



A Global Overview of Waste to Energy

Metro Vancouver Waste Management Committee

November 14, 2007

NORTH AMERICA
WASTE-TO-ENERGY

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What it is NOT

- Not an excuse to “waste” – we must encourage the 3R’s before we move to the 4th R – Recovery of energy
- It is not reuse to energy – glass acts as a heat sink
- It is not recyclables to energy
- It is not the answer to all our problems in disposal and not a 100% replacement to landfills

. . . . So where does it fit?

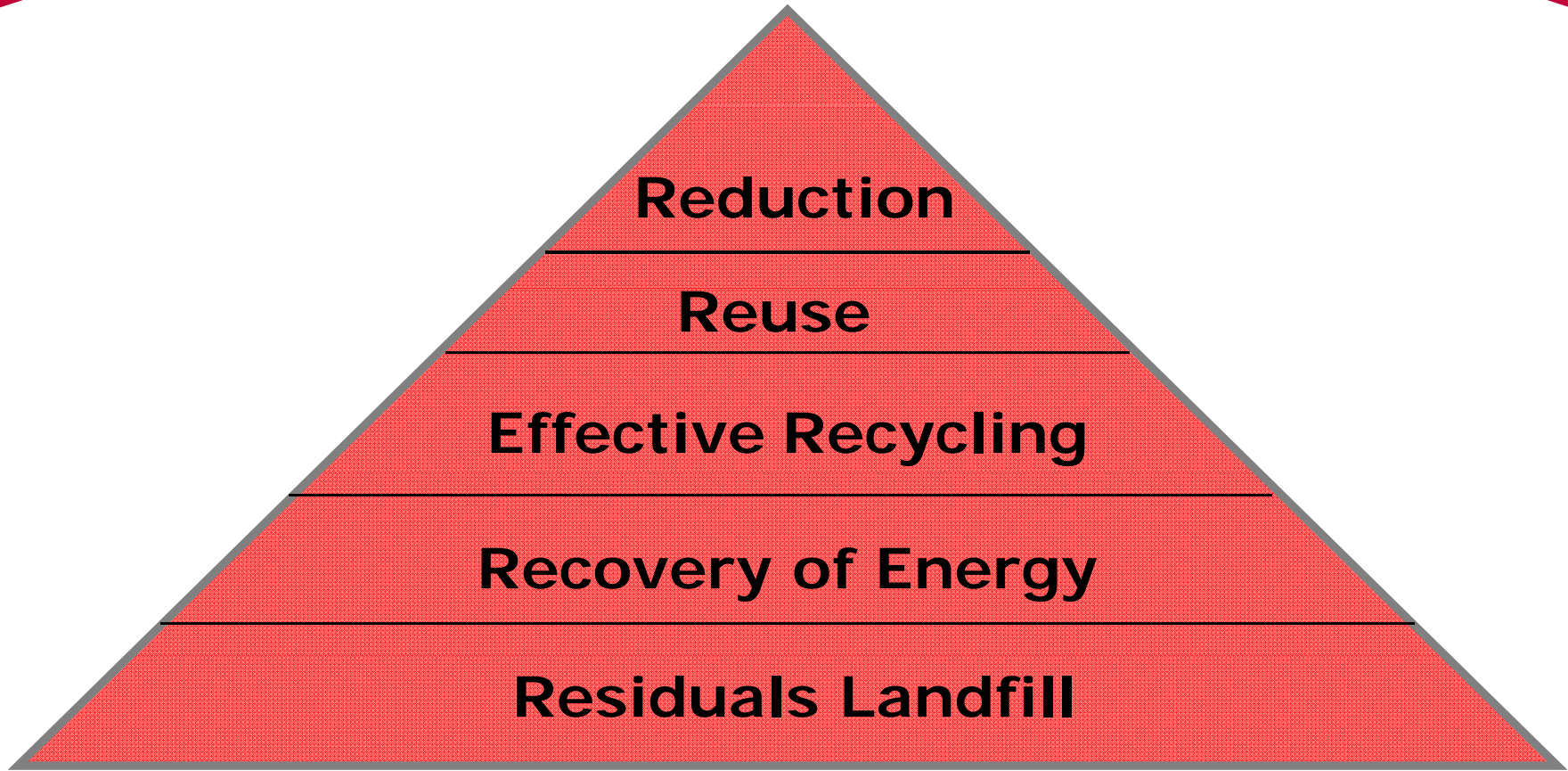
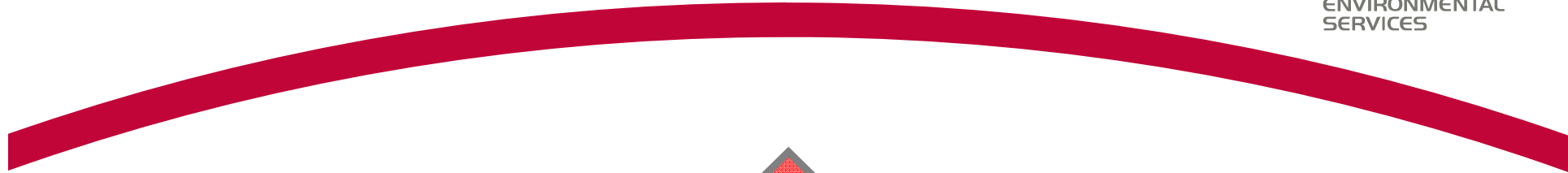
Waste to Energy – A Global Perspective



