



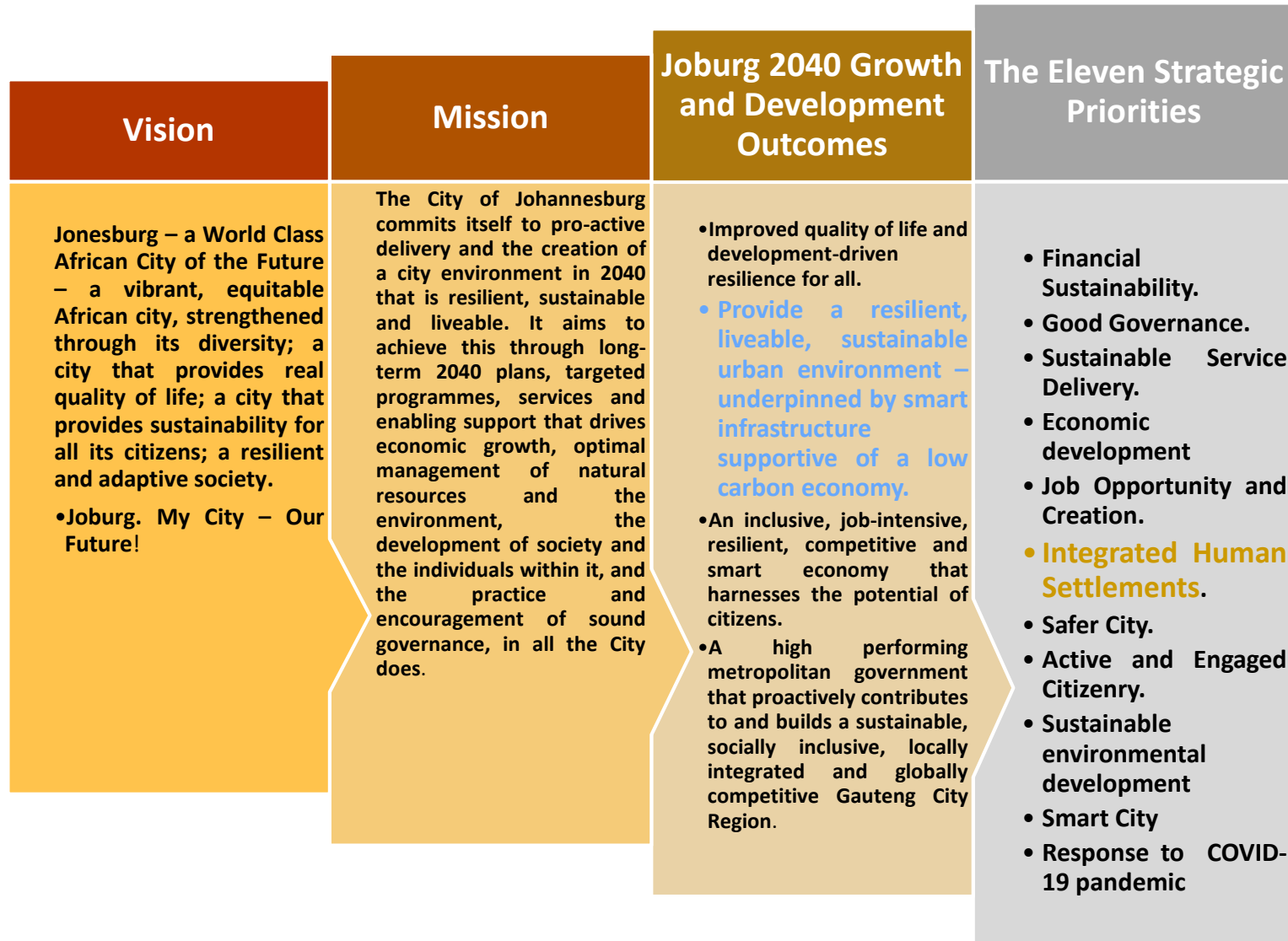
## Vision

*World Class African City*

## Mission

*To proactively deliver and create a City environment in 2040 that is resilient, sustainable and liveable. We will collectively enable support that drives economic growth, optimal management of our natural resources and the environment and we will develop an inclusive society that contributes the development of a capable and developmental local government.*

