



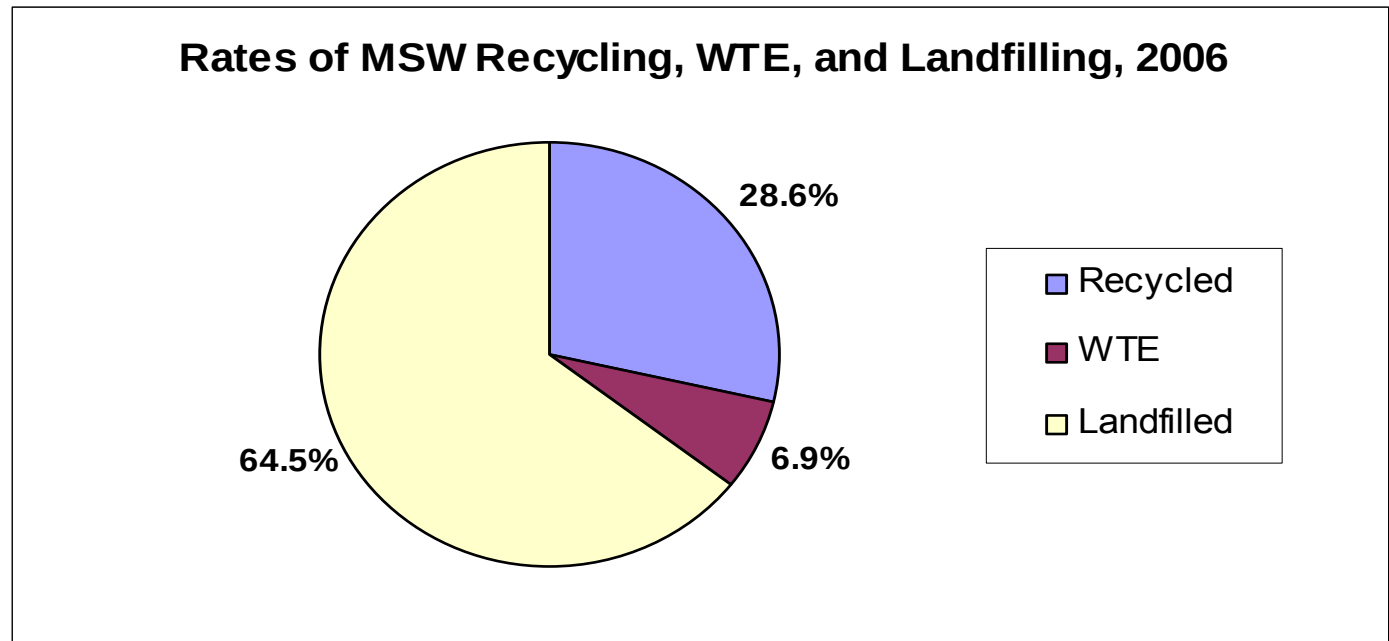
The Science, Policy & Politics of Waste

Public Policy Context and Federal Legislative Developments



Overview

- WTE: A largely untapped resource in the US: only 6.9% of our MSW is directed to WTE – 64.5% is landfilled

