

Joburg Energy Usage



For further information
Please contact:

Kate Joseph
KateJ@Joburg.org.za

Developed with Christina Culwick,
Senior Researcher at Gauteng
City-Region Observatory

Original mapping by Sandiswa
Sondzaba, Gauteng City-Region
Observatory

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Sample

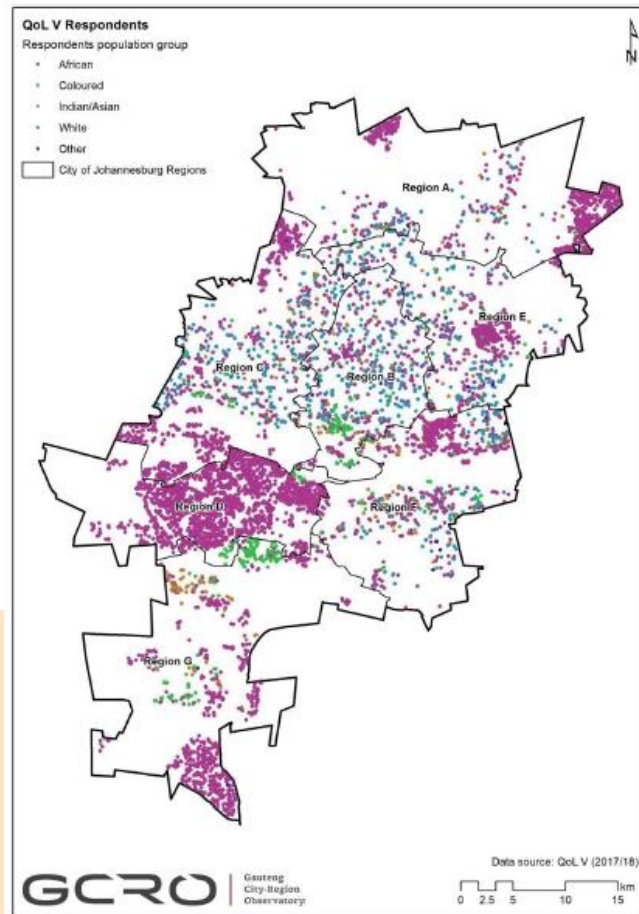
Results are drawn from Gauteng City-Region Observatory's Quality of Life (QoL) V survey conducted in 2017/18 throughout the province.

The entire dataset was **weighted by race and sex at ward level**. Weights were aligned to Census 2011, updated in line with Community Survey 2016.

A total of **7 869 interviews**, or 32% of the sample, were collected in City of Johannesburg (unweighted). When weighted, 9 119 (37%).

In Johannesburg a minimum of **50 responses per ward** was collected.