# Vision and Mission Align with Strategic Priorities



# Joburg Population

## Population Pyramid, City of Johannesburg:

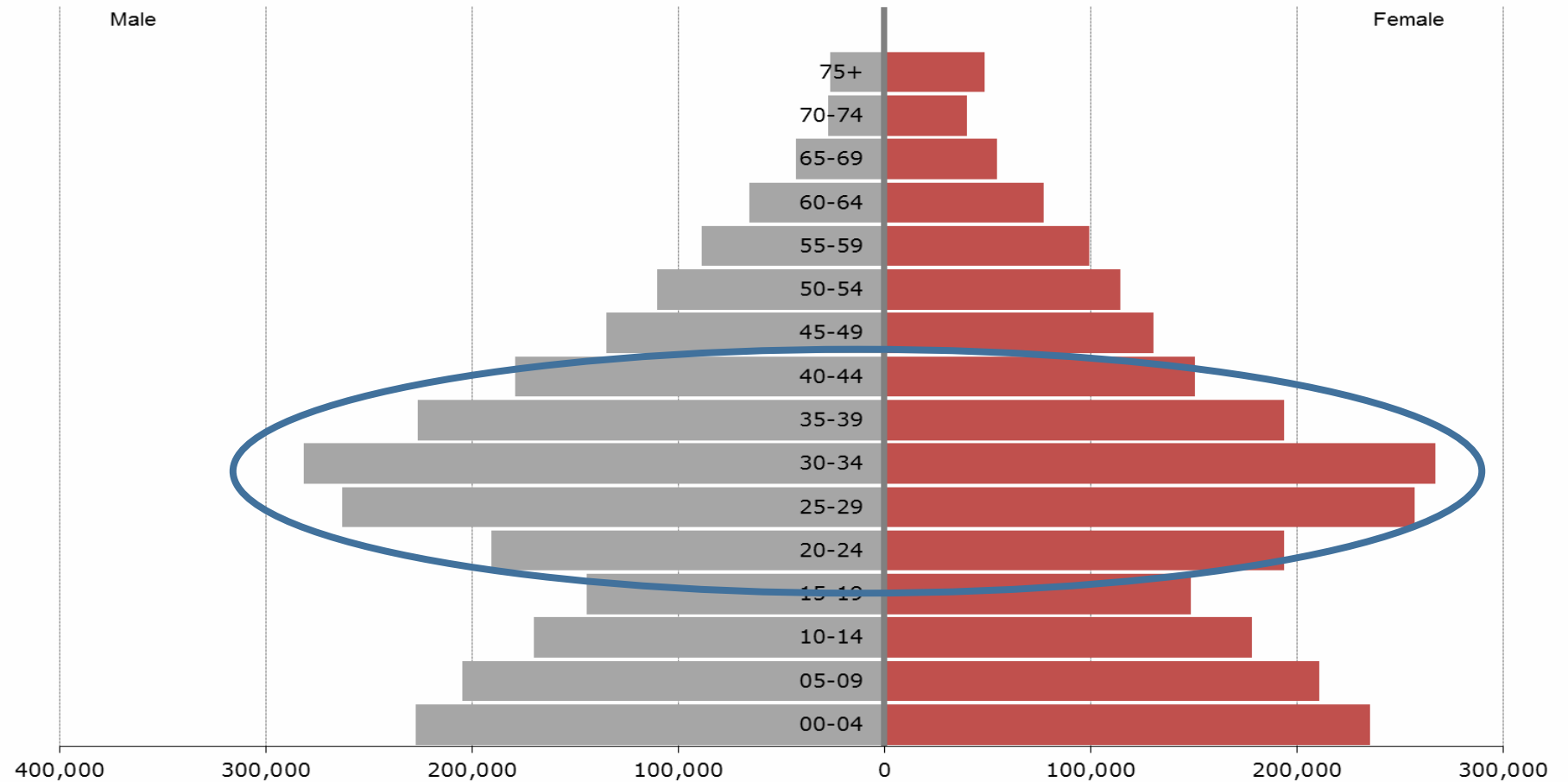
### Population projections

- 2016: 4, 86
- 2017: 4,96
- 2018: 5,07
- 2019: 5,18
- 2020: 5,30
- 2021: 5,42

### Household projections

- 2016: 1,80
- 2017: 1,87
- 2018: 1,94
- 2019: 2,01
- 2020: 2,08
- 2021: 2,15

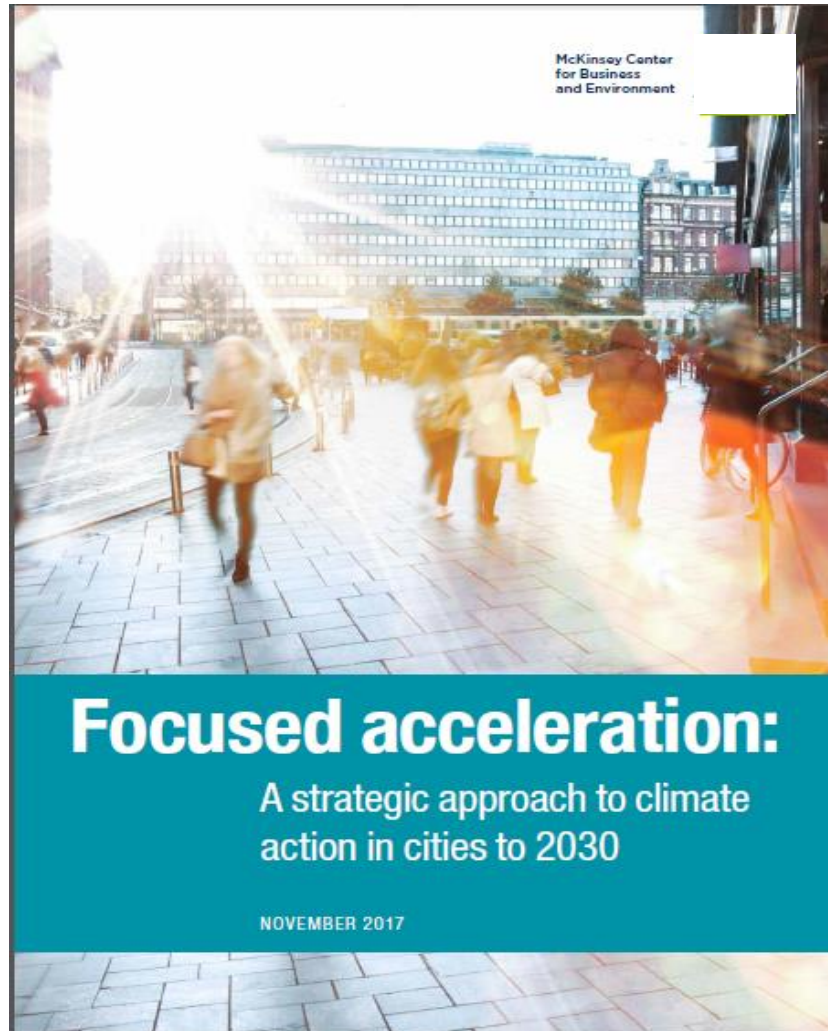
Average household size will decrease to less than 3 persons per household.



Source: Global Insight Regional eXplorer : 2015



## Focused acceleration areas



CHAPTER 2.1:

**Decarbonizing the electricity grid**



CHAPTER 2.2

**Optimizing energy efficiency in buildings**



CHAPTER 2.3

**Enabling next-generation mobility**



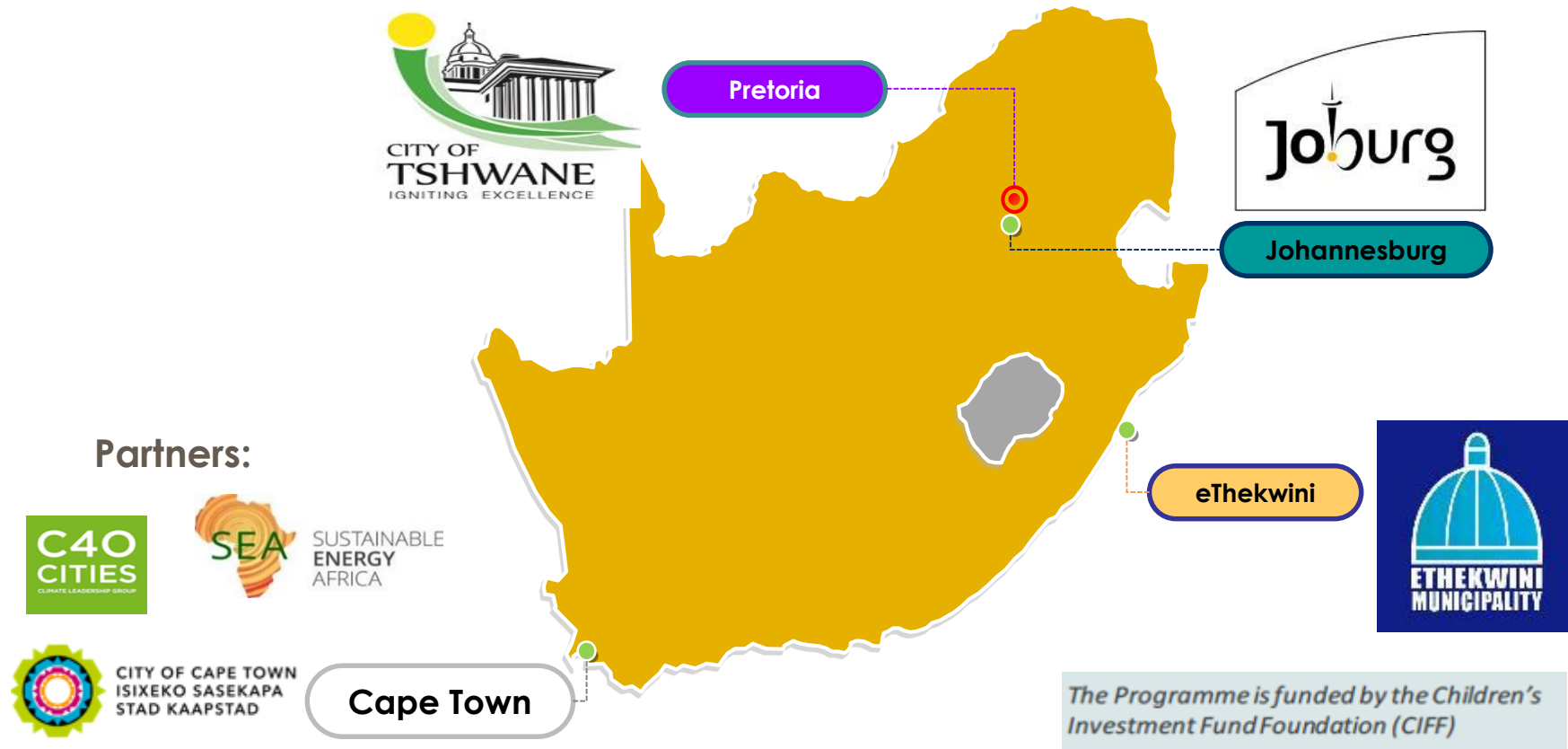
CHAPTER 2.4

**Improving waste management**



# SA Buildings Programme

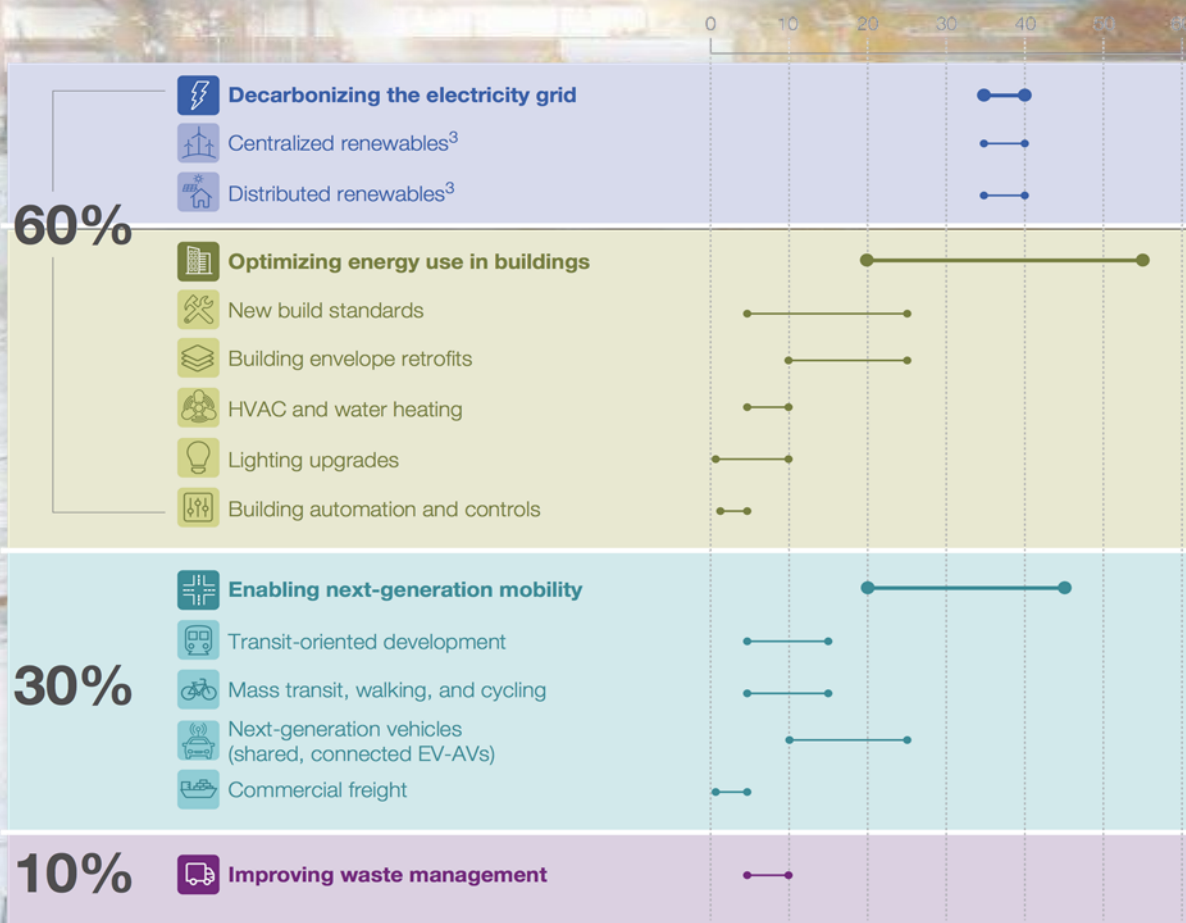
**STRATEGIC OBJECTIVE:** To accelerate the development and implementation of transformational energy efficiency policies and programmes for new buildings in South African cities by 2020, working towards net zero carbon performance, and sharing the lessons widely across C40 city networks.



# Focused acceleration areas

Approximate share of C40 cities emissions      Opportunity

Average range of 2030 emissions reduction potential across city types,<sup>1</sup> % of 2030 target<sup>2</sup>



**12 key opportunities could deliver 90-100% of necessary emission reductions**



# So what should we do?

1

Make new buildings efficient from the start



2

Retrofit existing buildings for efficiency



3

Clean up the energy used by buildings to install solar panels







- Set clear energy reduction targets to improve building performance across the city.
- Develop trajectories and/or roadmaps outlining key actions and milestones to be achieved
- Measure and disclose energy demand and carbon emissions.
- Measure performance of departments with respect to achieving the targets.



