



environment  
& tourism

Department:  
Environment Affairs and Tourism  
REPUBLIC OF SOUTH AFRICA

# NATIONAL POLICY ON THERMAL TREATMENT OF GENERAL AND HAZARDOUS WASTE

UEMP Conference  
21 May 2009

# **Background**

**Prior to this project there was no policy on the destruction of waste through incineration or the substitution of high calorific hazardous waste in cement kilns as an coal substitution. This lack of policy direction impacts on governments decision making on these matters and is hindering development of these technologies in the country**

**The cement industry in South Africa have identified certain cost saving in substituting a percentage of their traditional coal base fuel with high calorific waste and have been perusing a strategy to use AFR's in their cement making process and have submitted several EIA to provincial government for consideration**

# Background

The tyre industry has similarly identified the benefits of managing the tyre waste problem in through the use of waste tyres in cement kilns as an energy source, and has embarked on a process to develop a waste tyre management plan using this technology

NGO's in South Africa are fundamentally apposed to incineration in all forms including the use of AFR's in cement production and have opposed each application.

NGO's, Provincial Government, the cement, tyre and waste industries have put pressure on DEAT to develops a policy to assist in decision making on thermal technologies

# **Background**

**DEAT has embarked on a policy development process to determine the acceptability or not of the above technologies for use in South Africa**

**In December 2006 DEAT received MinMec's mandated to develop the policies**

**International & local consultants were contracted in May 2006  
Public participation process began in May**

**Minister has approved the policy for final promulgation awaiting the proclamation**

**How does the project link with the bigger context of your institution - the policy**

**In order to manage CO<sub>2</sub> emission internationally countries have looked at energy substitution and the reduction of CO<sub>2</sub> and methane emissions**



**In many countries waste is incinerated and the heat recovered for electricity production - 46 billion kWh/annum**

**Waste is also used in cement kilns as alternative fuels & raw materials, 40% of the energy usage of cement kilns technology can be replaced by waste and 10% of feed materials**

**Landfills disposing of organic waste produce methane which is a GHG 20 x more potent than CO<sub>2</sub> - it is estimated that landfills contribute > 2%/annum of GHG emissions in SA**



**In SA there are significant opportunities to utilize waste. Most domestic & hazardous waste is landfilled. SA produces approx 18.5 million tons of waste/a - could generate 2450 MW of electricity = capacity of one power station.**