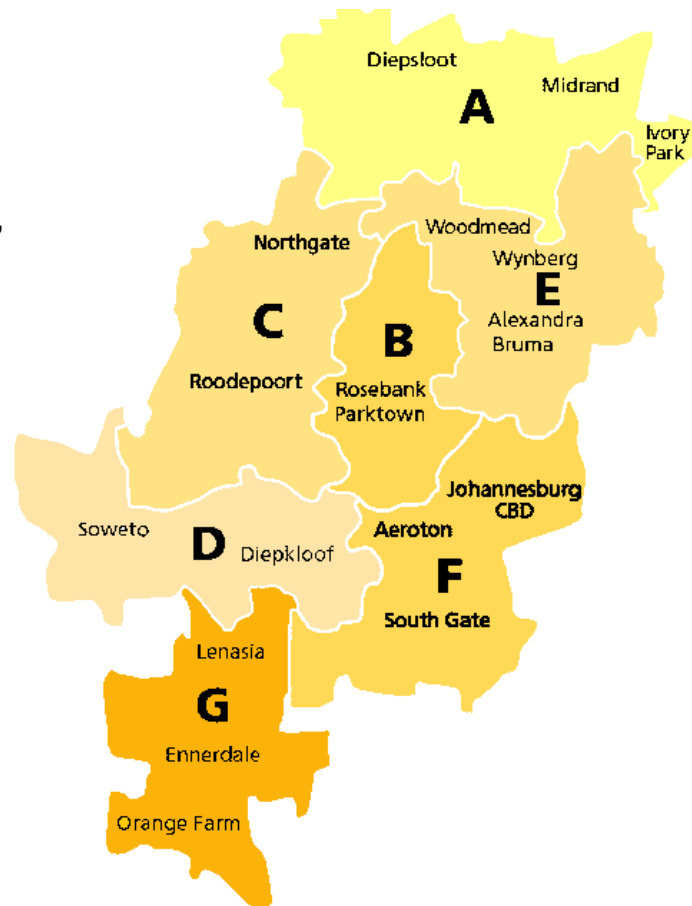
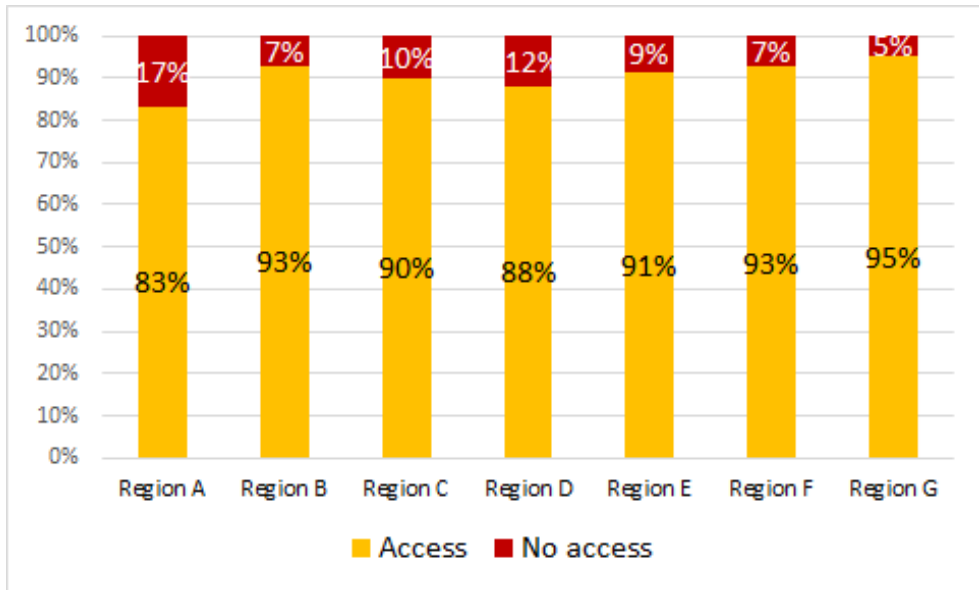
	CoJ (Unweighted)	CoJ (weighted)	Provincial (weighted)
% Female	51.3%	48.4%	49.4%
% African	80.5%	75.4%	78.7%
% Indian/ Asian	2.8%	4.5%	2.6%
% Coloured	5.9%	5.4%	3.3%
% White	10.5%	14%	14.6%



Access to electricity

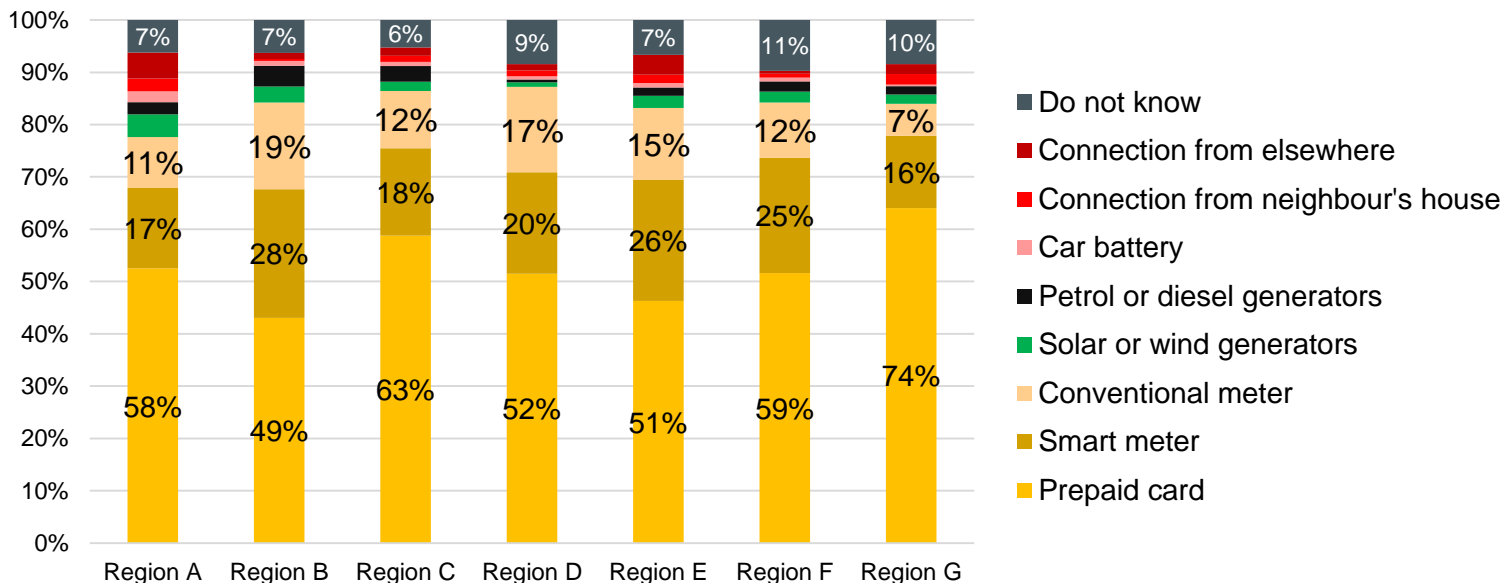
90% of Johannesburg residents have access to electricity.

