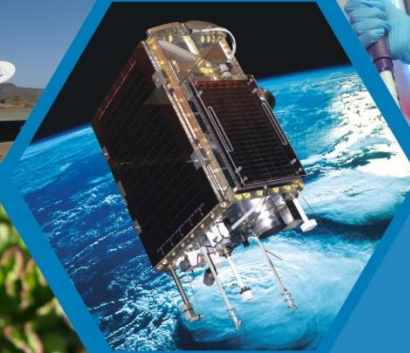


A Waste Research, Development and Innovation (RDI) Roadmap for South Africa

A Global Perspective on Waste Trends



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**science
& technology**

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

CSIR
our future through science

Global drivers

- Waste management is currently undergoing a major global paradigm shift
- Global drivers –
 - Climate change
 - Carbon economics
 - Resource scarcity



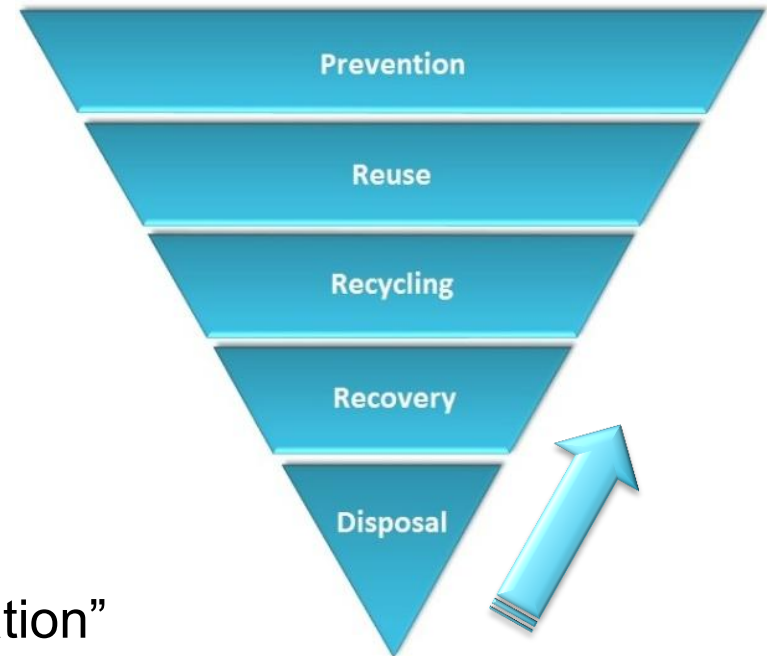
“Waste as renewable resource”

“Circular economy”

“Waste-to-Energy” or “Energy-from-Waste”

Local drivers

- South Africa is still largely at the periphery of this global transition
- Local drivers –
 - Legislation
 - Job creation
 - Energy security