Engage various stakeholders to promote carbon zero development. This can be through competitions and awards, user-feedback and behavioural energy management activities.



Enact building energy codes and standards that stipulate minimum levels of energy efficiency in design, construction and/or everyday operation of buildings to ensure all new buildings operate at net zero carbon by 2030.



Demonstrate leadership to support the transition to net zero carbon buildings by committing to developing and/or occupying net zero carbon buildings, undertaking public building retrofits, lighting upgrades, innovative and sustainable procurement and supporting activities that lead to improved building efficiency.



- Develop a range of supporting incentives to help the private sector to develop, manage and occupy net zero carbon buildings.
- Facilitate strategic investments in building efficiency in partnership with national and private sector financial institutions to help overcome inertia and spur new investment in buildings.
- Develop innovative funding mechanisms and financing models to help cover upfront costs can spark greater investment.



# Building bylaw

**Action: Building efficiency codes and standards**

**What is it?** Regulatory tool that requires that all new buildings are carbon neutral.

**Objective:** provide mandatory guidance to optimize the design and construction of buildings and building services such as heating, cooling, ventilation, and lighting



**Status:** preliminary engagement with stakeholders

## Proposed next steps

- Bylaw initiation and development

## Risks:

- Political buy-in
- Going above national building regulations
- Enforcement
- Shifting development outside city

## Resources:

- Internal capacity
- City departments – Development Planning, Group Strategy, EISD, Legal, Housing, etc.
- External support– City of Tshwane, City of Cape Town, eThekweni Municipality, Sustainable Energy Africa, Green Building Council of South Africa
- Budget?



# SA Buildings Programme







Inner City  
Building  
Programme



Retrofit  
Municipal  
Buildings

City  
leads



City-owned  
development:  
Green  
Procurement  
& Regulations



Housing  
delivery

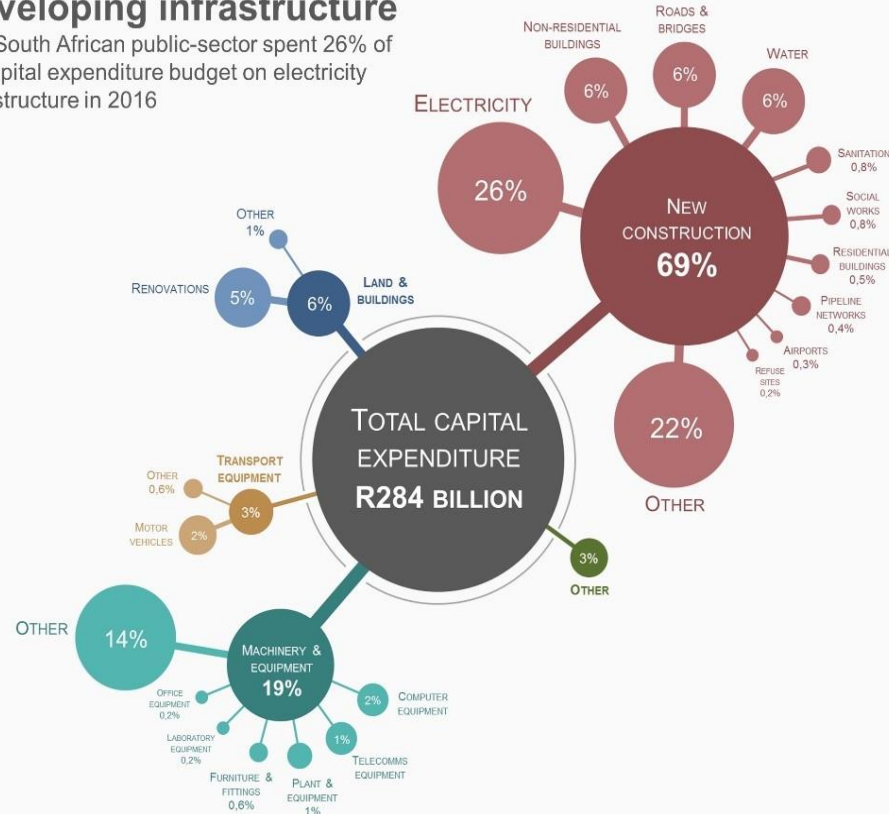


# The Challenge at hand

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## Developing infrastructure

The South African public-sector spent 26% of its capital expenditure budget on electricity infrastructure in 2016



Percentages have been rounded and may not sum to 100% Source: Capital expenditure by the public-sector for 2016 <http://www.statssa.gov.za>

Whilst the country encourages the use of alternate energy, there is a big shift that is required to ensure the alternative energy source initiatives are encouraged and viewed at the same light as electricity