Joburg has good access to electricity. Even in areas where access is lower, such in Diepsloot and Soweto, more than 80% of residents report having access.



Electricity types

According to City Power about 80% of Johannesburg's electricity is distributed by the utility and the rest is distributed by Eskom. Across the city, the majority of QoL respondents, **58%**, reported that they use prepaid cards to purchase electricity. At least **2%** of respondents report using a connection from elsewhere. Some 2% of respondents use renewable energy sources like solar or wind generators.



Energy poverty

Energy poverty refers to large numbers of people whose wellbeing is negatively affected by very low consumption of energy, the use of dirty or polluting fuels, and or excessive time spent collecting fuel to meet basic needs.

According to the Energy Poverty Action initiative of the World Economic Forum, access to energy is fundamental to improving quality of life and is a key imperative for economic development.

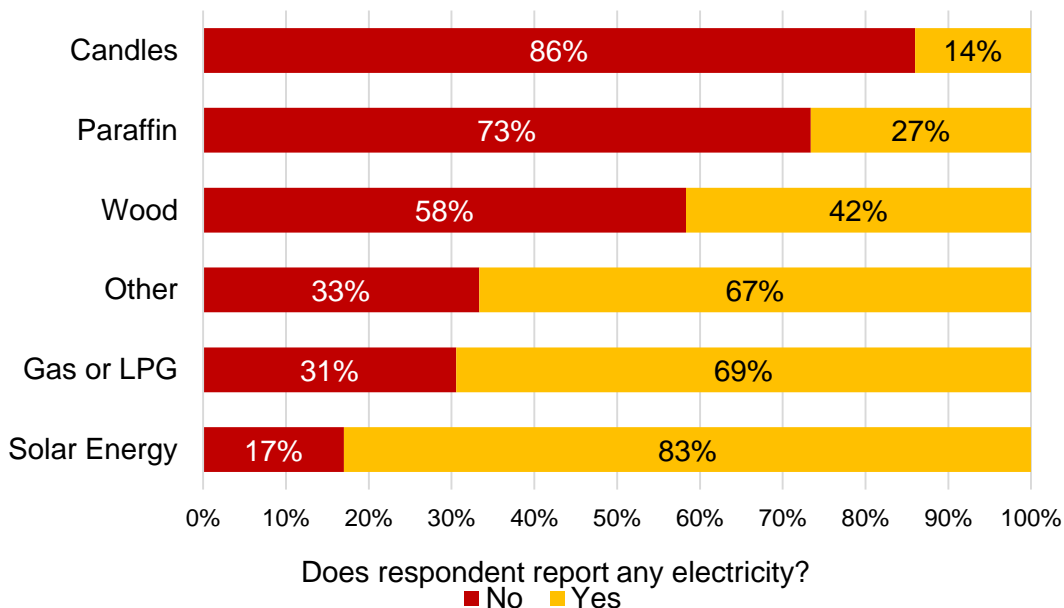
Many households in poorer communities either do not have access to, or cannot afford to use, electricity for their energy needs. Instead, alternative fuels such as coal, gas, paraffin, wood and animal dung are used. The City of Johannesburg has ambient air quality monitoring stations at **Alexandra, Orange Farm, Jabavu, Diepsloot and Ivory Park** (among other locations) specifically to monitor **domestic fuel burning**, which contributes to air pollution & health risks and is an indicator of energy poverty.

Visit GCRO's Map of the Month related to [use of alternative fuels for cooking and health in Gauteng](#) for more information.

Access to electricity but use alternative source for lighting

At least 2% of people in Joburg who have access to electricity use alternative power for most of their lighting needs. This amounts to nearly **87 000 people** in the city.

Power source most used for lighting (excluding electricity)



After electricity, **candles and paraffin** are the most common sources for lighting. Some 14% of those who use candles for lighting and 27% of those who use paraffin also have access to electricity.

People are likely to avoid using electricity because it is costly.

The majority of people who do use sustainable energy (like as solar or propane (also know as liquefied petroleum gas or LPG)) also have access to electricity and can use both.

