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Lefapha la Disaense tša Ekonomi le Taolo

An analysis of residential sector energy consumption in South Africa

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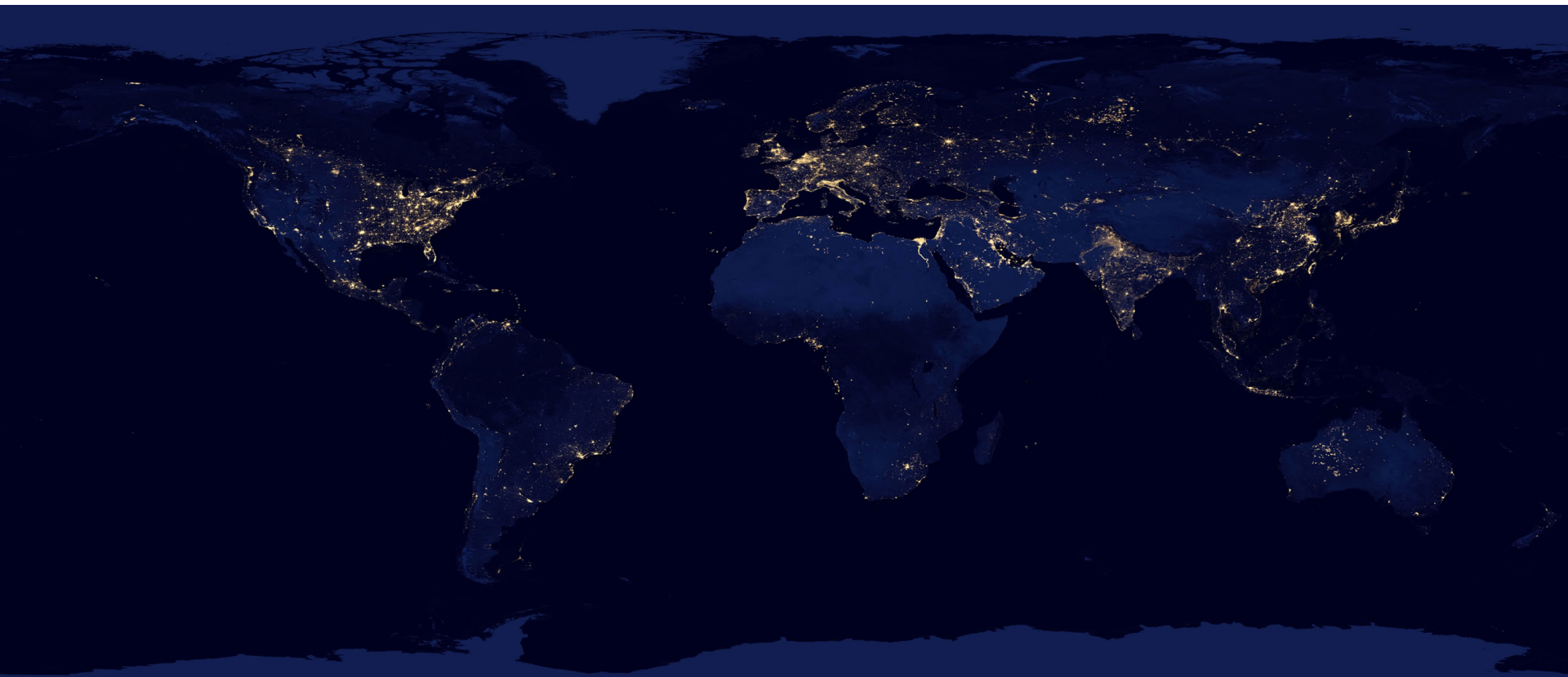


Outline

- Introduction
- Current research
- Residential energy consumption
- Progress in electrification
- Key energy consumption statistics
- Conclusions



Let there be light...



Introduction

My research aims to: *find the most effective suite of policies to reduce GHG emissions in South Africa while taking into consideration its effects on different households*

- 1) **Understand household's electricity/energy consumption patterns;**
- 2) Understand South Africa's CO₂ emissions profile;
- 3) Analyse the current and future-planned energy mix in South Africa;
- 4) Evaluate different policy scenarios

Current Research

This paper focuses in analysing and understanding the South African residential sector energy characteristics

- Focusing on the evolution of energy consumption;
- The behaviour of households in using energy for cooking, lighting and eating.

Based on:

- GHS Series Volume V Energy 2002-2012: In depth analysis of the General Household Survey data; and
- Survey of Energy Related Behaviour and Perceptions 2013.

