



# **EKURHULENI METRO MUNICIPALITY**

## **WASTE MANAGEMENT SERVICES DEPARTMENT**

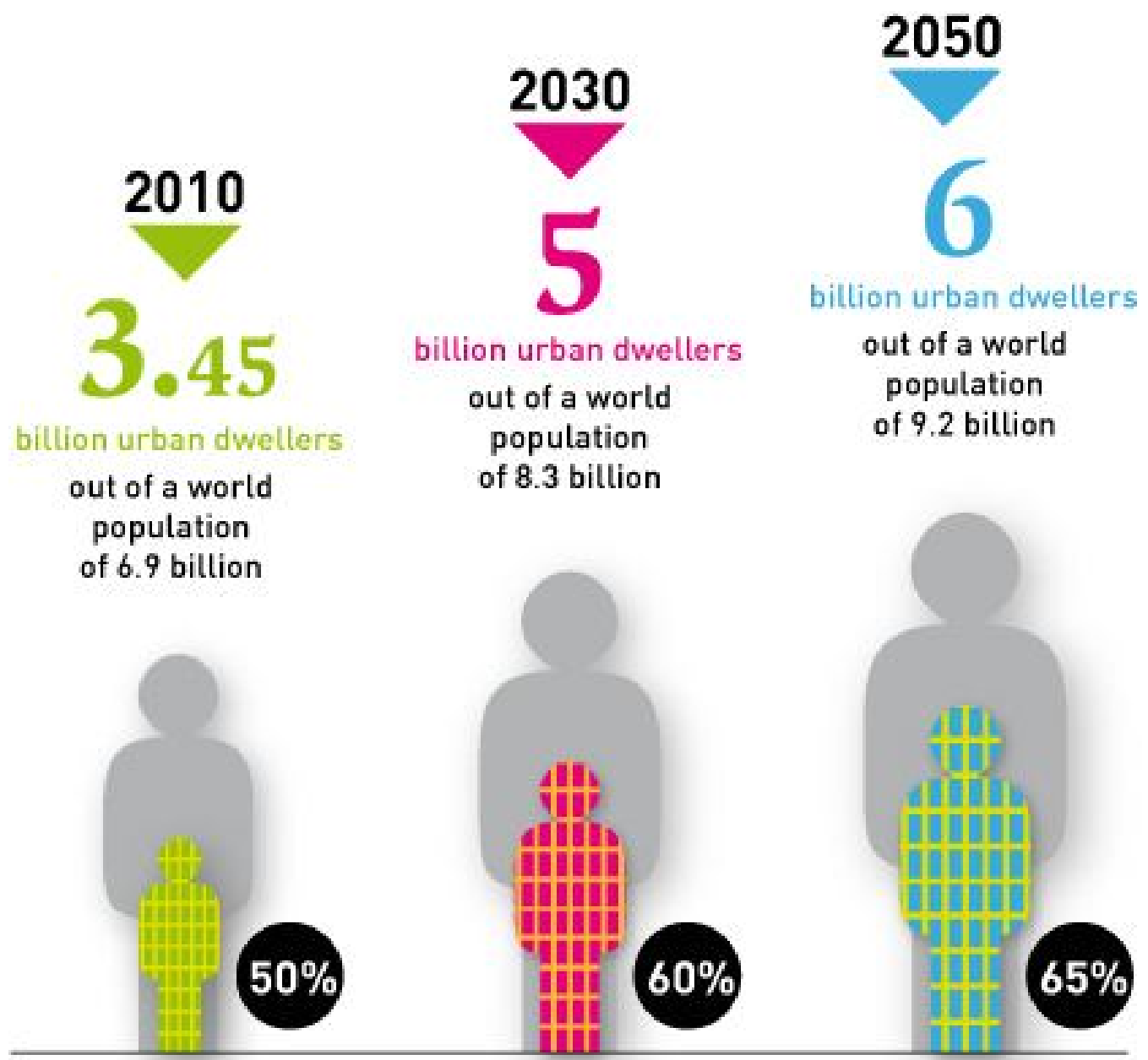
**Divisional Head Strategic Planning:**

**Eugene Hlongwane**



**The Blue Marble**







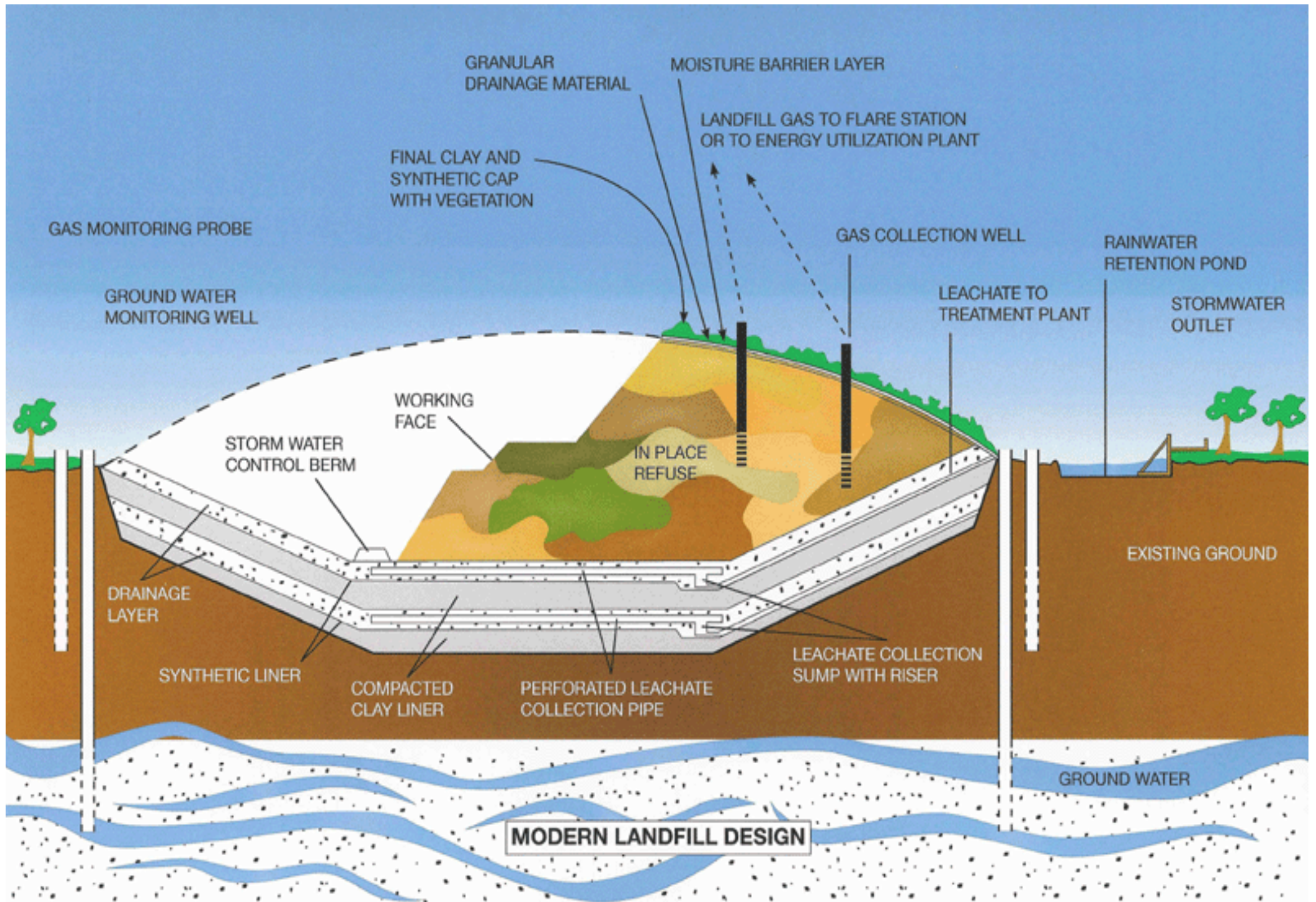


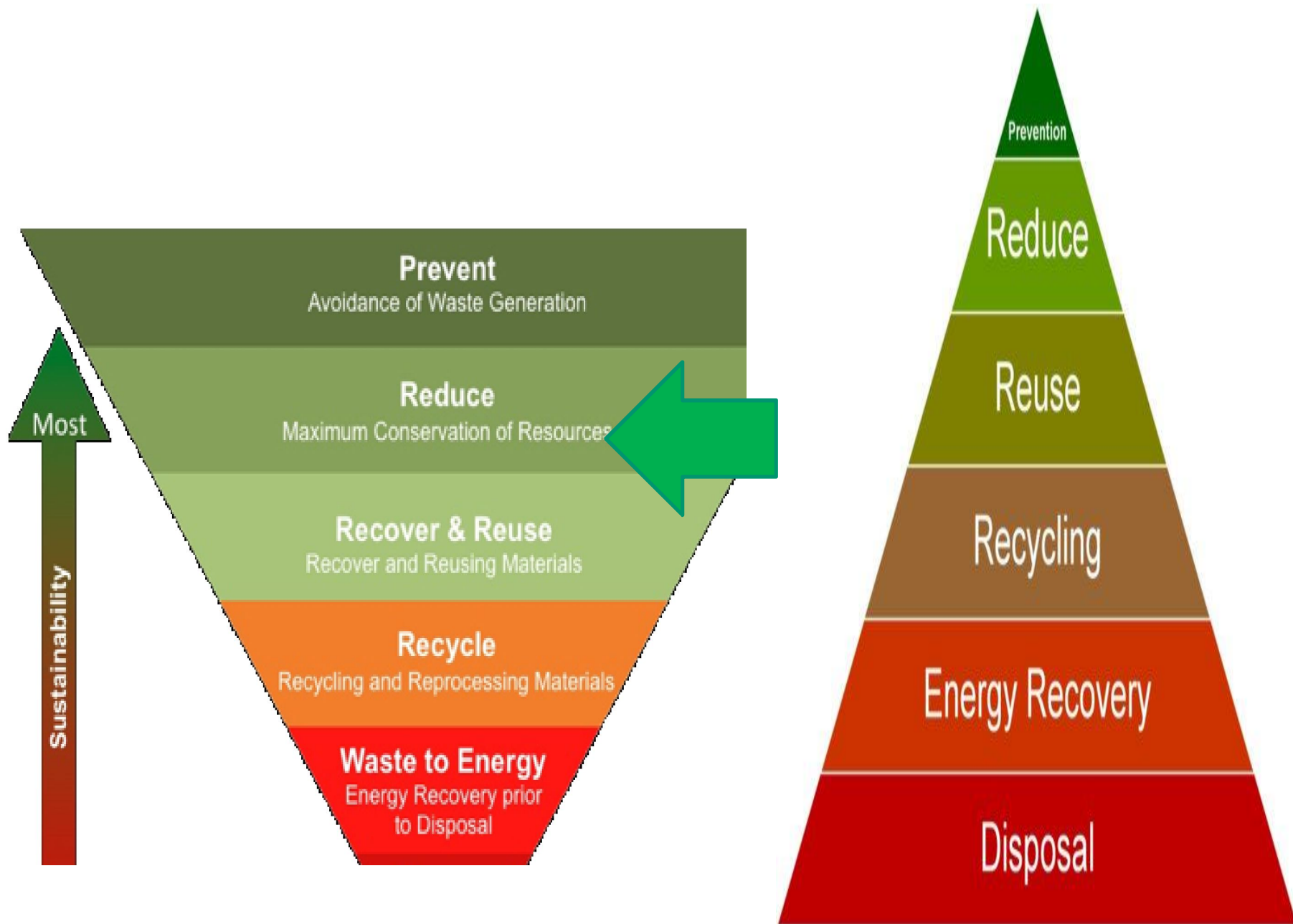
# WASTE MANAGEMENT

- Landfill is best practiced method of waste disposal in South Africa and around the world in developing countries
- A **LANDFILL** is a site for the disposal of waste materials by burial and is the oldest form of waste treatment
- Waste disposal at a landfill site is:
  - Confined to as small an area as possible
  - Compacted to reduce their volume
  - Covered (usually daily) with layers of soil
- Landfills are a significant source of methane – a GHG
- Leachate is produced - liquid that contains suspended solids and other chemical as water passes through the waste at a landfill site



