



a world class African city



The role of waste in the transition to low carbon economy: Joburg context

**Presentation: National Climate Change Response Dialogue
10-13 November 2014**

National Climate Change Response Policy

South Africa's climate change mitigation objectives:

- To make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.
- NCCCRP advocates for a sectorial approach namely:
 - ❑ Energy,
 - ❑ Industry,
 - ❑ Transport,
 - ❑ Waste and Agriculture Forestry and Other Land Use (AFOLU)

Focus today will be on the Waste Sector at City of Johannesburg

Waste Sector Contribution to Greenhouse Gas Emissions



Waste Sector Contribution to Greenhouse Gas Emissions

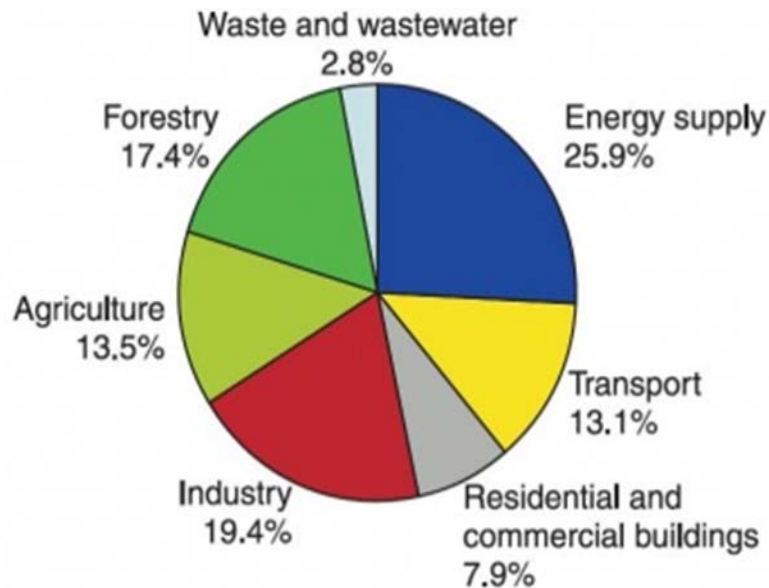
- Short-Lived Climate Pollutants (SLCPs) are agents that have relatively short lifetime in the atmosphere – a few days to a few decades – and a warming influence on climate.
- The main short-lived climate pollutants are black carbon, methane and tropospheric ozone
- These short-lived climate pollutants are also dangerous air pollutants, with various detrimental impacts on human health, agriculture and ecosystems. (UNEP 2011)

Waste Sector Contribution to Greenhouse Gas Emissions, cont...

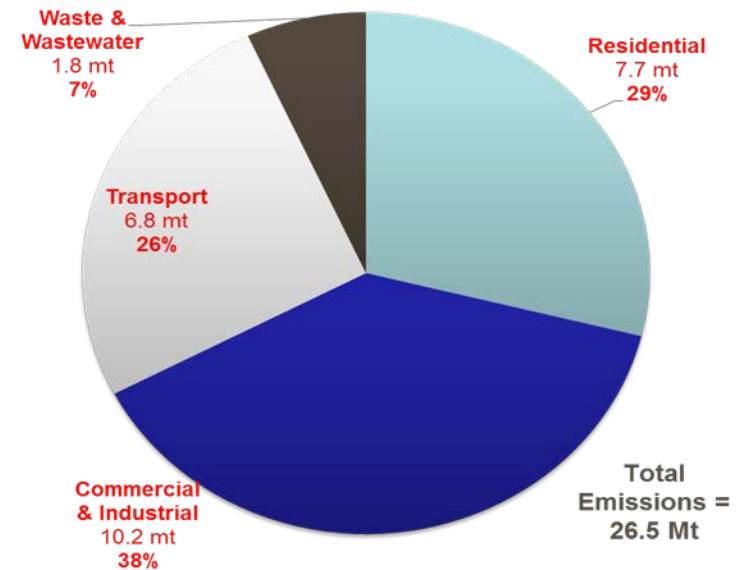
- SLCPs account for approximately 40-45% of present climate forcing.
- Reducing SLCPs has the potential to avoid the rise in 0.5°C global warming by 2050 and 0.7°C in the Arctic by 2040, which can cut the rate of global warming by half,
- Municipal solid waste, including landfills, is the third largest source of anthropogenic methane emissions globally,
- Municipal solid waste is also a significant source of black carbon, as well as carbon dioxide, from open burning and waste transport, creating serious air pollution in cities. (UNEP 2011)