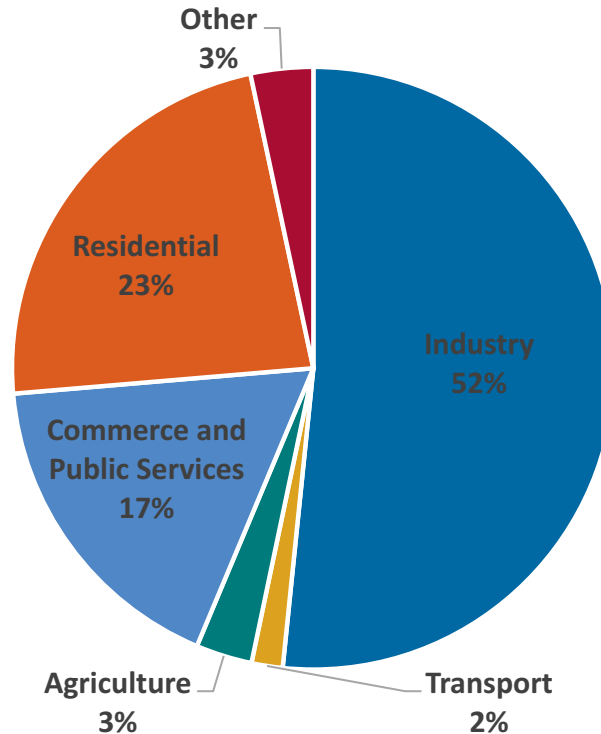


Residential Energy Consumption

- As defined by the U.S Energy Information Administration, *energy consumption* in the residential sector includes all energy consumed by households excluding transportation uses.
- Residential energy consumption includes energy consumed by households for heating, cooling, lighting and water heating.
- Factors such as income levels, energy prices, building and households characteristics, occupant behaviour, weather, energy access, appliances and its energy efficiency, availability of energy sources and energy related prices significantly influence the amount of energy consumed in the residential sector.