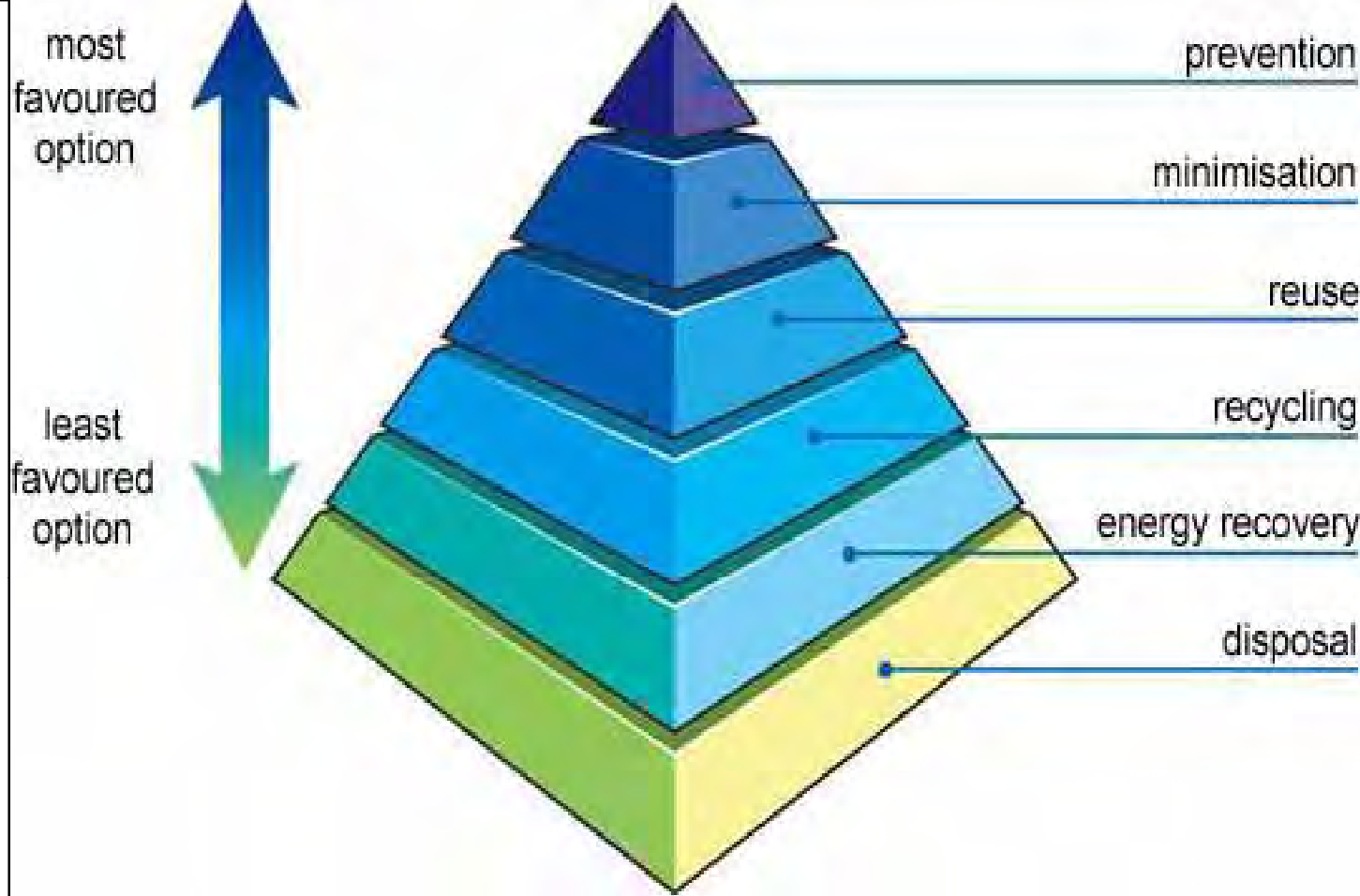
**There is currently no real waste management solution for tyres – pollution from tyre burning for steel recycling is common place**



**The cement industry can provide a solution for waste tyres that cannot be recycled – while providing a waste management method the energy from tyres can be used in the kiln as fuel**



**Blending platforms provide a homogeneous fuel to the cement kilns for use, they represent a new industry in the country, provide jobs and retain engineering skills in the country**



**The National Waste Management Act is based on the principle of the waste hierarchy, co-processing and incineration technologies provide an opportunity to realize the objectives of the waste hierarchy in the country**

# **How does the project link with the bigger context of your institution - the policy**

**Provides leadership on the use of incineration and co-processing technology as requested by NGO's, provinces and industry**

**Provides an opportunity to manage waste higher up on the waste hierarchy - meets the objectives of the Waste Act**

**Explores the potential benefits in terms of electricity generation, climate change, job creation and sustainable resource use**

**Provide a honest description of the project  
and highlight how challenges were overcome  
in the implementation**

# Challenges

- **Difficult consultation process – NGO opposed to incineration**
- **Large number of comments received**
- **Industry raising concerns at the 11<sup>th</sup> hour**
- **Meeting timeframes of Working Group II, MinTech and MinMec difficult**
- **Issues raised in the Parliamentary process on the waste bill**
- **Extension to the consultation process to include communities living around cement kilns**
- **Timing in relation to changing cabinet**



**Successful project which exposed staff and local consultants to a wealth of new information, and the best international expertise. Well research policy, extensively consulted. Policy provides the opportunity to increase the technologies in the country for the management of hazardous waste specifically organic waste**