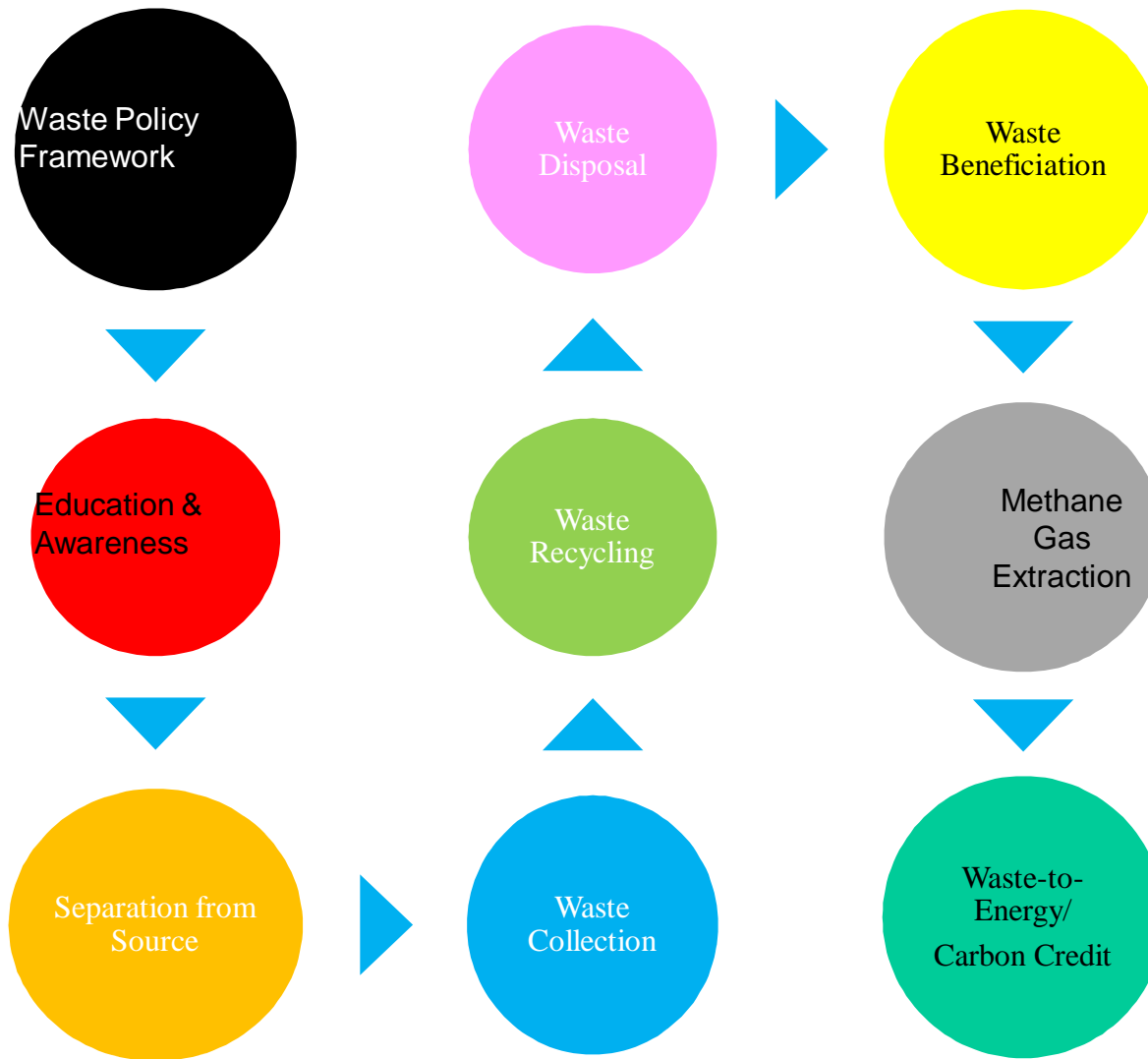








# INTEGRATED WASTE MANAGEMENT VALUE CHAIN



## ➤ Economic Drivers:

- Develop a Green Industry strategy & plan.
- Establish a Green Industry Development Council.
- Attract new Smart & Green industries.
- Develop enabling & catalytic infrastructures.
- Generate green Jobs
- Green Procurement.
- Carbon credit.
- Small Business Development.

# OPERATIONAL LANDFILL SITES

Nr	Name	Site Classification	Service Areas	Years Left	Current tons per day
1	Weltevreden	G:L:B-	Eastern Region Benoni, parts of Brakpan & Boksburg	25	1000
2	Rietfontein	G:L:B+ Co-disposal De-listed materials & Liquids	Eastern Region Nigel, Tsakane, Kwa-Thema & Springs	20	950
3	Rooikraal	G:L:B-	Southern Region Katlehong, parts of Germiston & Boksburg	21	1000
4	Simmer & Jack	G:L:B-	Southern Region Parts of Boksburg, Germiston & Bedfordview	7	1000
5	Platkop	G:L:B- disposal of asbestos powder/solids	Southern Region Alberton, Tekoza, Vosloorus & part of Katlehong	35	400



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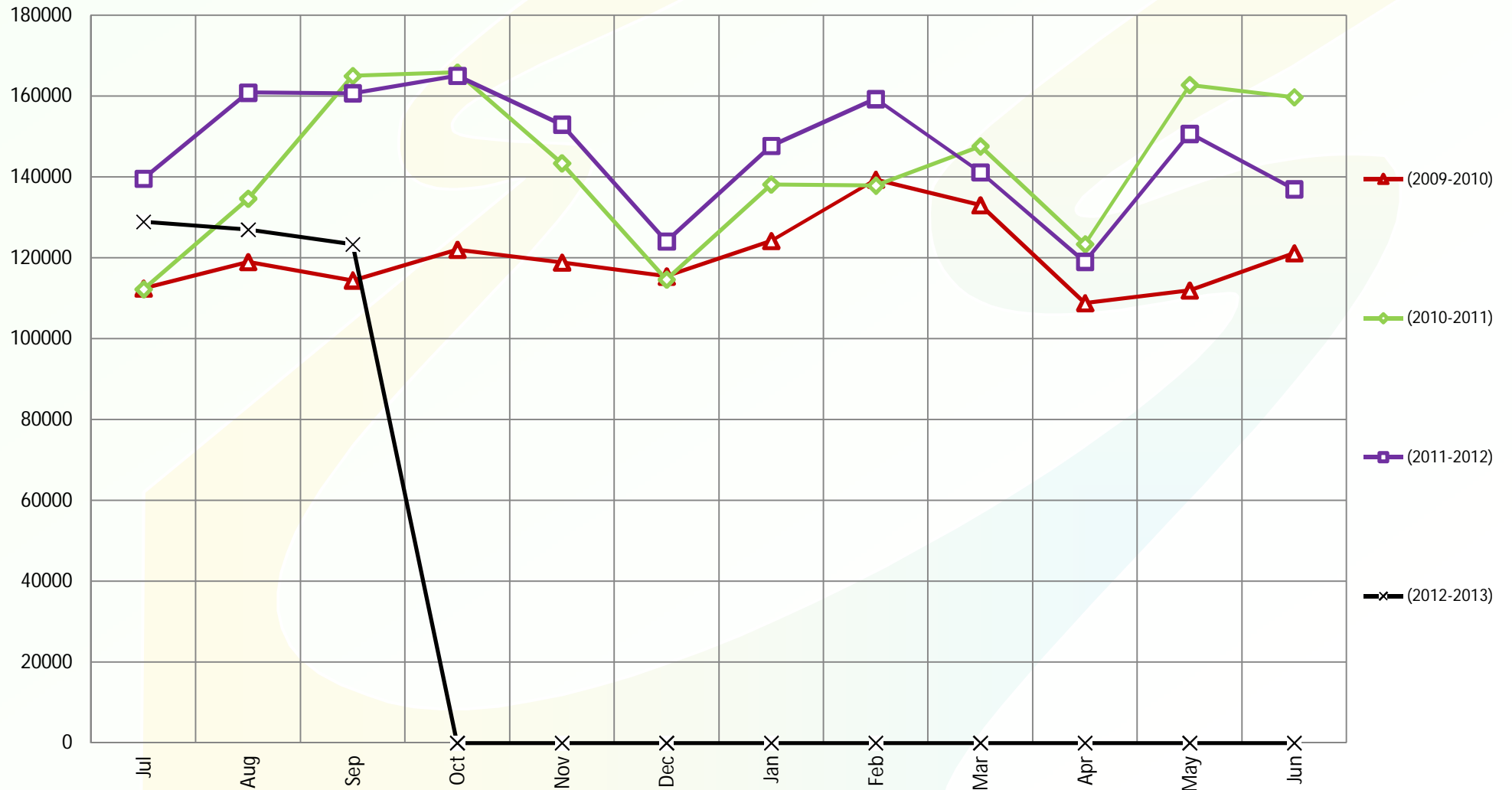
# Weltevreden ~ 2008