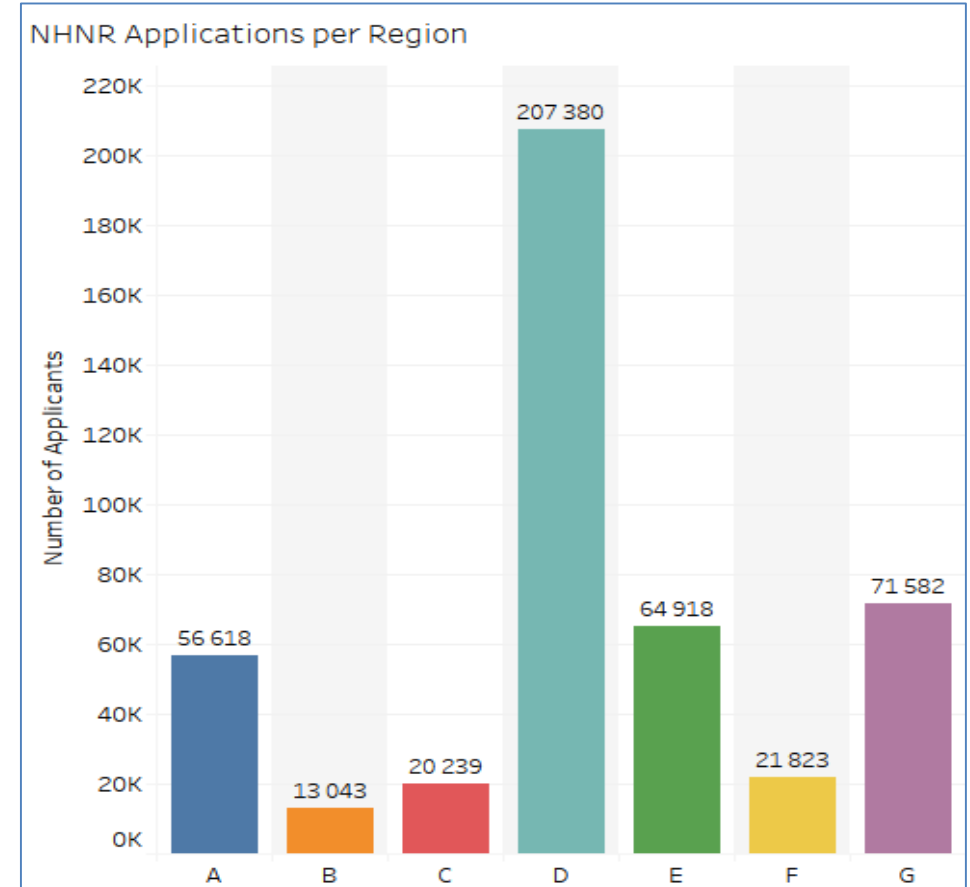
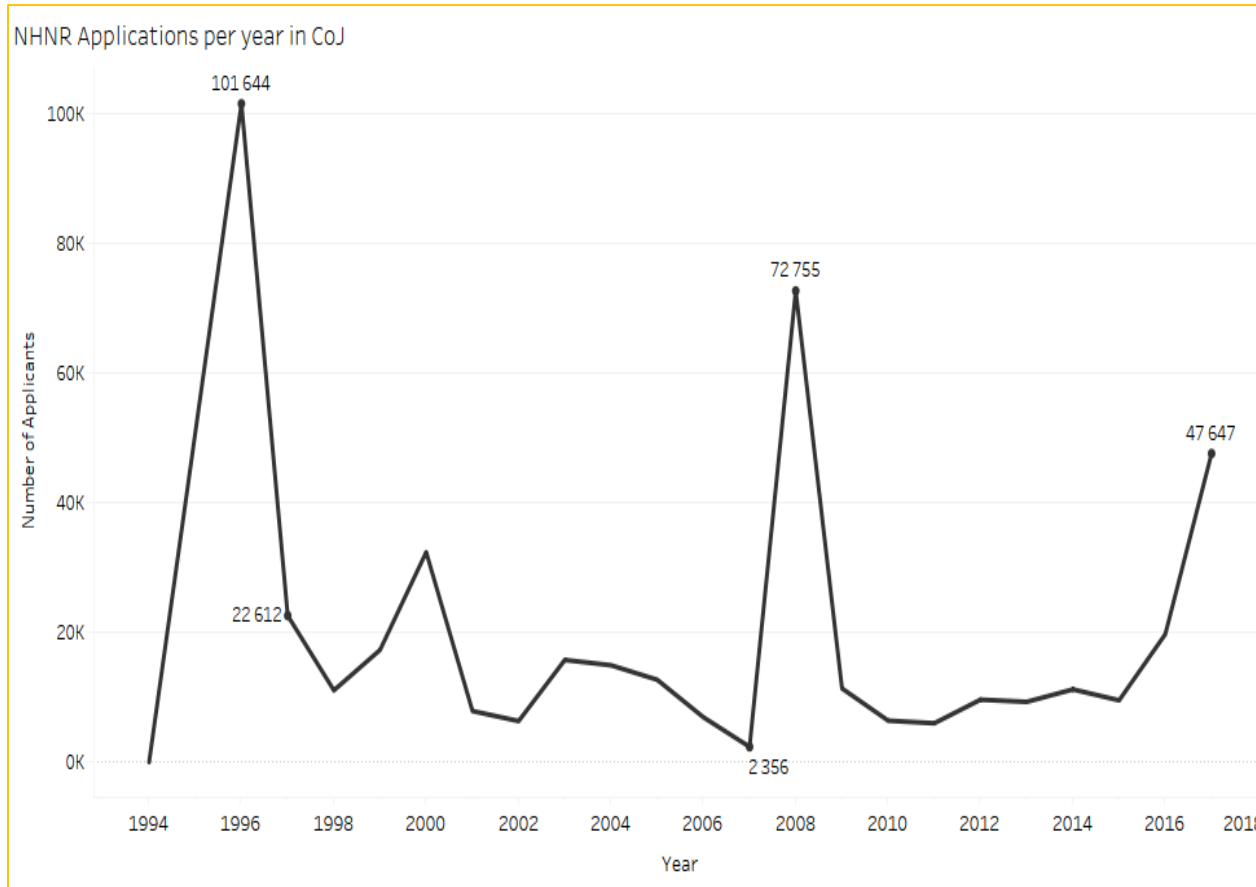
- The five large metros dominate the national economy, among them, the three Gauteng metros account for almost a third (32 per cent in 2016) of national output.
- Gauteng is by far the most important geographical concentration of economic activity and increasingly operates as a single functional region (OECD, 2011)
- Total electricity generated and delivered, as per table 9 below shows the largest proportion of delivery for Gauteng , with an overall 2.7% year on year increase for 2020.
- This depicts the biggest reliance on electricity connections for the Province , with the three metros expected to the highest consumers of electricity.
- The infrastructure expenditure in 2016 also saw a 26% allocation towards electricity infrastructure , showing an increased investment into electricity as a main source of energy supply in the country.
- This demonstrates the role in which electricity is viewed and regarded as the main supply for the country, which causes a challenge for the future.