**How will the outcomes of this project  
contribute to improving institutional/legislative  
and/or policy changes**

# Minimum requirements set

- Developed and negotiated emission limits for incineration & co-processing technologies
- Developed an EIA review guideline for the use of AFR in cement kilns
- 3 meetings with provinces to review EIAs associated with co-processing
- Developed a Guideline for co-processing of alternative fuels and raw materials and treatment of organic hazardous wastes in cement kilns
- Cement production technology in SA assessed & their ability to co-process AFR's & treat hazardous wastes assessed



environment & tourism

Department:  
Environment Affairs and Tourism  
REPUBLIC OF SOUTH AFRICA

NATIONAL POLICY ON HIGH TEMPERATURE  
THERMAL WASTE TREATMENT AND CEMENT  
KILN ALTERNATIVE FUEL USE

Guidelines for treatment of hazardous wastes and  
co-processing of AFRs in cement kilns

Project No.	2011/0001
Document No.	1/1/11
Date	2011/01/01
Author	Dr. Alan Holm-Kennedey



environment  
& tourism

Department:  
Environment Affairs and Tourism  
REPUBLIC OF SOUTH AFRICA

# Air Emission Standards for the Incineration of General and Hazardous Waste in Dedicated Incinerators

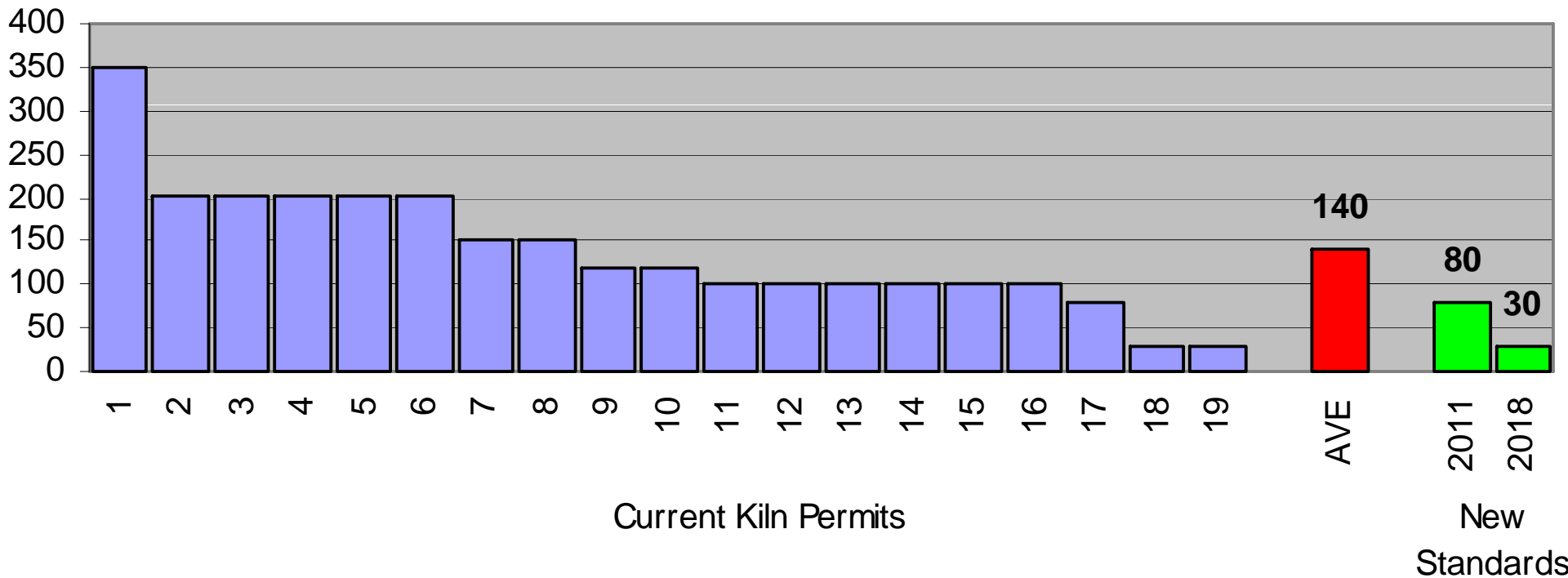
EMISSIONS	AIR EMISSION STANDARD <sup>1</sup>
PM (Total Particulate Matter)	10
TOC	10
CO	50
HCl	10
HF	1
SO <sub>2</sub>	50
NO <sub>x</sub>	200
NH <sub>3</sub>	10
Hg	0.05
Cd + Tl	0.05
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V (Sum total)	0.5
PCDD/PCDF (ng/Nm <sup>3</sup> I-TEQ)	0.1