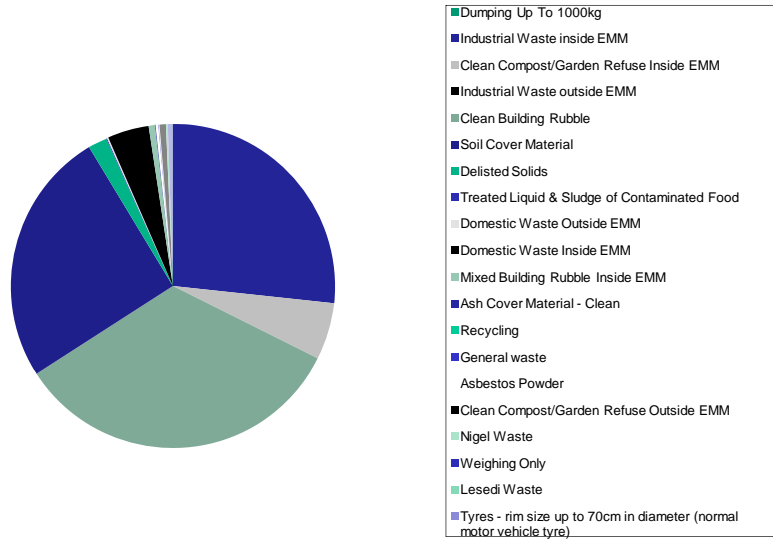
# WASTE STREAM VOLUMES

## Tonnages - All Sites

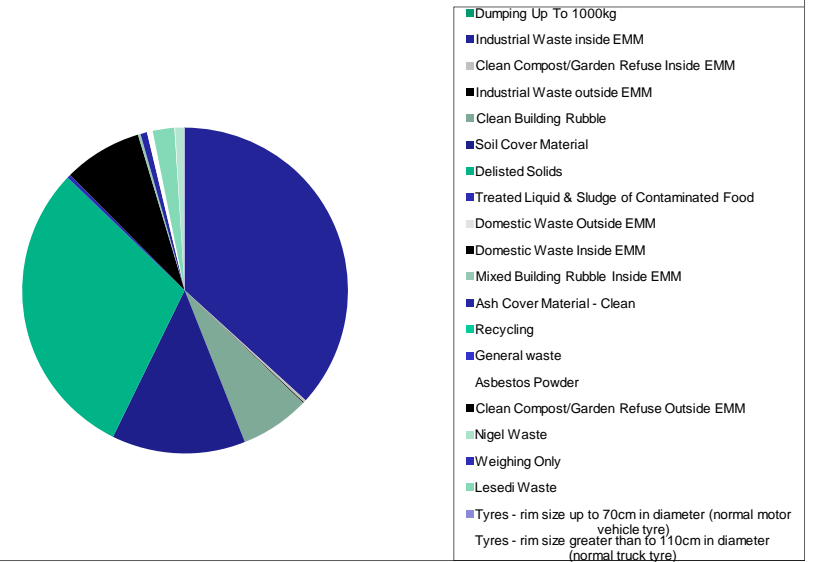


# EMM WASTE HIERARCHY

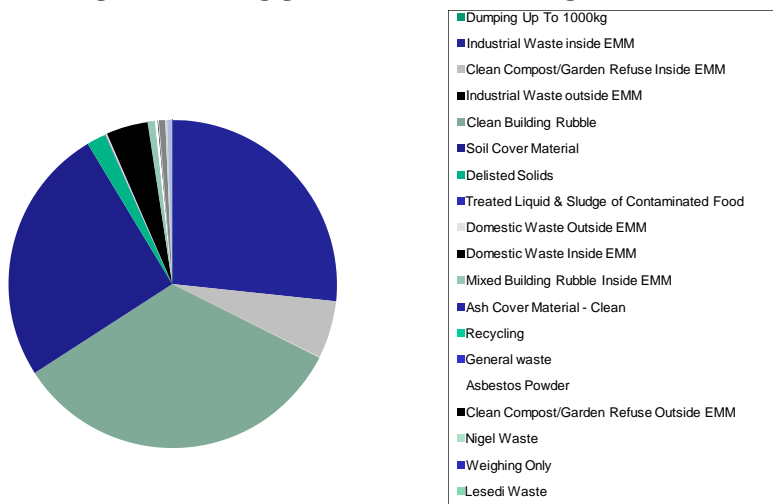
## WASTE TYPE SUMMARY ALL SITES



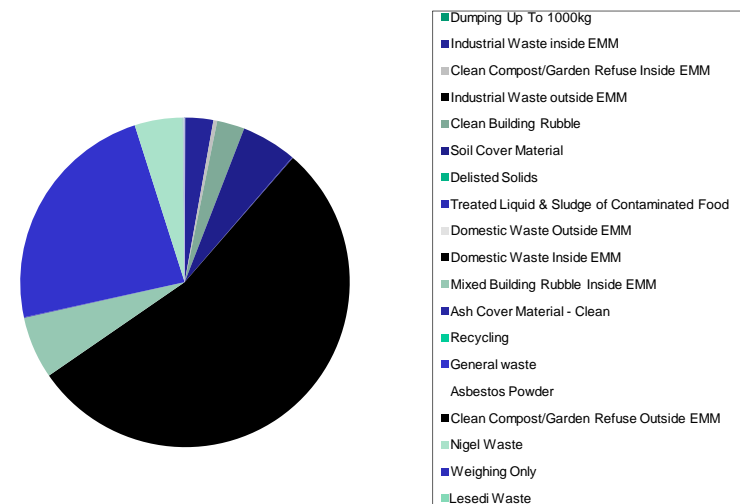
## WASTE TYPE SUMMARY ACC HOLDERS



## WASTE TYPE SUMMARY PRIVATES



## WASTE TYPE SUMMARY MUNICIPALITIES



# CLOSURE LANDFILL SITES

- 11 “closed” landfill sites of which 8 are formally rehabilitated:30 year monitoring and rehabilitation program after closure.

<b>Name of Site</b>	<b>Rehabilitated</b>	<b>Rod / Permit</b>
Nigel	Yes	Yes
Deep Levels (Kwa-Thema)	Yes	Yes
Wadeville	Yes	Yes
Sebenza	Yes	Yes
Chlookop	Yes	Yes
Tembisa	No	No
Southern Dumping Site	Yes	Yes
Alberton	Yes	Yes
Bullfrog Pan	Yes	No
Zuurfontein	No (Planning Phase)	No
Brakpan	No (Planning Phase)	No



# Rehabilitated landfill site - Sebenza





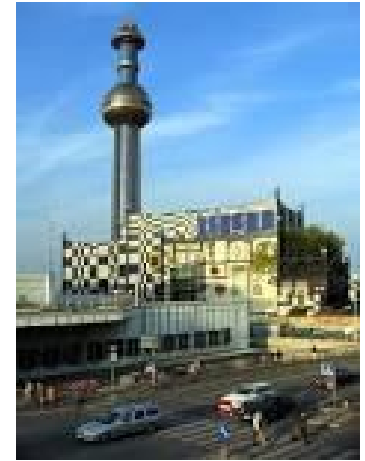