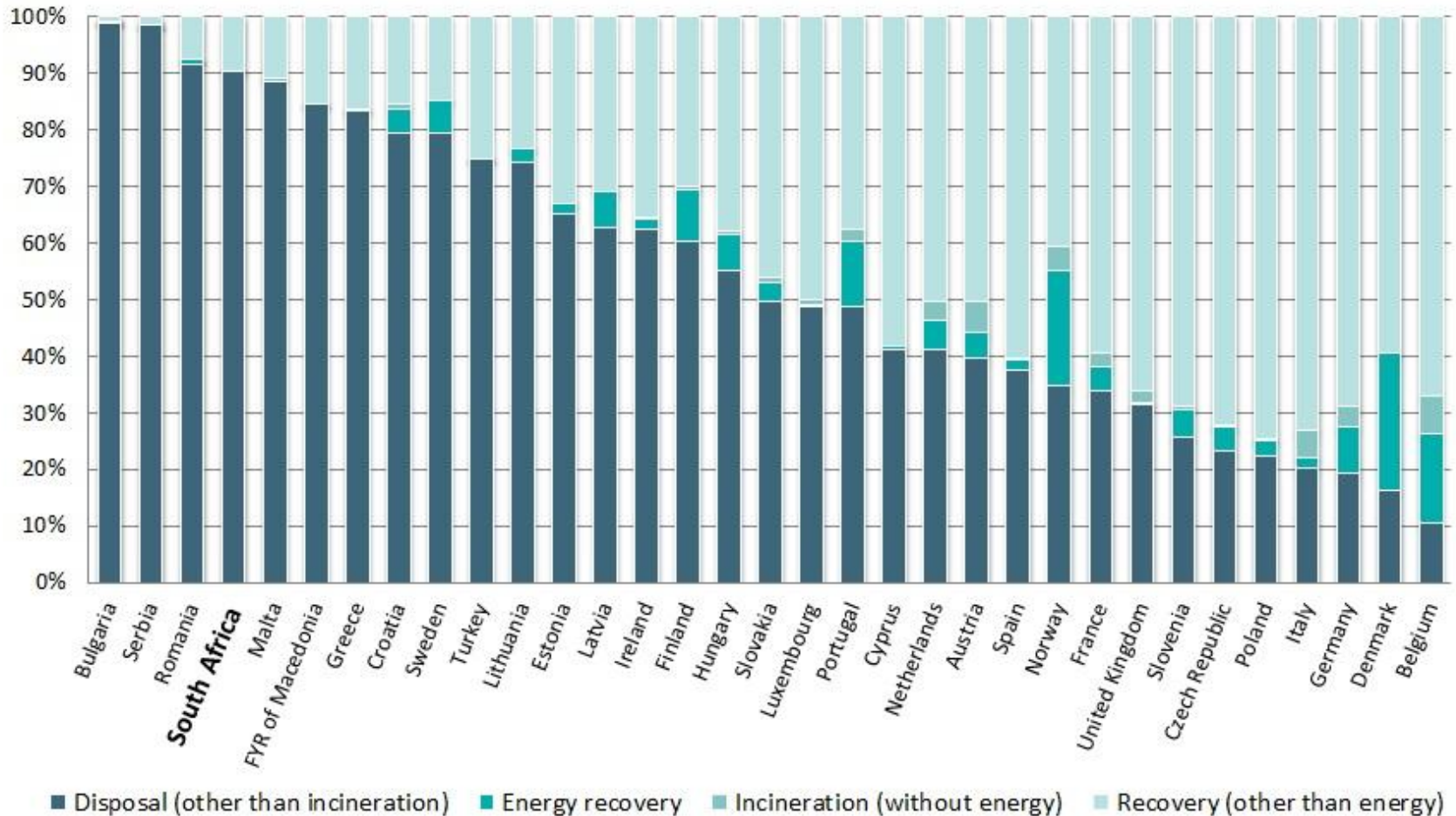
“Moving up the hierarchy”

“Enterprise development and job creation”

“Alternatives to landfilling”

Global Trends: Developed

Waste Management Technology Mix

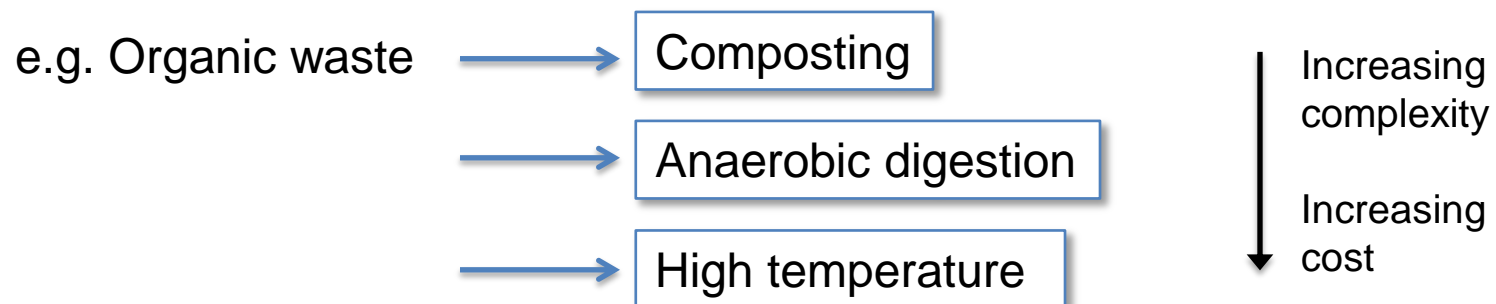


USA – MSW 46.4% recovery (incl. energy recovery) (EPA, 2013)