# Air Emission Standards for the Co-processing of Selected General and Hazardous Waste as AFR in Cement Production

EMISSIONS	AIR EMISSION STANDARD <sup>1</sup>
PM (Total Particulate Matter)	30 <sup>2</sup> (80) <sup>3</sup>
TOC	10 <sup>4</sup>
HCl	10
HF	1
SO <sub>2</sub>	50 <sup>4</sup>
NO <sub>x</sub>	800 <sup>5</sup>
Hg	0.05
Cd + Tl	0.05
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V (Sum total)	0.5
PCDD/PCDF (ng/Nm <sup>3</sup> I-TEQ)	0.1

# Dust Emissions & SA Cement Kilns

Dust Limits (mg/m<sup>3</sup>)



**How will the outcomes of this project  
contribute to improving institutional/legislative  
and/or policy changes**

**Developed a Guideline for co-processing of alternative  
fuels and raw materials and treatment of organic  
hazardous wastes in cement kilns**

**Cement production technology in South Africa and an  
evaluation of their ability to co-process AFR's and treat  
hazardous wastes**

How does the project link to programmes on national, provincial or local level



Blending platform will be established to provide homogenous fuels to the cement kilns – guideline will be developed

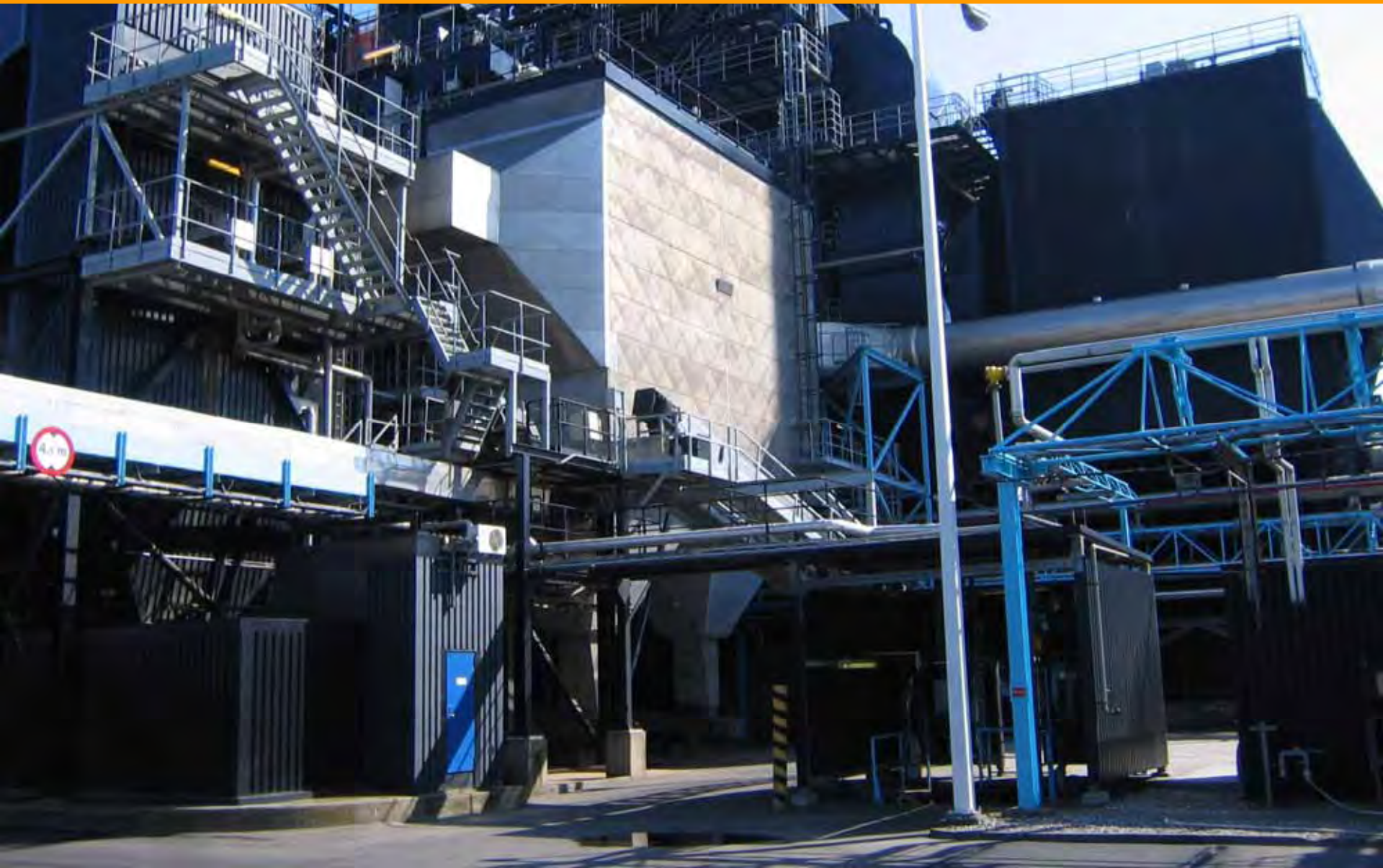


**Classification system for waste - more than 90% of organic hazardous waste is disposed of to landfill or encapsulated**