What it IS:

- An effective method of residuals disposal & recovery of energy – 90% volume reduction and firm electrical and heat production
- Has a proven track record of environmental performance
- A renewable source of energy, a sensible fuel
- A major part of an integrated Solid Waste Management Plan
- A local benefit for environmentally safe & secure disposal, energy and heat

Waste to Energy – A Global Perspective



Waste to Energy - Technologies

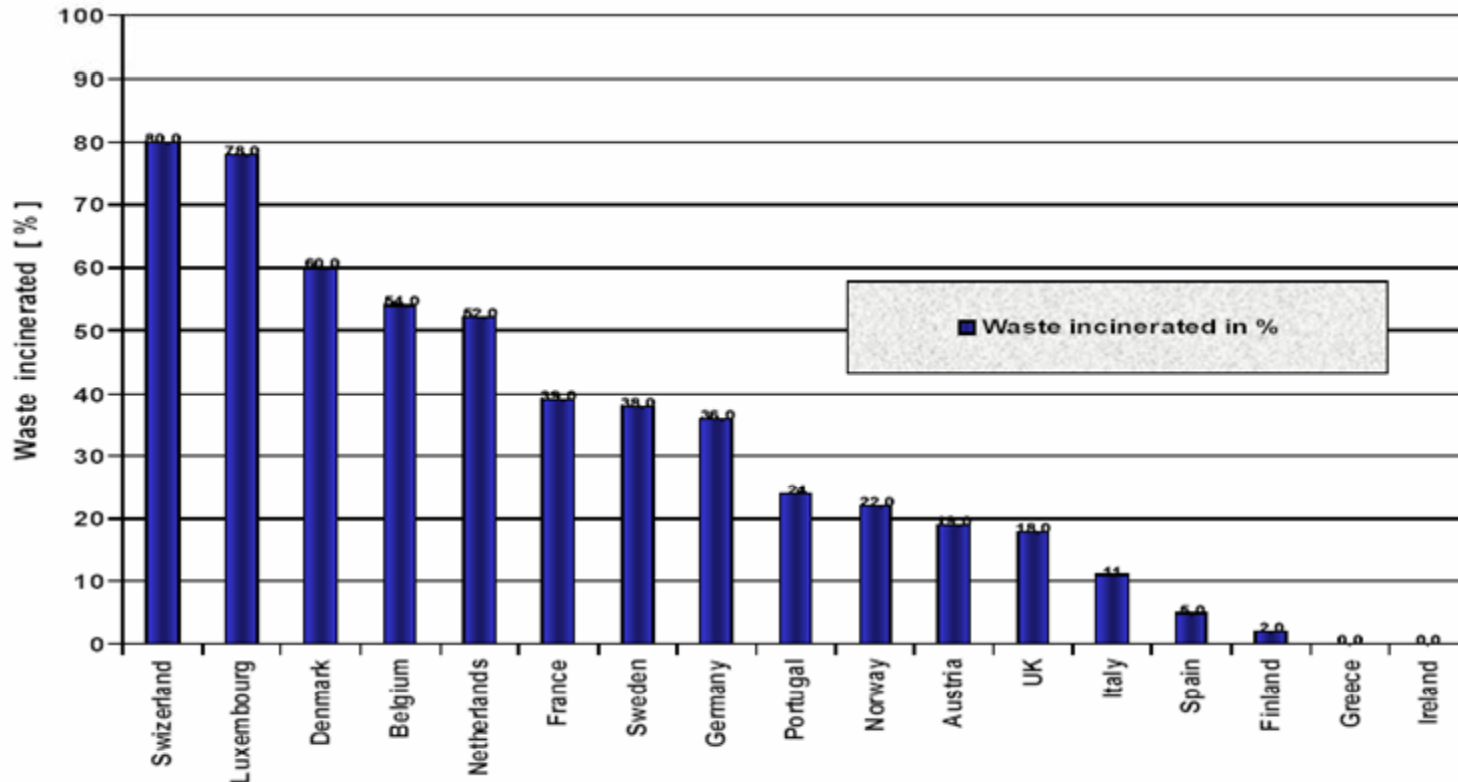


- Modular – 50 to 100 TPD
- Rotary (kiln type) combustors – 100 to 200 TPD
- Mass burn on grate – 200 to 800 TPD
- Refuse Derived Fuel (biomass) – suitable for largest due to economies of scale – 750,000 TPY
- Gasification – when and where??