Waste Sector Contribution to Greenhouse Gas Emissions

National contribution per sector



CoJ contribution per sector



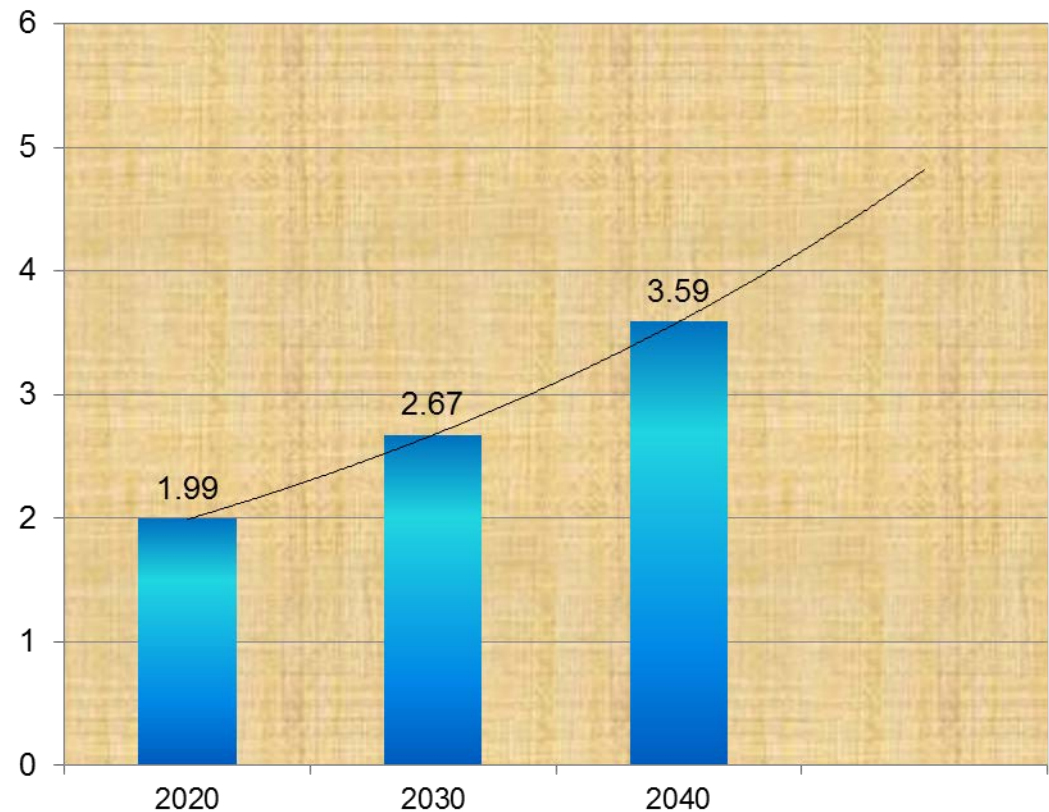
CoJs Initiatives to move towards a low carbon economy

Projected waste disposal volumes

Waste disposed: 1.6 million tonnes/ year

- Projected annual waste disposal growth rate: 3.6%
- Forecast waste disposal by 2020 1.99 million tons/year
- Forecast waste disposal by 2030: 2.7 million tons/year
- Forecast waste disposal by 2040 3.6 million tons/year
- Operates 4 landfill sites, with average 10 yrs landfill space

Projected Waste Disposal (Million Tons)



