environment & tourism

Department:
Environment Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

A NATIONAL POLICY DEVELOPMENT PROCESS ON WASTE INCINERATION AND THE CO-PROCESSING OF SELECTED WASTES AS AFR IN CEMENT KILNS

Key findings: Incineration

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Key findings - incineration

- Landfilling of waste is still the most generally used waste management method
- Because of the GHG emission emitted from landfill - landfilling is not regarded as BAT in many countries and measures have been put in place to redirect waste from landfill – landfill directive
- Where landfilling of waste is restricted, among other waste management measures incineration is practiced
- Lanfilling in SA contributes >2% of GHG emissions (1994)
- MR – considers the env significant concentrations = few parts per million – concentrations in redundant chemicals &formulated products can be > 1 million mg/lt
- High concentration wastes encapsulated in concrete. Encapsulation = waste being stored for further generations to find a solution
- Wastes can be reactive or extremely volatile - encapsulations not an acceptable option

Key findings - incineration

- Can incinerate hazardous waste and municipal waste but need to differentiate between them:
  - Objective of incinerating hw is the destruction of the hazardous substance and preventing human and environmental exposure to the substance release
  - Objective of incinerating mw is the reduction of the waste volume, destruction of infectious materials and the utilisation of the energy content of the waste – 90% reduction
- For some waste types for example solvents not being recycled and POPs waste incineration is regarded as being an acceptable waste management option
- Guidelines for the environmentally sound incineration of hazardous waste have been prepared by a number of international organisations including the Basel Convention Secretariat, UNEP Chemicals and the EU

Key findings - incineration

- Incineration must be undertaken in a strict operating regime w.r.t temperature, retention time among others
- One of the main concern with incineration is the generation and release of unintentionally produced POPs (dioxins and furans
- By applying BAT technologies flue gas can be cleaned to a level considered acceptable within international agreements on reduction of atmospheric pollution for example the Stockholm Convention
- BAT implies the use of techniques for specifically reducing the content of dioxins and furans and mercury - the addition of activated carbon to the flue gas is the most common mitigation method

Key findings - incineration

- Dioxin emissions have reduced from 400ng TEQ in 1990 to 0.5 in 2000 and is now 0.1 ng TEQ/Nm3 or lower
- The costs of incineration exceed landfill rates
- SA is intending to use EU standards should this be a technology for consideration in SA
- Gauteng applies international emission standards for waste incineration, should this be a technology for further consideration in South Africa, DEAT is proposing to similarly use international standards
- in SA incineration is the probably the only process in which the dioxin and furan emissions are currently controlled through legislation
- Costs associated with incineration are higher than that of landfill in the country – not expected that there will be significant increases in incineration in the future without a major strategy and interest by municipalities

Key findings - incineration

- Globally there has been a reduction of 60% in annual mean dioxin and furans levels found in breast milk over a 12 year period between 1985 – 1988
- Factors which influence the formation of dioxins and furans have been thoroughly studied in the past 20 – 30 years
- Dioxins are a persistent organic pollutant which cumulates in fatty tissue, they are carcinogenic and can lead to endocrine disturbance
- The effects of dioxins and furans are now known and have been considered when drawing up emission standards for sound operation of incinerators and cement kilns co-processing hazardous wastes

Key findings - incineration

- Can generate electricity from incineration – internationally 46 billion KWh produced annually
- In SA 18 million tons of general waste is generated per annum can produce 2450MW electricity which is equivalent to one coal fired power station
- With the high-risk organic hazardous waste stream being acceptably managed, DEAT able to identify & prioritize waste streams for diversion to recycling or other forms of reuse or treatment
- Opens a path for collaboration of municipalities to form public private partnerships and make best use of the economics of scale in waste management

Key findings - incineration

Source category	Activity t/year	Annual emission to air		Annual release to residues
		g I-TEQ/year		g I-TEQ/year
		Medium	Range	Medium
Uncontrolled domestic waste burning	10,000-31,000	6.2	0.5-16	12
Open burning of wood from construction and demolition	860-6,200	0.21	0.02-1.2	0.04
Landfill fires	*	5.5	0.68-10	ND
Total	10,900-37,200	12	1.2-27	12 ?

Processes	**Emissions per year in g TU (toxicity units) *1**		
	1990	**1994**	**2000**
Metal extraction and processing	740	220	40
Waste Incineration	400	32	0,5
Power Stations	5	3	3
Industrial Incineration Plants	20	15	<10
Domestic Firing Installations	20	15	<10
Traffic	10	4	<1
Crematoria	4	2	<2
Total emissions, air	1,200	330	<<70