**Table 9 – Volume of electricity delivered to provinces (gigawatt-hours)**

Province	Apr-20	May-20	Jun-20	Jul-20	Aug-20 <sup>1</sup>	Aug-20 year-on-year % change
Western Cape	1 464	1 621	1 661	1 732	1 761	-10,2
Eastern Cape	587	691	721	768	781	-1,5
Northern Cape	378	466	504	521	517	-0,4
Free State	748	902	969	1 028	1 018	2,5
KwaZulu-Natal	2 854	3 198	3 378	3 541	3 488	0,2
North West	824	1 221	1 331	1 450	1 393	-2,7
Gauteng	3 857	4 782	5 486	5 756	5 373	2,7
Mpumalanga	2 221	2 460	2 620	2 693	2 638	-1,1
Limpopo	1 189	1 566	1 618	1 678	1 677	2,7
<b>Total</b>	<b>14 122</b>	<b>16 907</b>	<b>18 288</b>	<b>19 167</b>	<b>18 645</b>	<b>-0,4</b>

<sup>1</sup> Preliminary.

# Situational Analysis: Demand side trends (National Housing Needs Register)



The housing demand continues to increase. The demand also means the increased infrastructure demand especially in areas where there is an increased delivery. The **energy issue** is more critical for households

# Energy efficient Contextual



An energy efficient home can be described as a home that uses less energy and in turn emits less carbon which becomes a benefit for the environment , but its also a social benefit



With the power challenges that is faced by the power utility in the country , there is a need to encourage more energy efficient use of alternative energy to decrease the demand



Living standards can be enhanced by reducing the electricity usage and hence the shortfall of energy for all homes in South Africa.



The urgency of the electricity shortage was realised in 2007/8 when South Africa started experiencing the power shock of widespread rolling blackouts as the supply fell behind the demand.



This has led to energy poverty and continuous rising energy costs.



Human Settlements has through NHBRC leading initiatives started exploring various ways in which it can intensively contribute to energy efficient measures in its developments.



The Department is exploring not only energy efficient methods, it also looks at various ways in which it can reduce costs of building and use of building methods through alternative building systems



# Alternative building methods initiatives

## TRA planned developments



- Value for money, reduces building time, site standing time, labour costs, etc
- Easy to maintain
- Technical efficiency, absorbs more heat in winter days and cools off in summer
- Insulation of containers , to ensure units retain heat and reduce required energy for heating





# Award winning Project-Energy efficient initiatives



South hill development comprises of a mix of fully-subsided homes, subsidised rental units, bonded units to the open market and free-stranding houses. South Hills is situated along a transport node, offering residents easy access to transport, job opportunities, and local amenities, including shops and hospitals. Over 90% of the units fall within the Financial Sector Charter definition of affordable housing.

