variety of other fuels for multiple end-uses. The combinations of paraffin and other fuels that are used in Benoni, Galeshewe, Gugulethu and Lady Grey are illustrated in Table 1.

**Table 1: Fuel combinations in use**

Code	Fuel combinations
1	Paraffin, electricity, coal, candles, wood
2	Paraffin, coal, candles, wood
3	Paraffin, candles, wood
4	Paraffin, coal, wood
5	Paraffin, electricity
6	Paraffin, electricity, coal, wood
7	Paraffin, candles
8	Paraffin, electricity, coal
9	Paraffin, electricity, gas
10	Paraffin, electricity, wood, cow dung

This illustrates that paraffin use is ubiquitous – it is found in rural, peri-urban and urban settings and is omni-present as a household fuel in low-income households.

### 3.1 Benoni

73 percent of the households surveyed used paraffin. 73 percent of the paraffin users use it for cooking in summer but only 45 percent use it for cooking in winter. This is due to the fact that Benoni is a coal consumption area where coal is used in winter for its dual purpose of providing energy for cooking and space heating. 55 percent of the paraffin users use it for water heating in summer but only 36 percent use it for water heating in winter. 27 percent of the paraffin users use it for space heating in winter and 18 percent use it for ironing. Using paraffin for ironing may sound strange but households heat

cast-iron irons on paraffin stoves.

Benoni has the most fuel combinations that are being used compared to the other areas surveyed and the most reported combination that is being used is paraffin, electricity, coal and wood.

### 3.2 Galeshewe

56 percent of the households surveyed used paraffin. All the paraffin users use it for cooking in summer but only 78 percent of them use it for cooking in winter. 44 percent of the paraffin users use it for water heating and space heating and 22 percent use it for ironing. In this area, the most reported fuel combination used is paraffin and electricity.

### 3.3 Gugulethu

73 percent of the households surveyed used paraffin. 36 percent of the paraffin users use it for cooking in both summer and winter. Only nine percent of the paraffin users use it for water heating and ironing, but 91 percent use it for space heating. In this area, the most reported fuel combination used is also paraffin and electricity.

### 3.4 Lady Grey

91 percent of the households surveyed used paraffin. All the paraffin users use it for cooking in both summer and winter. 50 percent use paraffin in summer for water heating and 60 percent in winter. 70 percent of the paraffin users use it for space heating and 40 percent use it for ironing in summer and 30 percent in winter. The most reported fuel combination used is paraffin, electricity, coal and wood, followed by paraffin and electricity.

## 4. Energy expenditure

The cost of paraffin in the following tables are only averages and do not correlate 100 percent with the quantities bought because some households buy in bulk and get a discount where others do not, therefore, the discrepancy between quantity and cost. The results from the analysis is interesting since it illustrates that in general, households spend more on paraffin than on any other household fuel, both in summer and winter. This is illustrated in Table 2.

**Table 2: Highest expenditure on fuel per season**

Area	Summer	Winter
Benoni	Paraffin	Coal
Galeshewe	Paraffin	Paraffin
Gugulethu	Electricity	Paraffin
Lady Grey	Paraffin	Paraffin

It can therefore be concluded that household expenditure on paraffin is high and a large portion of household income is spent on the fuel.

#### 4.1 Benoni

Although the monthly expenditure is higher in winter, the percentage of monthly income spent on fuels is lower because two of the households do not use paraffin in winter. See Tables 3 and 4.

**Table 3: Monthly paraffin expenditure (averages)**

	Quantity (litres)	Cost (R)	% of income
Summer	23	75	9.4
Winter	32	93	8.8

**Table 4: Percentage of income spent on other fuels**

	Electricity	Coal	Candles	Wood
Summer	5.7	9.7	2.8	0.1
Winter	5	23	2.6	0.1

The households spent on average the highest percentage of their income on coal in both summer and winter compared to other fuels used in this area. The percentage of income spent on fuels in summer is just 0.3 percent lower for paraffin.

#### 4.2 Galeshewe

In Galeshewe, expenditure on electricity in summer is high but expenditure on paraffin is nevertheless higher. See Table 5.

**Table 5: Monthly paraffin expenditure (averages)**

	Quantity (litres)	Cost (R)	% of income
Summer	24	83	14.2
Winter	27	114	20.4

One of the sample households does not use paraffin in winter. Of all four areas, Galeshewe households spent the highest percentages of their income buying paraffin in both summer and winter.

The households spent on average the highest percentage of their income on paraffin in both summer and winter compared to other fuels used in this area. See Table 6.

**Table 6: Percentage of income spent on other fuels**

	Electricity	Coal	Candles	Wood
Summer	12.8	0	8	0
Winter	9.4	17.3	12	2.2

#### 4.3 Gugulethu

In Gugulethu, households spend more on electricity in summer than on paraffin and households in Gugulethu also made use of a smaller variety of fuels and fuel combinations. See Table 7.

**Table 7: Monthly paraffin expenditure (averages)**

	Quantity (litres)	Cost (R)	% of income
Summer	7	24	2.2
Winter	51	163	18.9

Five of the households do not use paraffin in summer and one does not use paraffin in winter. Of all four areas, Gugulethu has the highest quantity of paraffin use in winter but the lowest in summer. This correlates with the previous finding that 91 percent of the paraffin users use it for space heating in winter.

The households spent on average the highest percentage of their income on paraffin in winter but in summer the highest percentage of their income is spent on electricity. See Table 8.

**Table 8: Percentage of income spent on other fuels**

	Electricity	Gas
Summer	10.8	9.1
Winter	11	15.6

#### 4.4 Lady Grey

The households spent on average the highest percentage of their income on paraffin in both summer and winter compared to other fuels used in this area. See Tables 9 and 10.

**Table 9: Monthly paraffin expenditure (averages)**

	Quantity (litres)	Cost (R)	% of income
Summer	21	79	10.4
Winter	32	115	17.5

**Table 10: Percentage of income spent on other fuels**

	Electricity	Coal	Candles	Wood
Summer	5.8	0	2.5	1.3
Winter	9.7	10.3	3.2	2.1

### 5. Summary and conclusions

In all four the areas, more than 50 percent of the households use paraffin. Paraffin is not used on its own but in different fuel mixes and fuel combinations, *i.e.* mostly with electricity, or electricity, coal, wood and candles. Paraffin is used for cooking, water heating, space heating and ironing, although not all households use paraffin for all these end uses. In three of the areas, paraffin is the preferred

cooking fuel and it is only in Gugulethu, where electricity is mostly used for cooking. However, paraffin use is very high for space heating in winter in this area. In three of the areas, the percentage of the monthly income that the household spends on paraffin is the highest for one or both seasons. It is only in Benoni where the percentage of income spent on coal is slightly higher.

The paper illustrates that, despite access to electricity and regardless of income, education and household size, paraffin use remains high and household expenditure on paraffin is higher than on any other fuel in use.

## **References**

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