Key findings - incineration

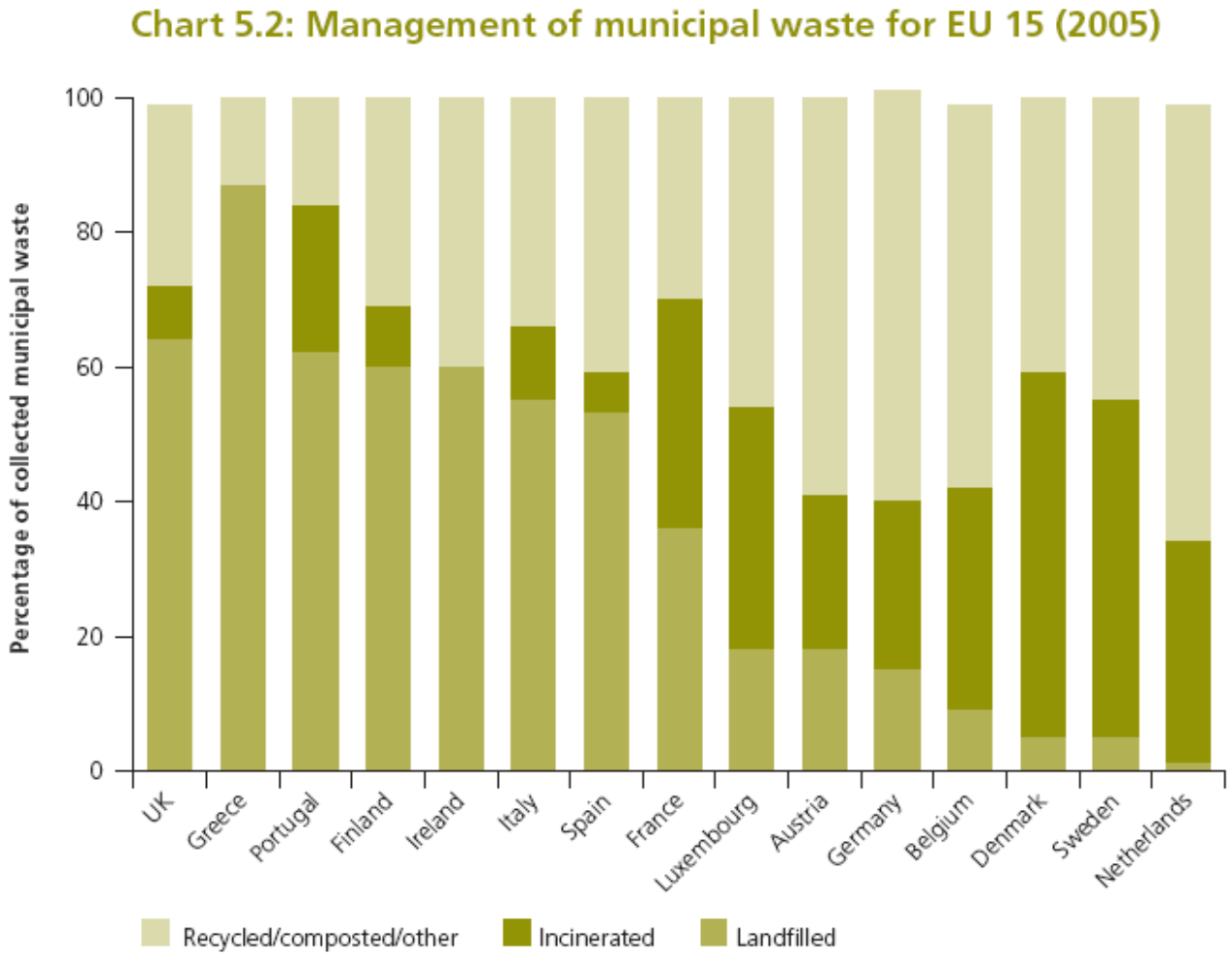
Country	No of incinerators	Metric tons of waste per annum	Metric tons incinerated
Netherlands	13	39.7	3.2
Italy	50	30	2.8
Germany	66	52	11.1
France	130	35.5	11.3
Denmark	32	3.6	2.0
Austria	8	4.9	1.4

Additional countries using incineration technology		
Finland	Canada	Taiwan
Sweden	Hong Kong	Singapore
United Kingdom	Japan	China
Belgium	Poland	Switzerland
Spain	Latvia	Norway
USA	Lithuania	South Corea
Nigeria	South Africa	Angola

Key findings - incineration

- Recent research indicates that the amount of municipal waste generated per year is expected to grow by 25% within the EU from 2005 to 2020
- Recycling and materials recovery in the EU is also expected to increase from 36% current level to around 42% by 2020
- Incineration is expected to increase from 17% current level to 25% in 2020 in the EU, these figures demonstrate that even in countries where large amounts of the waste stream are recycled and these rates will increase, incineration still fulfils a waste management function
- While recycling and incineration will increase landfilling of waste will decrease from the current 47% to 35% in 2020
- The move away from landfill has been a specific goal in the EU, dedicated legislation namely the "waste directive" has been passed to completely move away from landfilling of organic waste, for both environmental as well as climate change considerations

Key findings - incineration



Source: Eurostat

Key findings - incineration

- Have considered all comments received to date, still receiving waste
- To date issues raised can be mitigated for managed
- There appear to be advantages in considering incineration technology in the country
- DEAT confirms that it is proposing to recommend to the Minister that the regulated use of incineration is an option for consideration for the treatment of waste in South Africa
- Not final decision - will still be considering inputs

Thank you