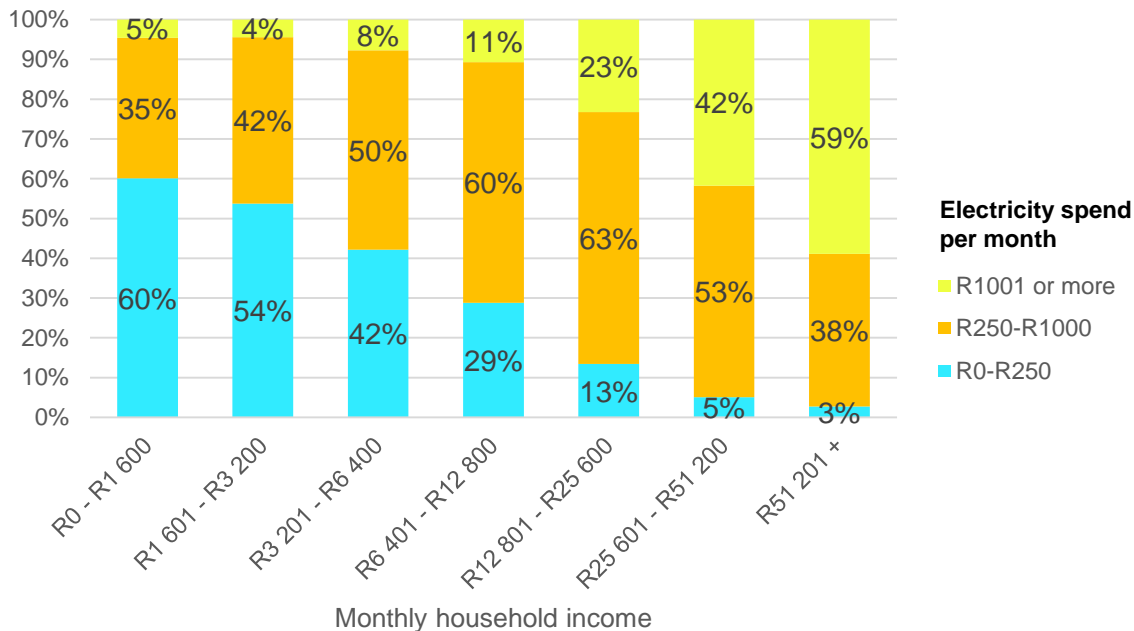
Monthly household electricity spend by income

At household level there is a clear correlation between electricity spend and income, with the poor spending significantly less on electricity than the wealthy.

This has a number of implications. **As people move out of poverty their demand for electricity increases.** However, these increases will likely be counteracted by increased electricity costs, which will disproportionately affect the poor, who will likely have to **reduce their electricity usage** and instead **rely on alternative fuels** that are likely to be more polluting.

On the other end of the spectrum, as electricity costs increase, the **commercial and industrial sectors** who are charged the most for electricity and subsidise middle and lower income households,¹ **will be increasingly incentivised to shift** to solar off grid technologies **or move** to areas outside of the City's energy supply. This will have implications for cross-subsidisation and the overall affordability of electricity. ¹ Information from City Power.

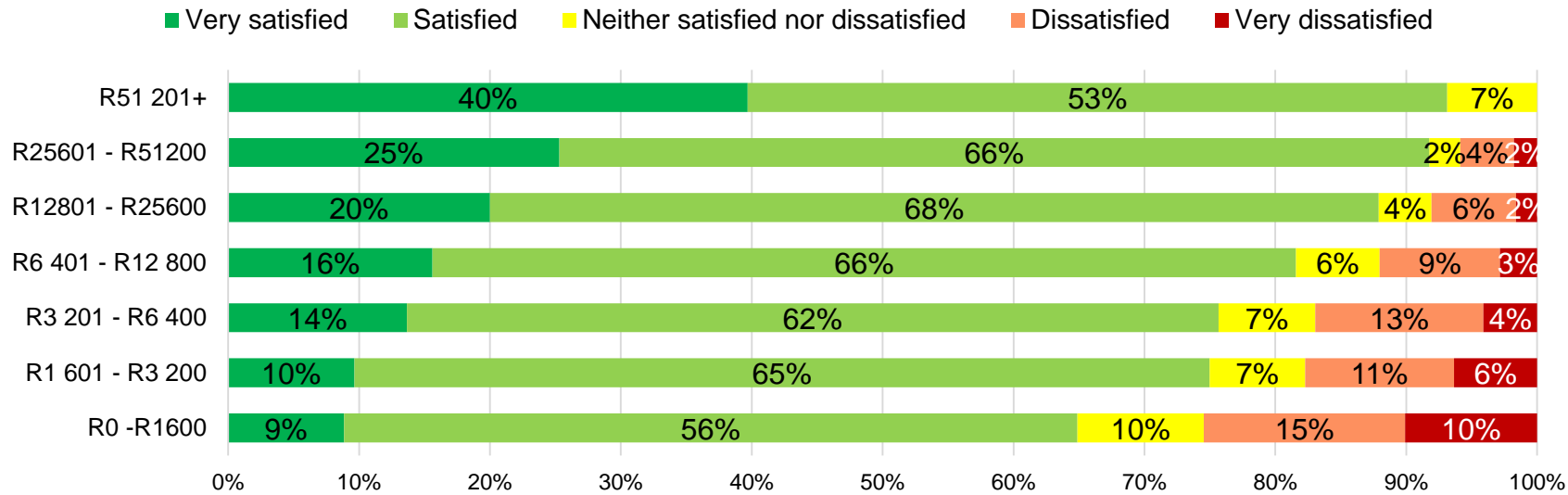
Monthly household electricity spend by household income*