Adapted from EuroStat (2013)

Global Trends: Developing

- Actively pursuing alternative waste management option, focus on –
 - Increased materials and energy recovery
 - Through increased recycling and recovery
- However, technology responses vary between countries (from low to high technologies)



- Major focus areas for e.g. China
 - Waste recycling & recovery of metals
 - Recycling of large industrial waste streams, e.g.
 - fly ash
 - gypsum
 - mining waste
 - Energy recovery from waste, e.g. domestic waste, industrial waste, sewage sludge

Global Trends: New Projects

Top 10 Countries by New Waste Projects (number) (YTD 2013)

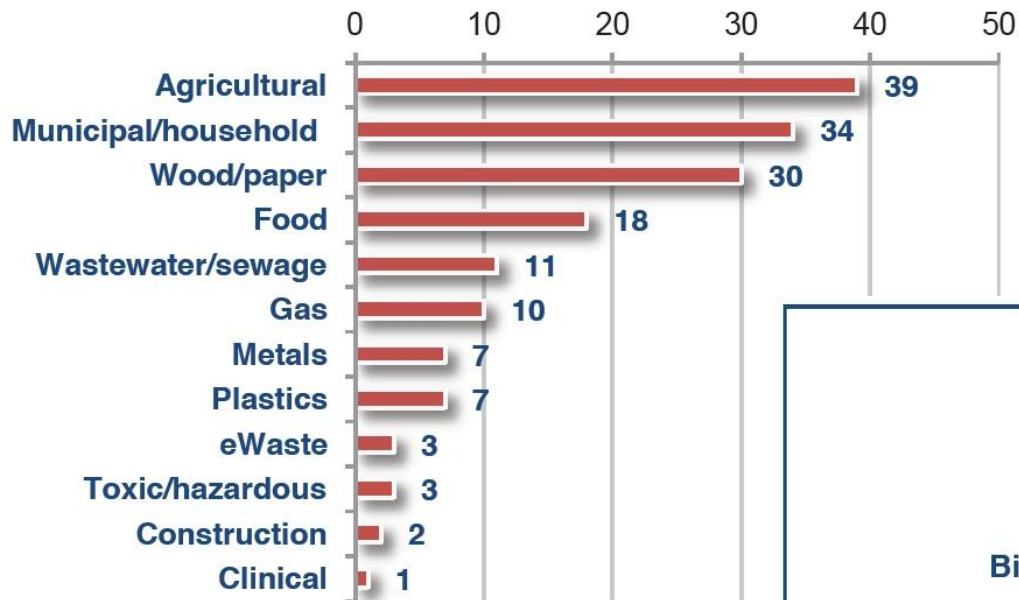
	Projects	% of Total
USA	295	20.4
UK	228	15.8
Canada	90	6.2
China	67	4.6
India	64	4.4
Japan	59	4.1
Germany	57	3.9
France	38	2.6
Finland	36	2.5
Australia	31	2.1
Others	482	33.3

Top 10 Countries by New Waste Projects (number) (Dec-13)