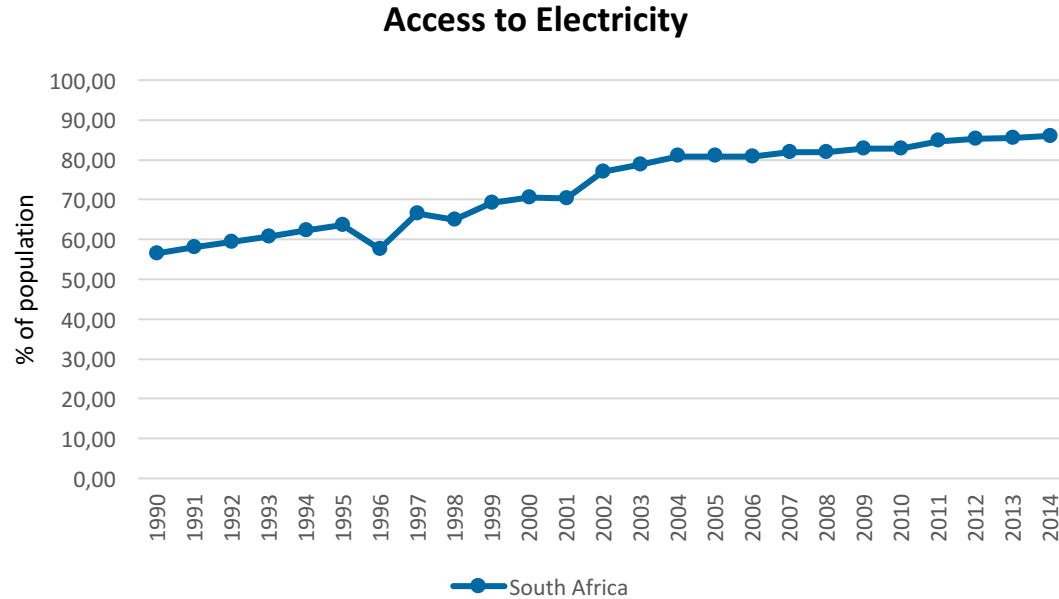
South African Electricity Consumption



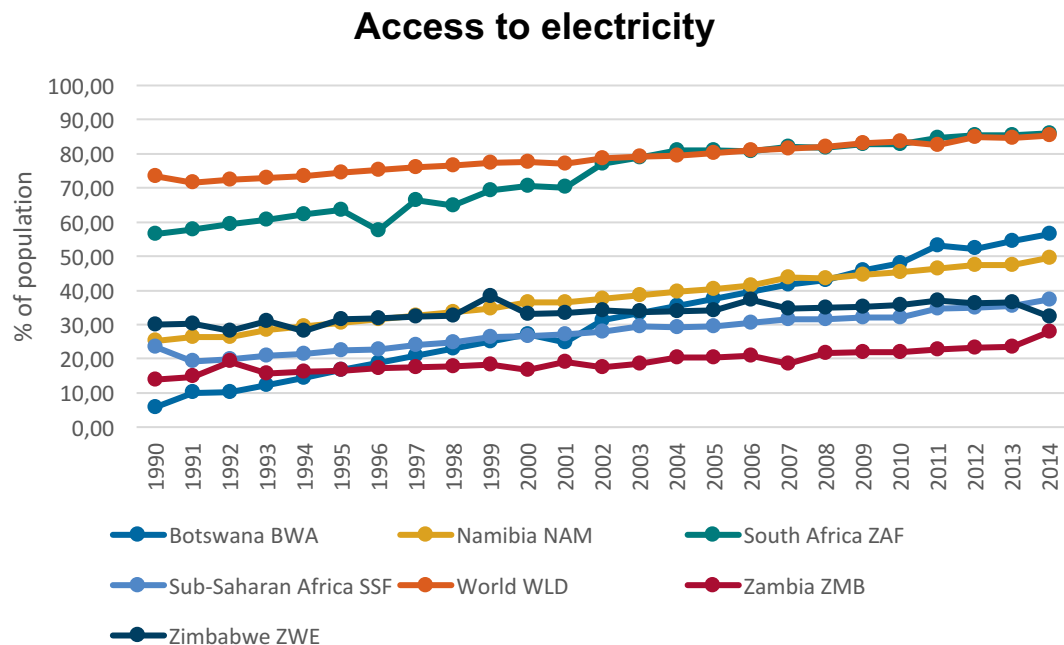
National Electrification Statistics

| Year | Number of Households | Houses without electricity | Houses Electrified | Access to electricity |
|---|----------------------|----------------------------|--------------------|-----------------------|
| 2010 | 12 860 165,00 | 3 440 699,00 | 9 419 466,00 | 74,90 |
| 2011 | 13 038 317,33 | 3 421 094,40 | 9 617 222,93 | 73,76 |
| 2012 | 13 230 800,00 | 3 421 664,00 | 9 809 136,00 | 74,14 |
| 2013 | 14 739 165,00 | 2 167 741,00 | 12 571 424,00 | 85,29 |
| 2014 | - | - | - | - |
| 2015 | - | - | - | - |
| 2016 | 15 641 320,00 | 2 171 902,00 | 13 469 418,00 | 86,11 |
| <i>Source: Department of Energy, South Africa</i> | | | | |

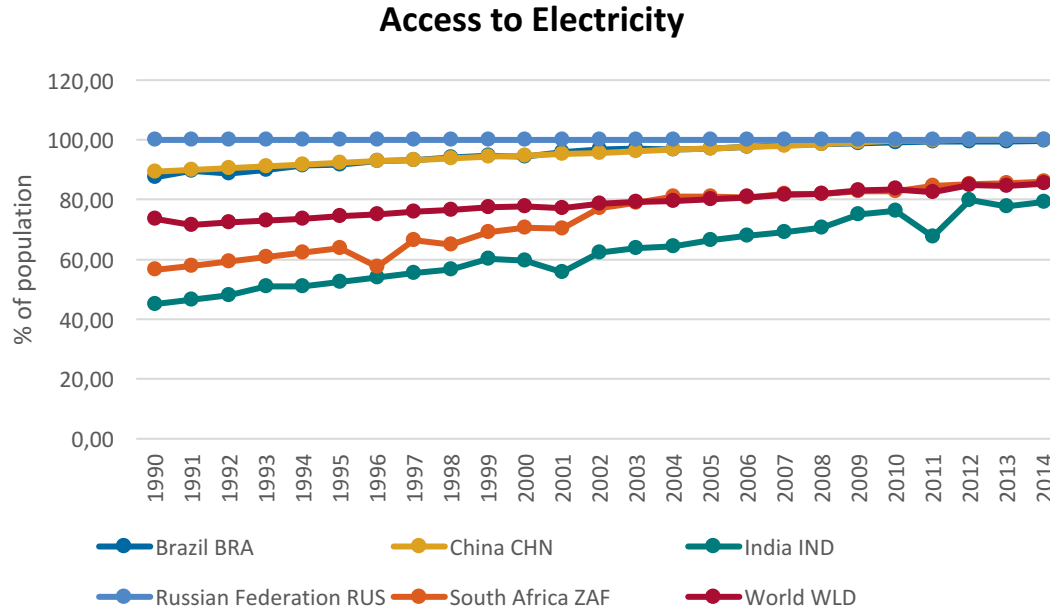
National Electrification Statistics



Access to Electricity – Neighbouring Countries



Access to Electricity – BRICS



Key Energy Consumption Statistics (1)

- Households without access to electricity, or who cannot afford it, use multiple sources of energy such as wood and paraffin to satisfy their basic needs – leads to health and environmental effects.
- The use of solid fuels (biomass) is prevalent in rural areas where more than three-quarters of households without access to electricity use these fuels for cooking, heating and lighting



Key Energy Consumption Statistics (2)

- Households in the bottom income decile spent 3,6% of their income on electricity compared to richer households that spent 1,8% of their income
- For poorer households living in RDP-type dwellings expenditure on electricity often exceeds 20% of their income
- Less than 10% of poor households' consumption of energy goes towards lighting, with the remainder spent on cooking and space heating

Why is this important?

- Electrification is growing but by 2040 there will still be millions of people with no access to reliable electricity to meet their basic needs
- Household consumption of electricity is not homogenous across income groups
- Can we achieve the triple dividend of increasing economic growth and reducing poverty whilst mitigating GHG emissions?
- This poses significant challenges for policy makers

Conclusion

- This paper, which focuses on the residential side of electricity demand, is one part of a multidimensional study of energy and environmental policy in South Africa
- Required to design a tailored policy response aimed at generating a triple dividend

Thank you

Suggestions, questions and comments are welcome

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