*excludes responses 'don't know' & 'not applicable'

Satisfaction with electricity

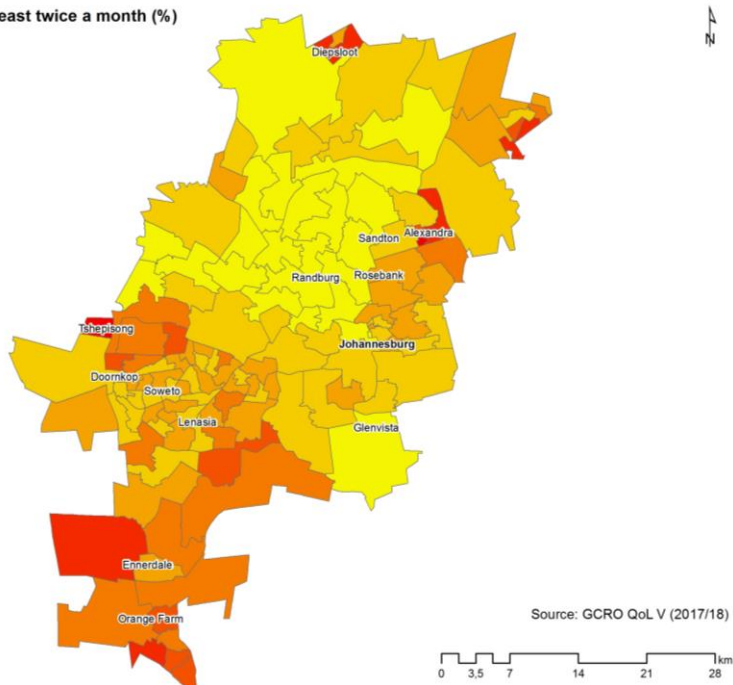
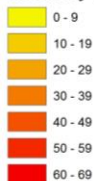
People who earn more tend to be more satisfied with the energy they received while people who **earn less** tend to be **less satisfied** with the electricity received. Low income respondents were also more likely to report experiencing energy interruptions than affluent residents were.



Frequency & location of electricity interruptions

Before this year's round of load shedding most CoJ residents reported experiencing power interruptions only a couple of times a year. Those who reported more frequent outages tend to live in lower income communities.

Electricity interruptions at least twice a month (%)



In the past year, how often, if ever, did you experience electricity interruptions?