MARTIN GmbH für Umwelt- und Energietechnik



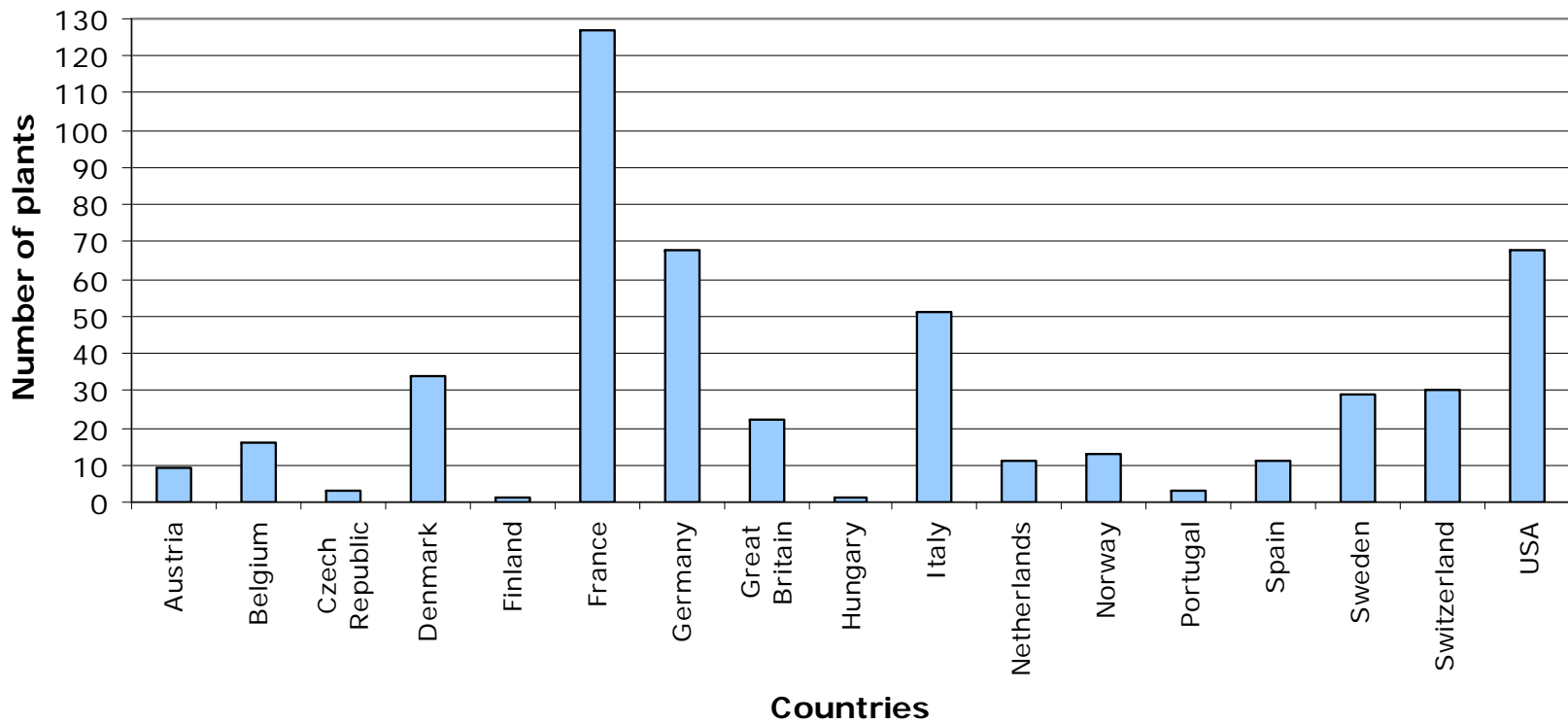
Percentage of Waste Incineration Europe 2003



07/2004

Waste to Energy - Europe

Data for the 5. edition of the ISWA Energy from waste statistics
429 waste incineration plants



Waste to Energy - Europe



- Many WTE ordered or in construction – over 30
- Driven by EU landfill directive allowing only 3 to 5% unburned carbon
 - Denmark 1997
 - Austria 2000
 - Sweden 2002/2005
 - Germany 2005
- Caution! High disposal costs of \$150 to \$200 per tonne can result if logic is not followed

European Designs – AVR Rotterdam



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European Designs – Brescia, Italy



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European Designs – Lille, France