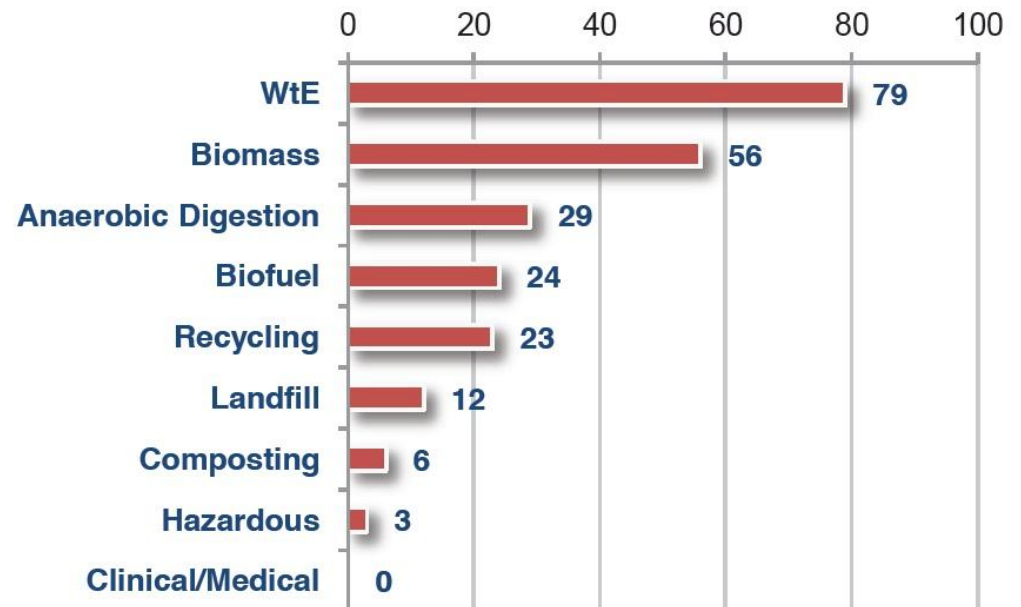
	Projects	% of Total
USA	33	22.1
UK	27	18.1
Canada	13	8.7
Germany	12	8.1
India	6	4.0
Pakistan	6	4.0
Chile	4	2.7
China	4	2.7
France	4	2.7
Russia	4	2.7
Others	36	24.2

Global Trends: New Projects

Projects by Waste Type, Dec-13



Projects by Facility Type, Dec-13



AcuComm Waste Futures
(December 2013)

Local Trends: Recycling rates

General Waste (2011)	Generated (t/yr)	Recycled (t/yr)	Recycled (%)
Metals	3 121 203	2 496 962	80
Paper	1 734 411	988 614	57
Organic waste (component of municipal waste)	3 023 600	1 058 260	35
Glass	959 816	307 141	32
Plastic	1 308 637	235 555	18
Construction and demolition waste	4 725 542	756 087	16
Tyres	246 631	9 865	4
Other (biomass)	36 171 127	0	0
Municipal waste (non-recyclable portion)	8 062 934	0	0
TOTAL	59 353 901	5 852 484	~10

Hazardous Waste (2011)	Generated (t/yr)	Recycled (t/yr)	Recycled (%)
Batteries	32 912	32 254	98
Waste oils	120 000	52 800	44
Miscellaneous	327 250	0	0
Inorganic waste	290 154	0	0
Tarry and Bituminous waste	255 832	0	0
Other organic waste without halogen or sulphur	202 708	0	0
Health Care Risk Waste	46 291	0	0
Asbestos containing waste	33 269	0	0
Organic halogenated and/or sulphur containing waste	8 389	0	0
Mercury containing waste	868	0	0
Organic solvents without halogens and sulphur	771	0	0
POP waste	486	0	0
Organic halogenated and/or sulphur containing solvents	111	0	0
TOTAL	1 319 096	85 054	~6

DEA Waste Baseline Report
(2012)

Local Trends: Recycling rates

General Waste (2011)	Generated (t/yr)	Recycled (t/yr)	Recycled (%)
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Municipal waste (non-recyclable portion)	8 062 934	0	0
TOTAL	59 353 901	5 852 484	~10

Unclassified Waste (2011)	Generated (t/yr)	Recycled (t/yr)	Recycled (%)
Slag	5 370 968	2 685 484	50
Sewage sludge	673 360	130 160	19
Waste of electric and electronic equipment (WEEE)	64 045	6 884	11
Fly ash and dust from miscellaneous filter sources	31 420 488	1 885 229	6
Bottom ash	5 717 324	0	0
Brine	4 166 129	0	0
Mineral waste	369 000	0	0
TOTAL	47 781 314	4 707 757	~10

DEA Waste Baseline Report
(2012)



Conclusion

- Globally, focus on –
 - Increased recycling and recovery (incl. energy recovery)
 - Different countries have followed different paths
 - Organic waste; recyclables (metals, plastic, paper, glass); large waste streams (power generation & mining waste)
- South Africa –
 - Still predominantly landfilling
 - Fair recycling rates for metals; packaging waste; batteries; waste oil; slag
 - Not too much movement on our big volume waste streams (mining, power, organic); hazardous waste