%

Every week

5%

A couple of times a month

19%

Once a month

6%

A couple of times a year

37%

Never

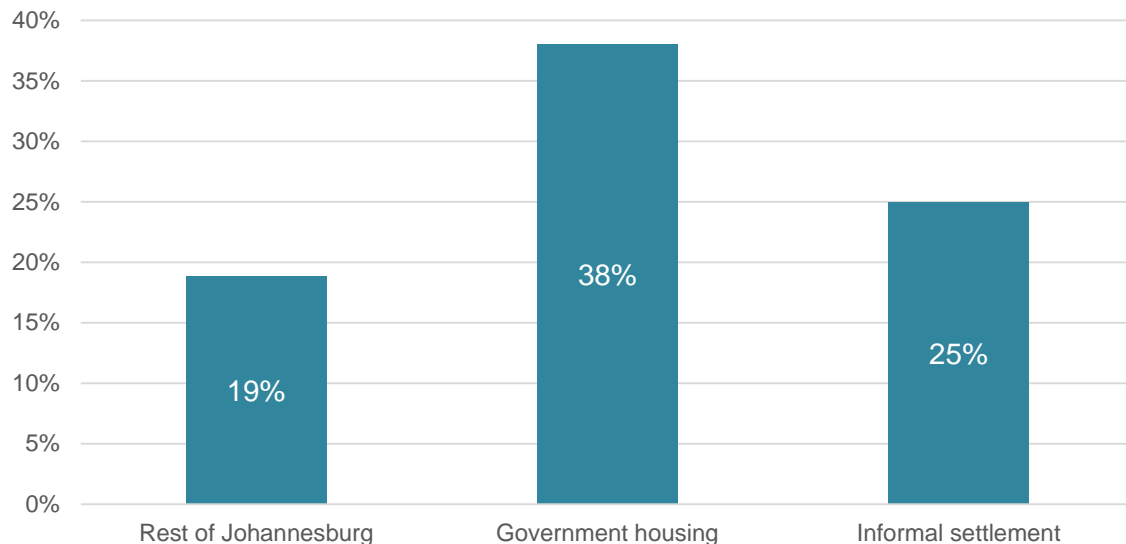
29%

Not applicable

5%

Electricity interruptions continued

Experience electricity interruptions twice a month or more

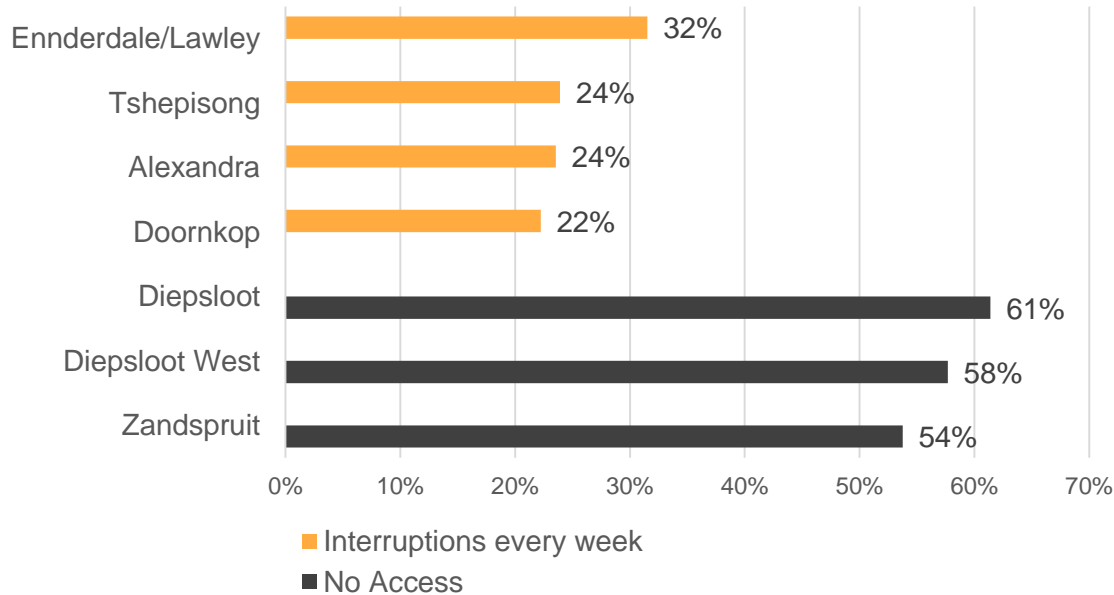


Comparing electricity interruptions by housing type it is very clear that **interruptions** (not running out of credit) **happen most frequently to people who live in government housing developments**, even more so than to residents of informal settlements.

Necessarily this calculation excludes people who do not have any access to electricity - which is a larger portion of informal dwellers than other housing types.

Where are the most crucial electricity interruptions?

% of ward reporting interruptions every week or no access to electricity



It is crucial for the City to **improve electricity supply** in these communities if we hope to **drive pro-poor development**, as well as possibly increasing revenue generation from energy sales.

It is also important that the City ensures that energy supply is reliable and energy costs are affordable for small businesses. These operators help drive economic development and might otherwise be forced to close down or be driven away if energy costs escalate.

Sustainable energy

“The major task here [sub-Saharan Africa] is the same as everywhere else: connection to the grid is just the beginning. Without a sizeable addition of reliable generation capacity, the lasting and powerful impact on people’s lives made possible by electrification won’t be achieved.