Policy drivers

Today

Proposed Strategy

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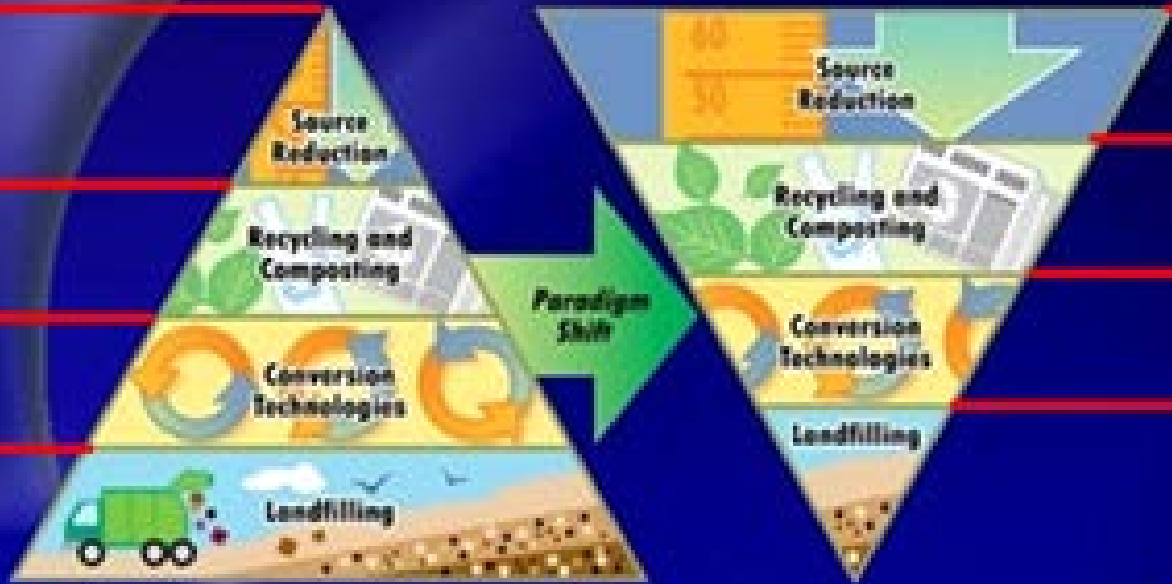
93%

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Current Practice

Paradigm shift to 2040

Landfill gas to electricity (LFG)

- The City initiated the landfill gas-to-energy CDM project in 2007 to mitigate the harmful greenhouse gases (GHG) emitted from the landfills and to generate renewable energy from waste.
- The renewable energy generated from the project will be fed into the municipal grid, thus off-setting largely coal derived electricity.
- The project will offset about 362,000 tons of CO₂/annum
- About 19MW will be generated from the project, can power approximately 12 500 middle income households
- The extraction and destruction of this gas has provided the City with an opportunity to receive revenue from CER's through the CDM process and from the generation and sale of electricity.
- DOE selected the project as an REIPPP in October 2013 to supply 18MW

Electricity from waste water treatment

Biogas to Energy plant at Northern WWTW's (13/14 FY)

- Electricity generated = 1.1MW
- Tons of CO₂ = 1874.95

Future developments

- 5 of the 6 WWTWs in Joburg will create biogas.
- Commissioning of the Driefontein biogas plant will happen in February 2015.
- Increase digester capacity at the Southern Works (Goudkoppies, Bushkoppie and Olifantsvlei WWTWs) in 15/16 FY that will enable JW to build biogas plants from 17/18
- The electricity generated from the gas is used to power the waste water treatment plant thus reducing the dependency on coal- driven electricity.

Waste to Energy

- The city is investigating the feasibility of a waste to energy plant to treat municipal solid waste
- This will be developed through a "design-build-finance-maintain-operate-transfer" public private partnership (PPP) model.
- Currently finalising the waste characterisation study and the financial modelling.

The City initiated all these projects to mitigate the harmful greenhouse gases (GHG) emitted from the landfills and waste water treatment plants and to generate renewable energy from waste.

Reducing waste to landfill

- Currently the City diverts 7% waste material for recycling
- Aim to achieve 20% reduction by 2016
- The City through PIKITUP is implementing separation at source at household to facilitate waste reduction to landfill.
- Currently the program has been rolled out to 480 000 households
- Have a waste pickers empowerment program to increase and formalise their participation and efficiency in recycling.
- About 7 Waste Pickers Cooperatives have been established and are participating in the City's separation at source program.
- PIKITUP investigating treatment technologies for green and construction and demolition waste.

Thank you for your attention