The Green Economy will address the financial crisis and the climate crisis

*“To address climate change we need an energy revolution, a wholesale change in how we power our societies. Economists agree as well: The hottest growth industry in the world is renewable energy”.*

*“Global investment in zero GHG energy will reach \$19 trillion by 2020”.*      Ban Ki Moon, Secretary General of the UN

SO . . .







# WHAT IS LANDFILL GAS?

Waste  
deposition

Decomposition

Landfill gas  
production:CH<sub>4</sub>



bacteria

- methanogenesis

moisture

- optimal moisture for bacteria to flourish

temperature

- optimal temperature for bacteria to flourish



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# GAS WELL FIELD INSTALLATIONS



7. Perforated well pipes



8. Wellhead



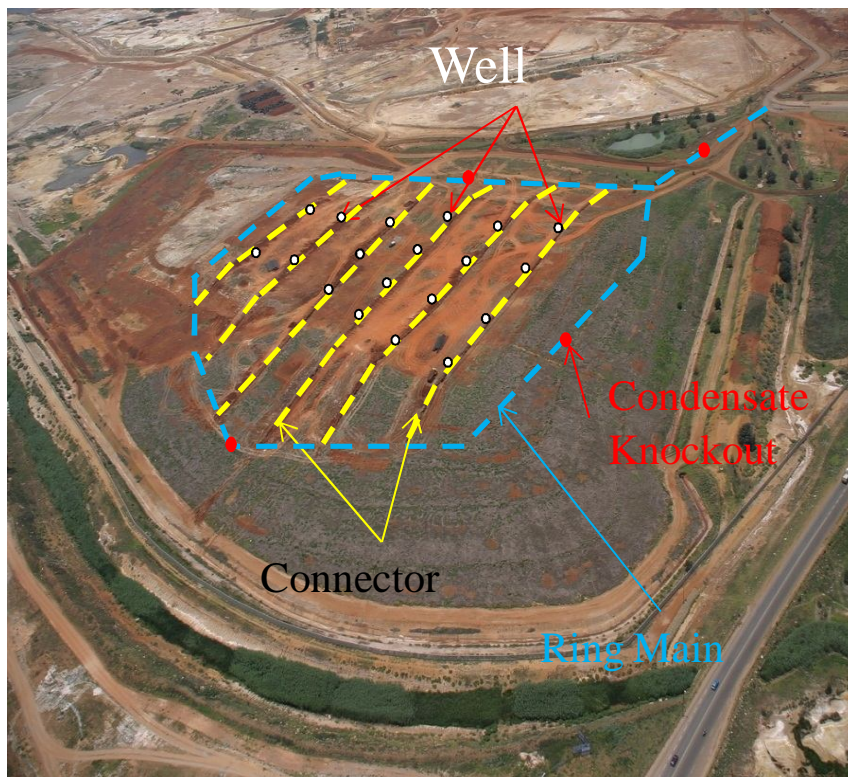
9. Installation of compound Knock-out pot



10. Casting of generator slab



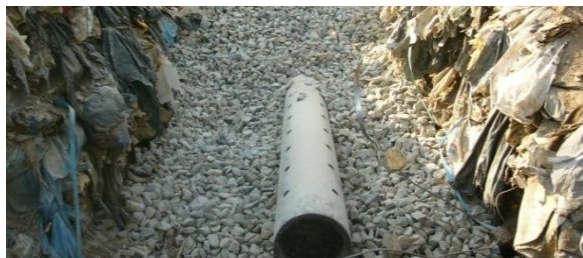
**Aerial view : vertical wells & conveyance lines**