It is renewable energy sources, though, that will likely play the largest role in the future of electrification. Wind power and solar photovoltaics have become so readily available and cost-effective that they’re no longer an idealistic concept.” - Davis

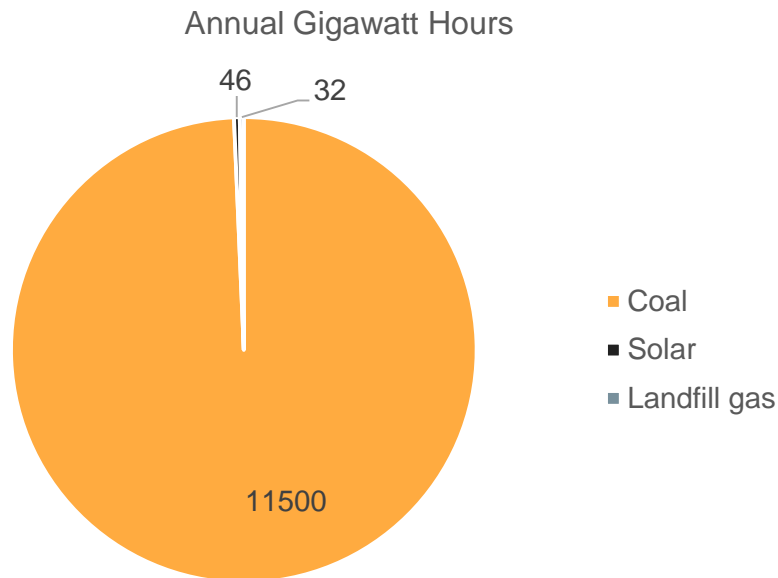
Furthermore renewable energy might well be a means of ensuring affordable access to electricity, particularly in the face of increasing Eskom tariffs.

Sustainable energy in CoJ

In moving towards a more sustainable energy mix City Power is pursuing solar, gas and landfill-to-gas generation systems as well as energy storage to complement the new energy sources.

The customer owned solar powered photovoltaic systems that have been authorized by City Power, generate an annual production of 46 GWh a year. The existing landfill gas generation sites, part of the REIPPP program, generate around 32 GWh per year.

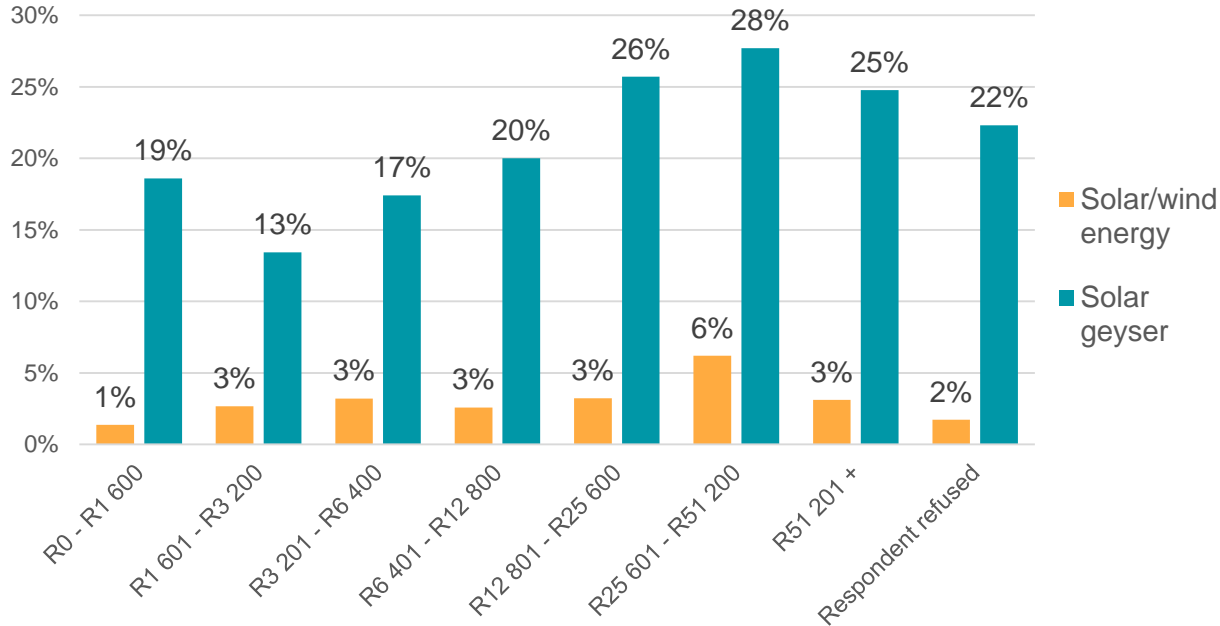
Presently, the current contribution of these sustainable energy sources to the mix is minimal however, the intent is to grow them in the coming decades. With 11 500 GWh sold annually, by far most of the City's energy is derived from coal.



