City of Cape Town
New Urban Agenda

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Sustainable Energy Markets
17 October 2017
Presentation Outline

- Integrated Development Plan
- Cape Town Energy 2040 Vision
- Energy in Electricity
- Energy in Transport
- Challenges faced
Integrated Development Plan

1. Positioning Cape Town as a forward-looking, globally competitive city
2. Leveraging technology for progress
3. Economic inclusion
4. Resource efficiency and security
5. Safe communities
6. Excellence in basic service delivery
7. Mainstreaming basic service delivery to informal settlements and backyard dwellers
8. Dense and transit-oriented growth and development
9. An efficient, integrated transport system
10. Building integrated communities
11. Operational sustainability
Cape Town Energy 2040

**ENERGY2040 ENERGY DEMAND & SUPPLY**

- Business-as-usual
- Electricity efficiency
- Transport efficiency
- Solar
- Gas/other cleaner sources
- Coal
- LPG & Heavy furnace oil
- Diesel
- Paraffin
- Jet fuel
- Petrol

**CARBON EMISSIONS TARGETS**

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity efficiency</td>
<td>-3,7%</td>
<td>-7,7%</td>
<td>-9,3%</td>
</tr>
<tr>
<td>Transport efficiency</td>
<td>-3,2%</td>
<td>-7,2%</td>
<td>-11,2%</td>
</tr>
<tr>
<td>Cleaner electricity supply</td>
<td>-6,2%</td>
<td>-13,9%</td>
<td>-15,9%</td>
</tr>
<tr>
<td>Total carbon reduction off business-as-usual</td>
<td>-13%</td>
<td>-29%</td>
<td>-37%</td>
</tr>
</tbody>
</table>

**ENERGY2040 CARBON EMISSIONS**

- Business-as-usual
- Electricity efficiency
- Transport efficiency
- Local generation & embedded solar PV
- Peak plateau decline “required by science”

**Tonnes of CO₂/USD million GDP**

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonnes of CO₂/capita</td>
<td>5,4</td>
<td>5,3</td>
<td>-</td>
</tr>
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</table>

*The energy and carbon emissions targets are conditional on the Energy2040 modelling assumptions remaining constant.*
Energy: Electricity

- City procures power mainly from Eskom (1.8 GW of capacity mainly coal)
- Approximately 3.6% of the Eskom power procured is from Renewable Energy Resources
- Largest uptake of renewable is in Solar PV installations
  - Rising electricity prices
  - Lower PV costs
- IPP procurement process is fraught with regulatory and policy issues
  - Clarity required for large scale renewable energy procurement
Energy Efficiency

- Energy efficiency initiatives implemented in many buildings & facilities
- Replaced street lighting and traffic lights
- Smart meters being installed
- Strategy to rollout to other departments (solid waste, waste water, etc.)
- Promotion, awareness and education in private sector
- Rollout of Solar Water heating and heat pumps through accredited installers
- Low Income energy services
Renewable Energy

Solar
- Independent Power Producers
- Small Scale Embedded Generation
- City Owned PV

- Hydro
  - Micro-hydro’s at waste water plants

- Wind
  - Darling wind farm
Waste to Energy

**Waste Water**
- Primary sludge waste is treated in bio-digesters
- Planned installation of CHP plant (1.7MW)
- Key water sites are being assessed
- Solar PV installation feasibility assessments

**Solid Waste**

<table>
<thead>
<tr>
<th>Description</th>
<th>Status</th>
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<tbody>
<tr>
<td>Rehabilitation of Atlantis, Vissershok, Waterkloof and Witsand landfill sites</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Landfill gas infrastructure for flaring at Coastal Park landfill</td>
<td>Commencing in 2017</td>
</tr>
<tr>
<td>Landfill gas infrastructure for flaring at Bellville landfill</td>
<td>Commencing in 2017</td>
</tr>
<tr>
<td>Landfill gas infrastructure for flaring at Vissershok landfill</td>
<td>Commencing in 2020</td>
</tr>
<tr>
<td>Design and development of materials recovery facility: Helderberg</td>
<td>Commencing in 2017</td>
</tr>
<tr>
<td>Design and development of integrated waste management facility in Helderberg</td>
<td>From 2018 to 2020</td>
</tr>
</tbody>
</table>
Energy 2040

- 2017
  - Low carbon
  - Energy Security
  - Resource Efficiency
  - Revenue Protection
  - Job Creation

2020 (IDP 2017)
- 120 MW SSEG
- 100MW RE
- 300 MW Gas / Clean Energy
## Approach to achieving target

<table>
<thead>
<tr>
<th>Roles</th>
<th>Business Model</th>
<th>Modalities</th>
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</thead>
<tbody>
<tr>
<td>Building Generation Capacity</td>
<td>Building embedded power systems (e.g. installing rooftop solar PV systems on municipal buildings with or without feeding into the municipal grid)</td>
<td>Financing through the municipality’s balance sheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financing through debt</td>
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<tr>
<td></td>
<td></td>
<td>Financing through grants</td>
</tr>
<tr>
<td></td>
<td>Building stand-alone power plants (e.g. building solar park on municipal land used for municipal grid or own use)</td>
<td>Financing through debt/grants</td>
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<td>Entering into a public-private partnership (PPP)</td>
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<td>Sign a Build-Operate-(Own)-Transfer agreement</td>
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<tr>
<td></td>
<td></td>
<td>Set up a special purpose vehicle with other municipalities / partners</td>
</tr>
<tr>
<td>Procuring Energy</td>
<td>Procuring electricity from embedded generators (e.g. procuring electricity from rooftop PV systems installed by residential customers)</td>
<td>Purchase based on feed-in tariff / net metering / net billing</td>
</tr>
<tr>
<td></td>
<td>Procuring electricity from an independent power producer (e.g. procuring electricity from an independent solar park)</td>
<td>Purchase based on a power purchase agreement (PPA)</td>
</tr>
<tr>
<td>Facilitation Role</td>
<td>Playing a trading/aggregating role (e.g. buying electricity from local producers for on-selling to willing customers at a premium)</td>
<td>Billing through the electricity tariff (with potential premium)</td>
</tr>
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</table>
Energy: Transport

**Carbon Emissions by Sector**

- Transport: 34%
- Commercial: 26%
- Residential: 22%
- Industrial: 10%
- Local Government: 10%

Electricity is carbon heavy in South Africa.

**Transport Sector Energy Consumption**

- Commercial & Industrial: 19%
- Passenger: 81%

**Passenger Transport Energy Consumption**

- Public Incl. minibus taxis: 9%
- Private: 91%

46% of households own 1 or more cars.
Reducing the transport footprint

- **Transit Orientated development**
  - Strategy in place
  - Extend coverage of public transport
  - New economic development zones

- **E-Mobility**
  - Development of EV framework
  - Include EV’s in fleet
  - Work on developing infrastructure
  - Electric bus fleet rollout in 2018 (PV for charging)
  - Improve bicycle lanes
  - Electric bikes, scooters
Challenges faced by City of Cape Town

- Drought crisis
- Regulatory challenges
- Internal resources
- Revenue risk
- Technical risks
- Socio-economic development
Thank You

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Making progress possible. Together.