The development addresses energy-efficiency, creating healthier living environments and reducing long-term energy costs for owners and tenants,

Units make use of gas, solar and solar farming, heat pumps, induction geyser, energy saving lights and prepaid meters for both electricity and water

Calgro M3 has implemented a device called "Save a Flush" by Dry Planet SA. Placed in a toilet, the device reduces water consumption per flush by one litre.

Calculations, verified by an independent external party, shows that, based on the construction of a 40m2 residential unit and 11 flushes per day, the group will be rendered "water neutral" for each unit it develops within just 84 days of being occupied.

While energy- and water-efficient affordable housing still has a long way to go, but these initiatives may reduce costs to owners

# The Challenges faced with electricity supply shortages

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Electricity demand vs  
available infrastructure for  
additional area demand

Units completed  
unallocated due to  
additional electrical  
infrastructure required to  
connect households

Unallocated Housing attract  
illegal invasion of units

Unless various energy  
sources are explored, these  
challenges is likely to  
continue in the future





# CURRENT DEVELOPMENT

Riverside Mega Development



Fleurhof Mega Development



Lehae Mega Development



Lufhereng Mega Development



## Current housing developments

### Energy efficient features

- Gas Geysers
- Solar Geysers
- Gas Stoves
- North facing Housing to allow sunlight

## FUTURE DEVELOPMENT

### Goudrand Mega Development

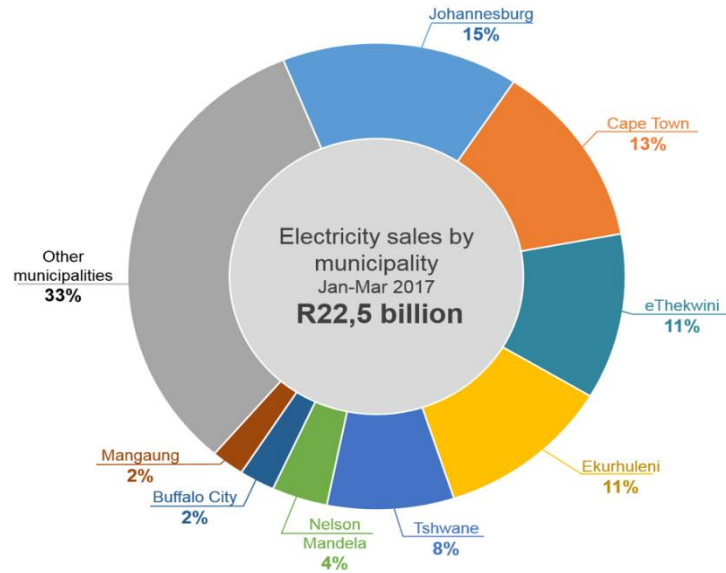
#### Energy efficient features

- North Facing housing to allow sunlight
- Gas stoves
- Solar Geysers

# A balanced View

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Which municipalities sell the most electricity?

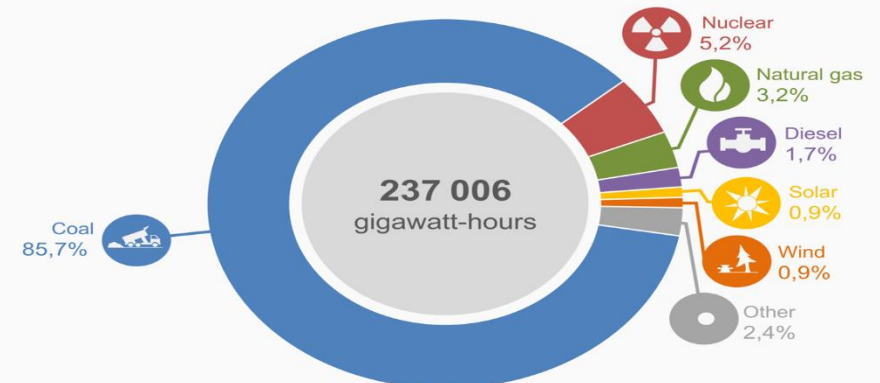


Source: Quarterly financial statistics of municipalities, March 2017

- Government's recent renewable energy agreements with independent power producers (IPPs), indicates a move to more clean energy
- However, the Country & City is likely to keep the energy mix over time.
- Municipality still rely on electricity sales for income, employment contribution of electricity is still vast

- The dominance in coal as a source of energy is a hard dominance to move away from for south Africa,
- This is because coal is cheap, and undantky available.
- The mineral also contributes to economic growth, in 2018, coal surpassed gold as a contributor to GDP.
- Data shows a shift on coal's dominance and an increase in solar and wind power.
- According to Stats SA, Coal generated 88,3% (or 215 691 GWh) of South Africa's electricity supply in 2013, falling to the previously mentioned 85,7% (or 203 054 GWh) in 2016.

Coal remains South Africa's dominant source of energy  
Total electricity generated by source, 2016



Excludes municipalities and enterprises that distribute liquefied petroleum gas (LPG) Source: Electricity, gas and water supply industry, 2016 (Table 11)





# THANK YOU

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