² Information from City Power

Renewable energy and income

Solar/wind energy source and solar geyser within income groups



This graph shows that **higher income groups are slightly more likely to have sustainable energy sources.**

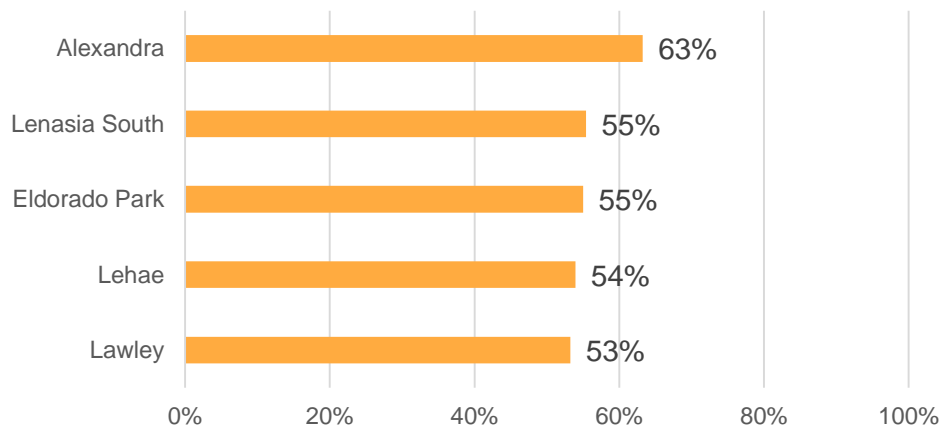
Households within the R25k-R51k/month bracket are most likely to have solar/wind energy sources. Remember too that this income bracket reported high satisfaction levels.

The implication of this is that elite households are more likely to reduce their spend on conventional electricity and move off grid, leaving the cost of maintain the grid to fall to lower income residents and driving up prepaid meter pricing.

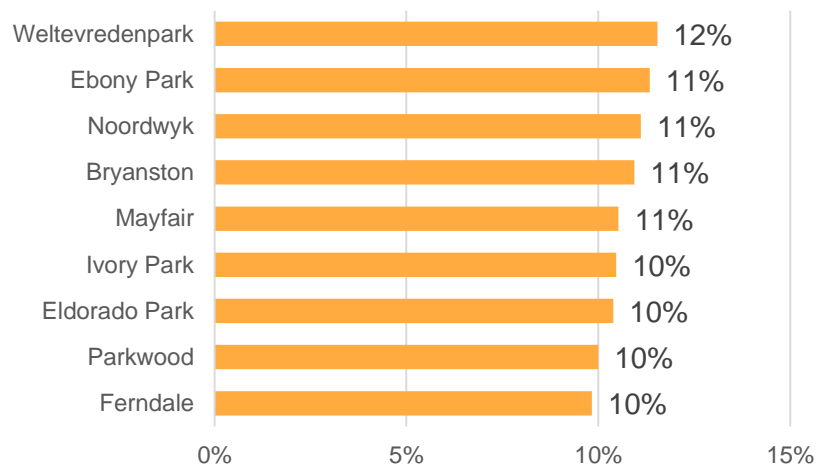
Renewable energy and income continued

However, sustainable energy sources are not limited to the elite. Proportionally the following wards are the top users of sustainable energy infrastructure. It is **evident that solar geysers have been successfully distributed to low income wards** through RDP style initiatives. Rolling out more sustainable energy sources, as well as energy storage units into communities, should help mitigate the energy crisis and counteract energy poverty.

% of ward that has a solar geyser
Top 5 suburbs



Wards where more than 10% of respondents have a solar or wind energy source



Conclusion

Access to energy is fundamental to improving quality of life and is a key imperative for economic development. Overall access to energy is good and 90% of Johannesburg residents have access to electricity.

However, some people who can access electricity choose not to use it because it is more expensive than alternative sources. Secondly, many residents suffer frequent energy interruptions. Improving residents' ability to access and use electricity is important for driving both pro-poor and economic development, as well as for improving health by reducing the use of polluting alternatives.

As people move out of poverty, their demand for electricity increases. However, these increases will likely be counteracted by increased electricity costs which will disproportionately affect the poor, especially as the energy crisis worsens. As a result, the poor will likely have to reduce their electricity usage. On the other end of the spectrum, as electricity costs increase, the commercial and business sectors who spend the most on electricity and subsidise household electricity costs, will be increasingly incentivised to shift to solar off grid technologies in turn impacting cross-subsidisation and reducing overall affordability of electricity.

Sustainable energy sources are not absent in low income wards and these technologies are becoming more and more affordable. Pursuing a carbon neutral design by rolling out more sustainable energy sources, particularly in government housing developments and informal settlements, investing in energy storage units for communities, and allowing renewable energy to be sold back to the grid should help mitigate the energy crisis and counteract energy poverty. This implies that the city needs to be proactive in investigating renewable sources as a cheaper way to secure electricity for the city than the Eskom grid.