**Condensate knockout installed**



**Installation of conveyance lines**



**Left: Aerial view- Large enclosed Flare**





*Simmer & Jack: 3000 Nm<sup>3</sup>/h*



*Weltevreden: 2000 Nm<sup>3</sup>/h*



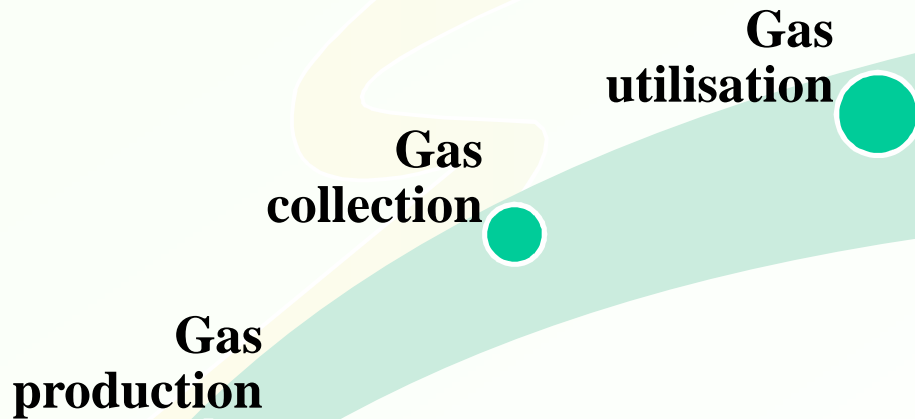
*Rooikraal: 2000 Nm<sup>3</sup>/h*



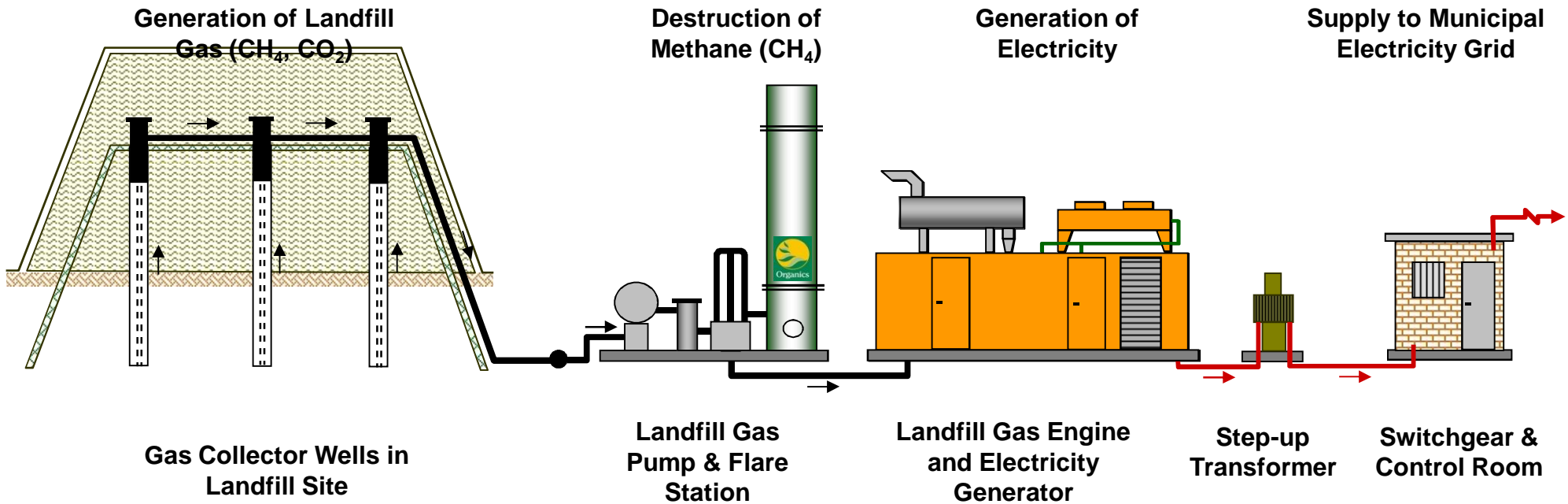
*Rietfontein: 1300 Nm<sup>3</sup>/h*



# LANDFILL GAS USE?



# LFG-to-Electricity



**Schematic Layout of Landfill Gas-to-Electricity Scheme**



# LFG-to-Electricity

- Potential – minimum 4 MW between the four landfills.
- Equivalent to the supply of power to approximately 2800 homes



# 348678 tonnes of CO<sub>2</sub> equivalent reduced

- Annual greenhouse gas emissions from **72,641** passenger vehicles
- CO<sub>2</sub> emissions from the electricity use of **47,974** homes for one year
- Carbon sequestered by **8,940,462** tree seedlings grown for 10 years

# Other LFG projects in SA

- South Africa currently has only five landfill gas to energy projects registered with the Clean Development Mechanism (CDM).

CDM approved LFG to energy projects	Owner of project	Carbon savings estimated per year (tonnes CO <sub>2</sub> e)
Ekurhuleni Landfill gas recovery project	Ekurhuleni Municipality	243 629
Alton Landfill gas to electricity project (private landfill site)	ENER-G	70 000
Enviroserv Chloorkop Landfill gas recovery project (private landfill site)	EnviroServ	188 000
Durban Landfill gas to electricity project- Marrianhill and La Mercy Landfills	Ethekwini Municipality	69 000
Durban Landfill gas to Electricity Project -Bisasar Road Landfill	Ethekwini Municipality	352 000



*eThekweni Municipality's landfill gas to electricity project at Bisasar Road*

<http://www.urbanearth.co.za/articles/slow-uptake-landfill-gas-energy-projects-sa>