European Designs – Rouen, France



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Waste to Energy - Asia

- Japan - some 2,000 plants and 80% WTE
- Taiwan – moving to 100% WTE
- China – largest growth area with high environmental performance criteria driven by 2008 Olympics
- Singapore – 92% WTE

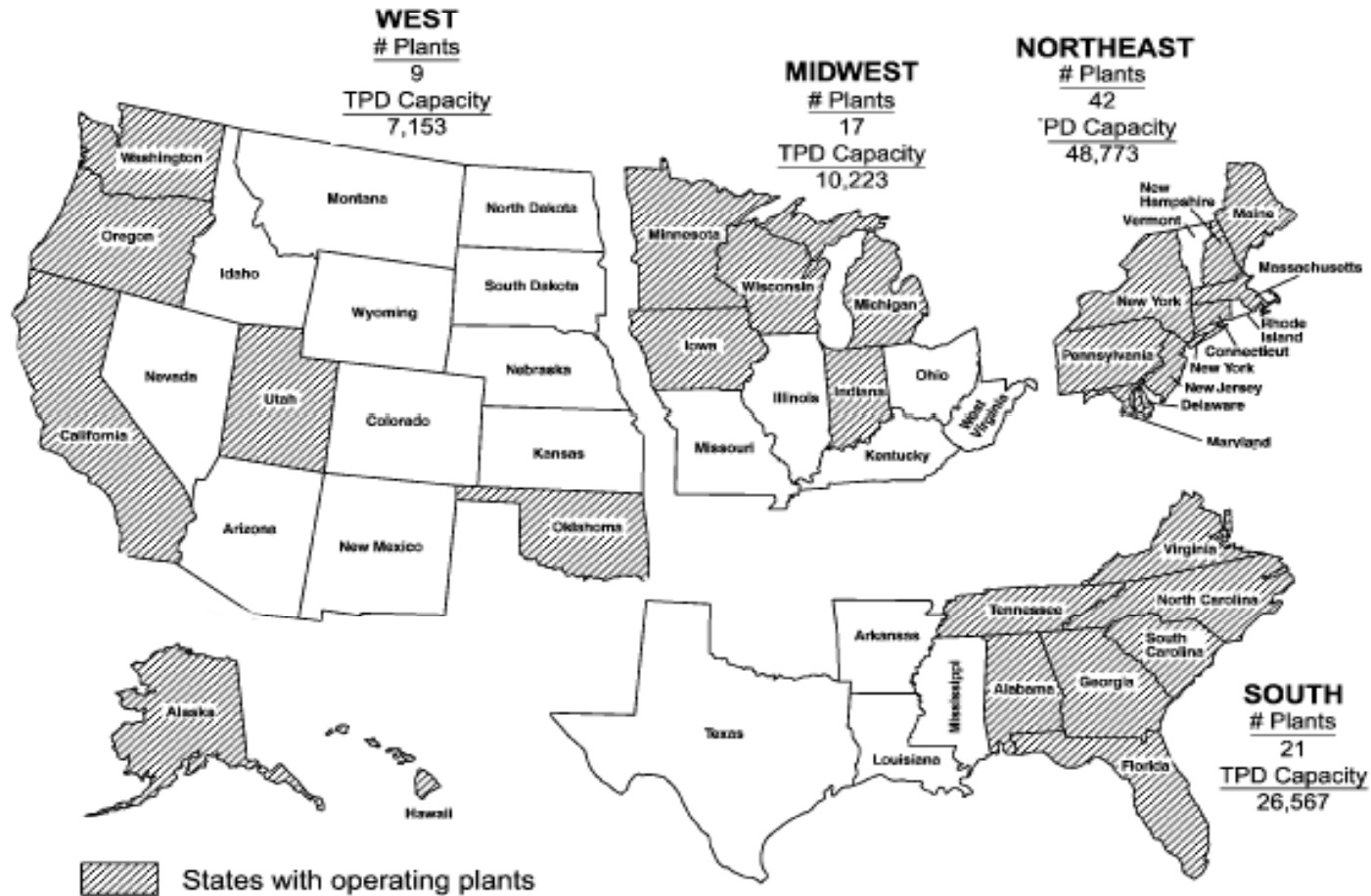


Lutsao, Taiwan



Nanshan, China

Operating WTE Plants in the U.S. – By Region



Waste to Energy - USA



RDF - Dade County, Florida

Waste to Energy – Canada

- 3 large WTEF's in Canada
- Peel County, Ontario (150 TPD)
- Only one west of Ontario – Metro Vancouver WTEF in Burnaby
- Largest are Quebec City (920 TPD) and Metro Vancouver (800 TPD) facilities
- Less than 4% MSW in Canada goes to WTE
- Slow growth in the past due to cheap land and low energy prices and little district heat infrastructure



Questions? Thank You.