**Hazardous waste is disposed of at 2 commercially operated H:H sites and through one commercial dedicated incinerator**

# Dedicated Incinerator



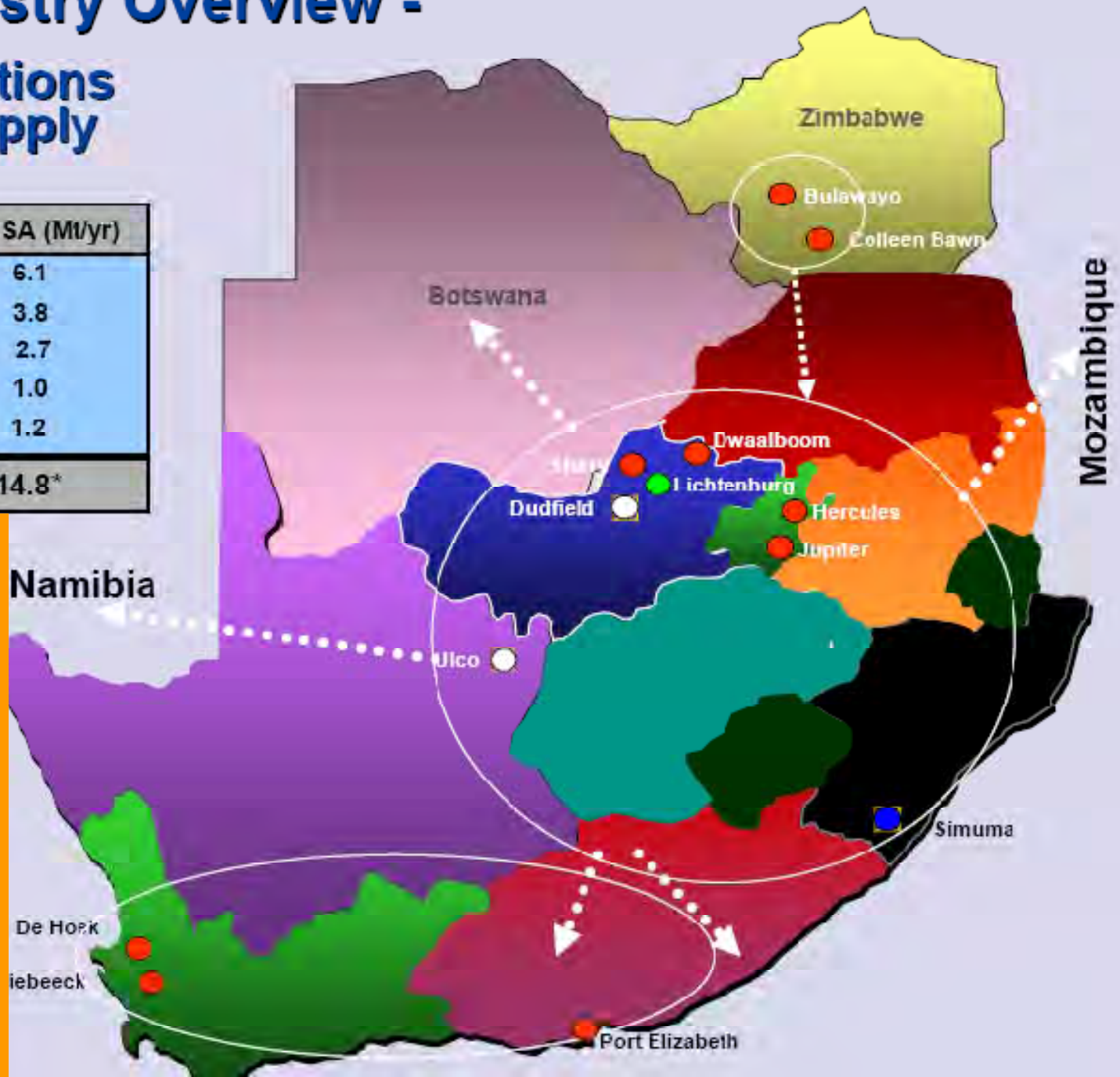


**Modern cement kiln used for co-processing**

# Cement Industry Overview -

## Factory Locations and supply

Current Cement Capacity SA (M/yr)	
● PPC	6.1
○ Afrisam (Holcim)	3.8
● Lafarge	2.7
● NPC (Cimpor)	1.0
3 <sup>rd</sup> party extenders	1.2
<b>Total:</b>	<b>14.8*</b>



**Well established & located cement industry**

# External monitoring of emissions



How does the project link to programmes on national, provincial or local level

**Directorate will be developing blending platform guideline  
– 3<sup>rd</sup> quarter of 2009**

**Directorate is currently reviewing the current waste classification system – intention is to move away from landfill bias these technologies will allow for this**

**Proposing to draft a concept and funding proposal for the development of a DRE methodology and external monitoring of POPs destruction**

**The operating guideline for the use of hazardous waste in cement kilns will be gazetted**

# **What major contribution or value was added by this project to your institution**

**The literature review undertaken through the development of this policy provided extensive new technical information**

**Working with an international expert on co-processing provided a high level of support and capacity transfer**

**The project identified new activities which are required to ensure the environmentally sound management of hazardous waste which has influenced the business plan of the Directorate**

**The consultant team provided technical assistance to the EMI officials before undertaking their inspections of the cement industry**

**Technical Information was provided to the Portfolio Committee who were debating the use of incineration and co-processing through the Parliamentary process for the promulgations of the Waste Act**

**How sustainable and replicable is this project**

**Emissions limits set in the policy will be written into an emission standards**

**EIA review guideline provides the tools for informed decision making**

**The drafting of an operating manual for the use of hazardous waste in cement kilns will ensure standard operations of kilns co-processing waste**

**Incineration as a technology is controversial – is now a policy**

# **What is the major lessons learnt that this project can teach others**

**Need to do research to support policy**

**Combination between local and international team is rewarding**

**Must tackle the difficult issues**

**Broad consultation very important**

**Present possible solutions and directions early on in the process  
focuses comments**

**Ensure that the structures of Working Group II are factored into  
timescales**

**Good to have a flexible donor who is supportive**

# THANK YOU



environment  
& tourism

Department:  
Environment Affairs and Tourism  
REPUBLIC OF SOUTH AFRICA