# ENVIRONMENTALLY FRIENDLY APPROACH

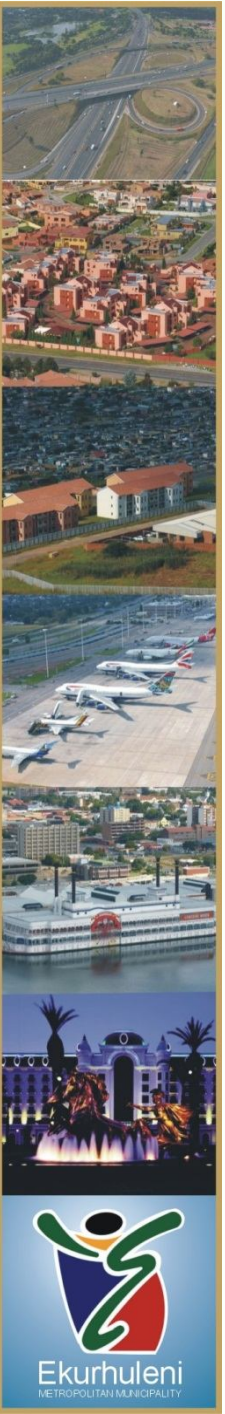
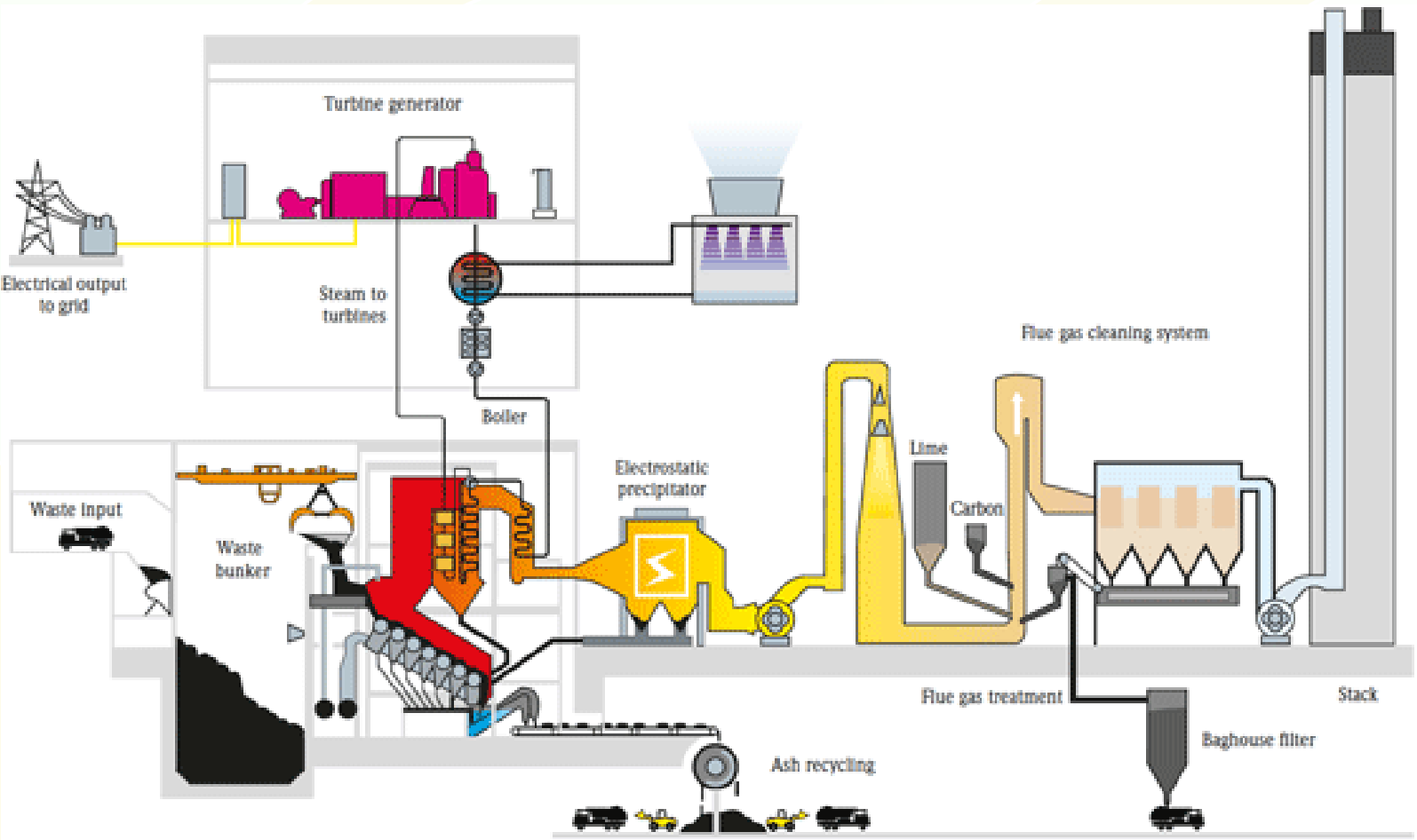
- Emission reductions
- Better air quality
- Reduce odours
- Reduce global warming effect
- Alternate/greener energy source
- Job creation in green economy sector



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# Waste to Energy

# WASTE TO ENERGY PROCESS

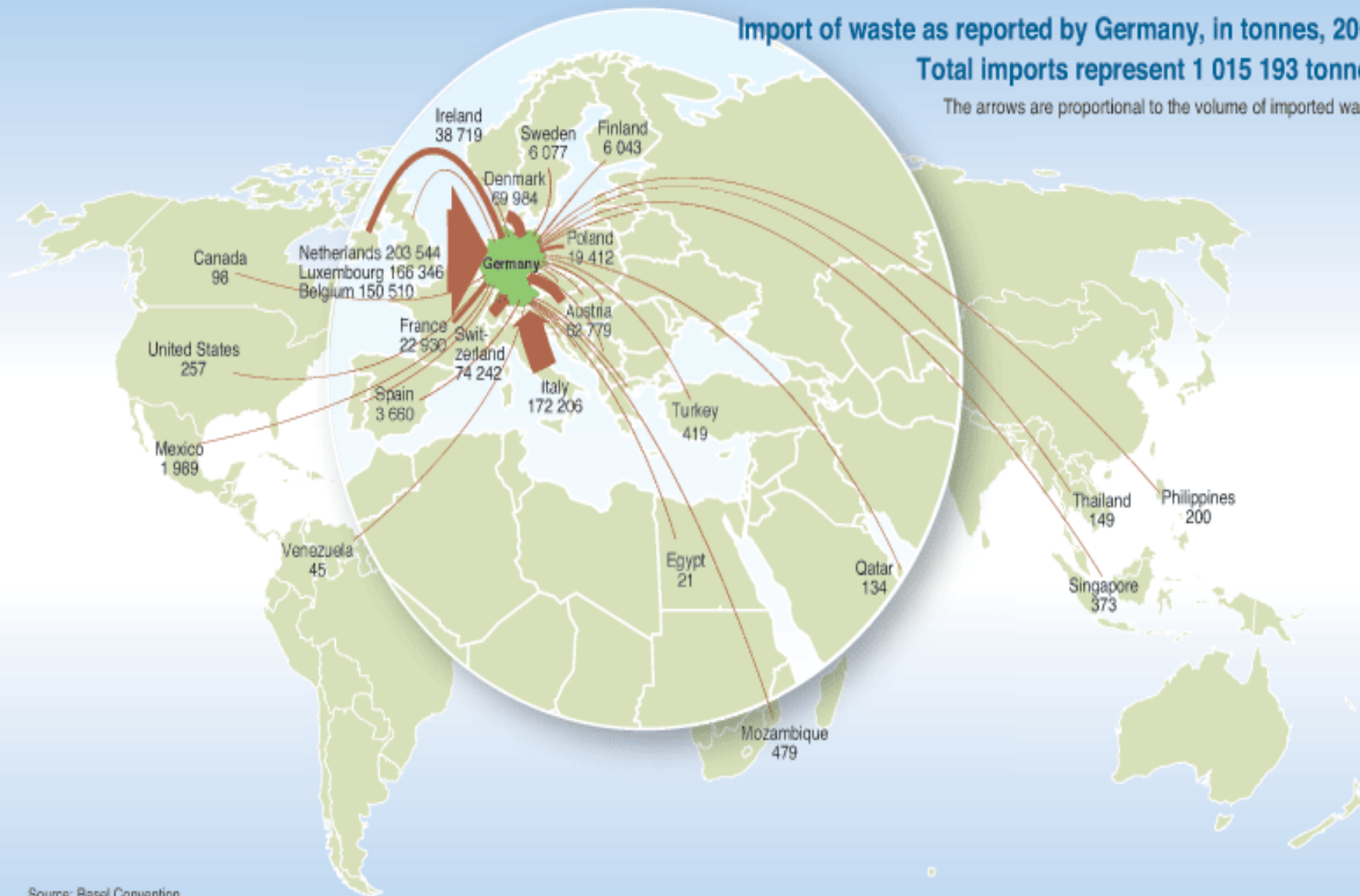




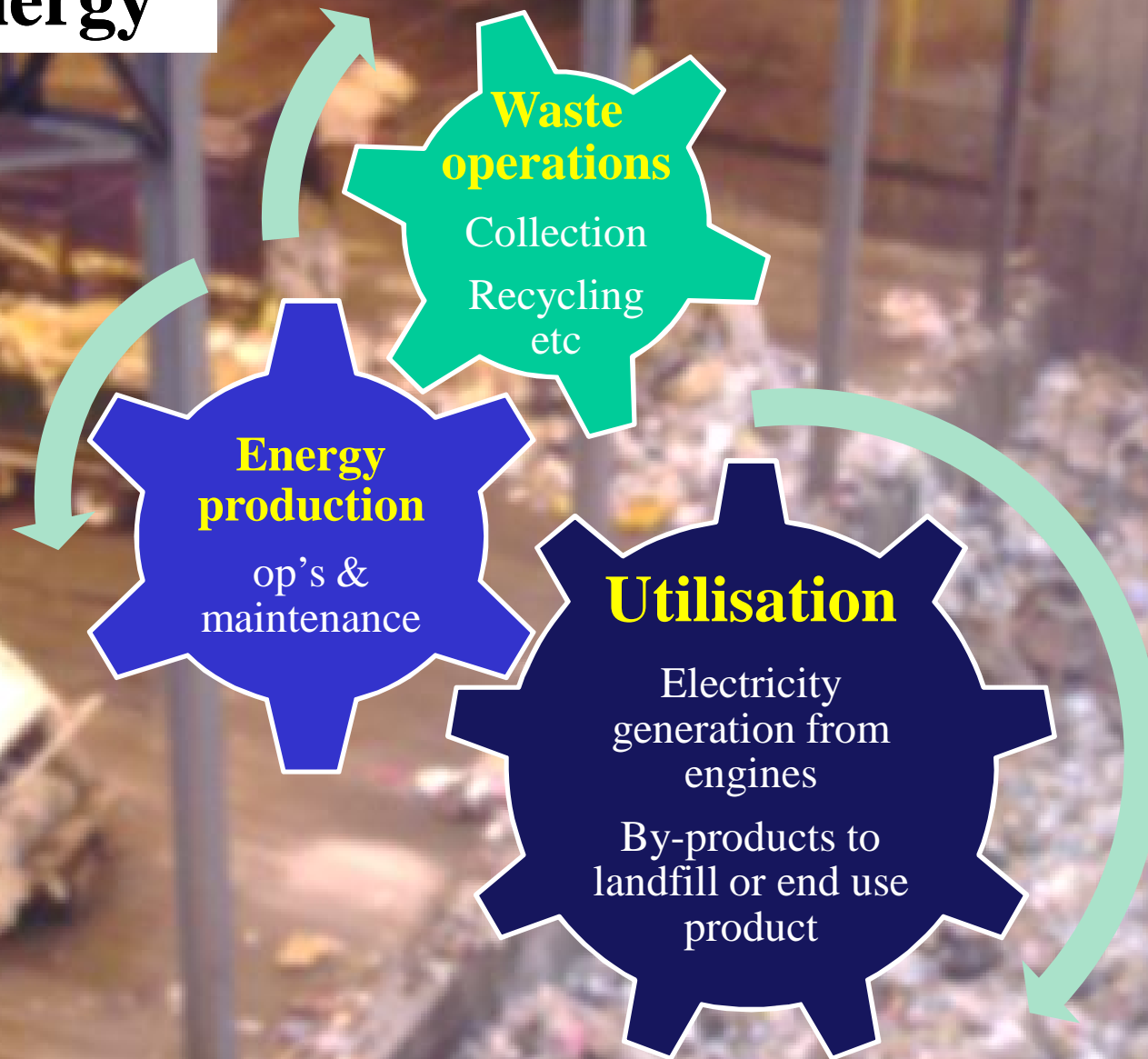
## Import of waste as reported by Germany, in tonnes, 2001

Total imports represent 1 015 193 tonnes

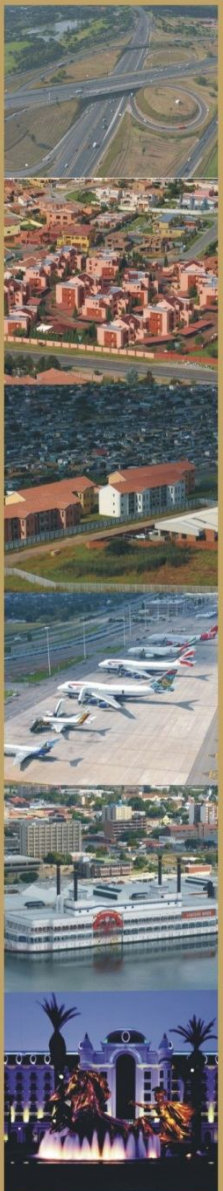
The arrows are proportional to the volume of imported waste



# Waste to Energy



*Thank you*



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