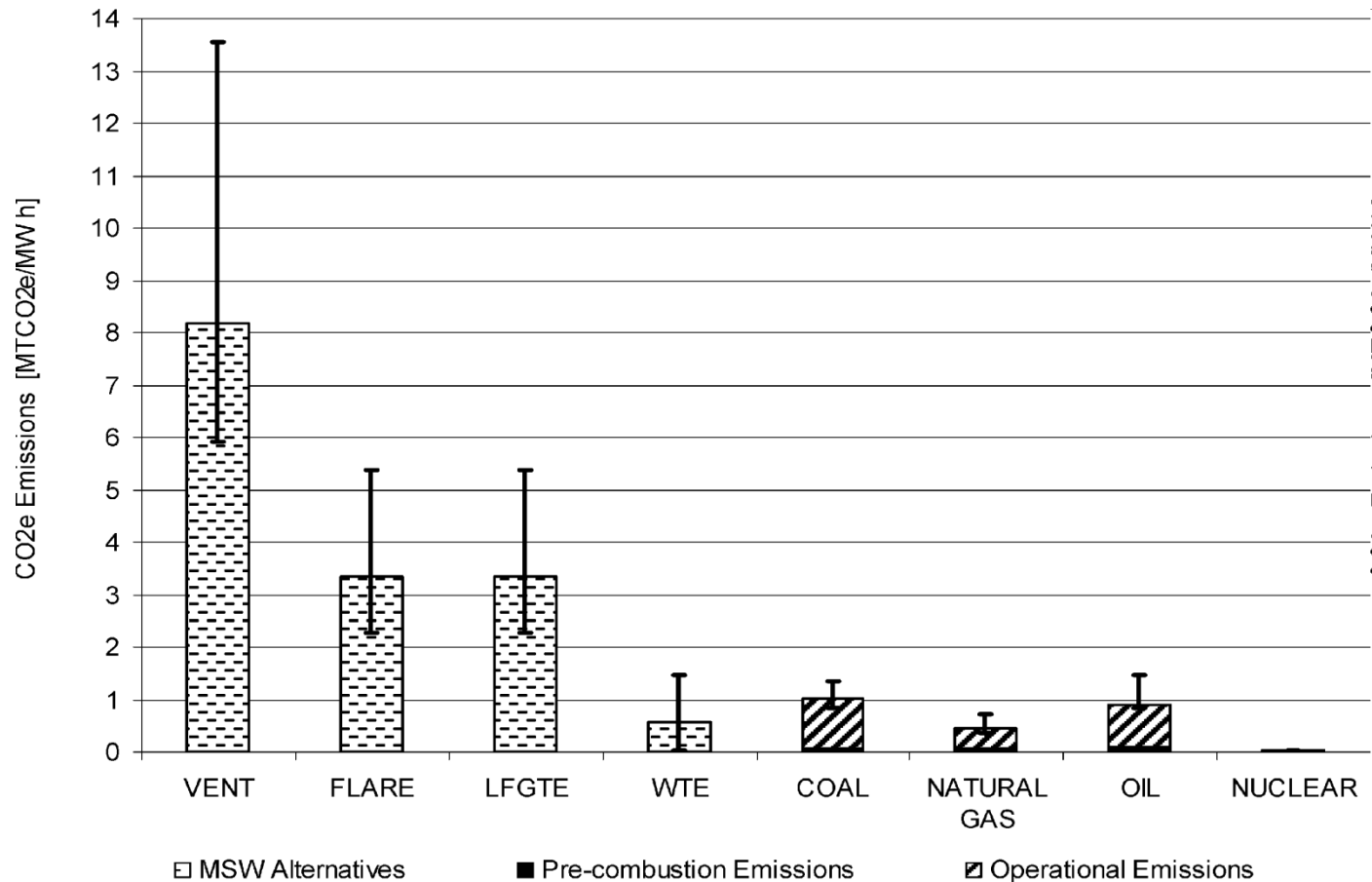


Overview (cont'd)

- ▶ WTE has far greater use in many other nations that are at least equally conscientious stewards of the environment
- ▶ As the Chief of USEPA's Energy Recovery Branch recently emphasized, "[i]f you want to have an impact on greenhouse gas mitigation, focus on MSW [because there's] nationally significant energy available from MSW combustion [and] even if you have >50% recycling, you still have a significant amount of energy to recover"
- ▶ The World Economic Forum's January 2009 report, *Green Investing – Towards a Clean Energy Infrastructure*, recognizes WTE as one of eight "key renewable energy sectors" and "particularly promising in terms of . . . abatement potential" for carbon emissions
- ▶ The Nature Conservancy ranks WTE as one of the most environmentally protective alternative energy sources
- ▶ A couple of background points

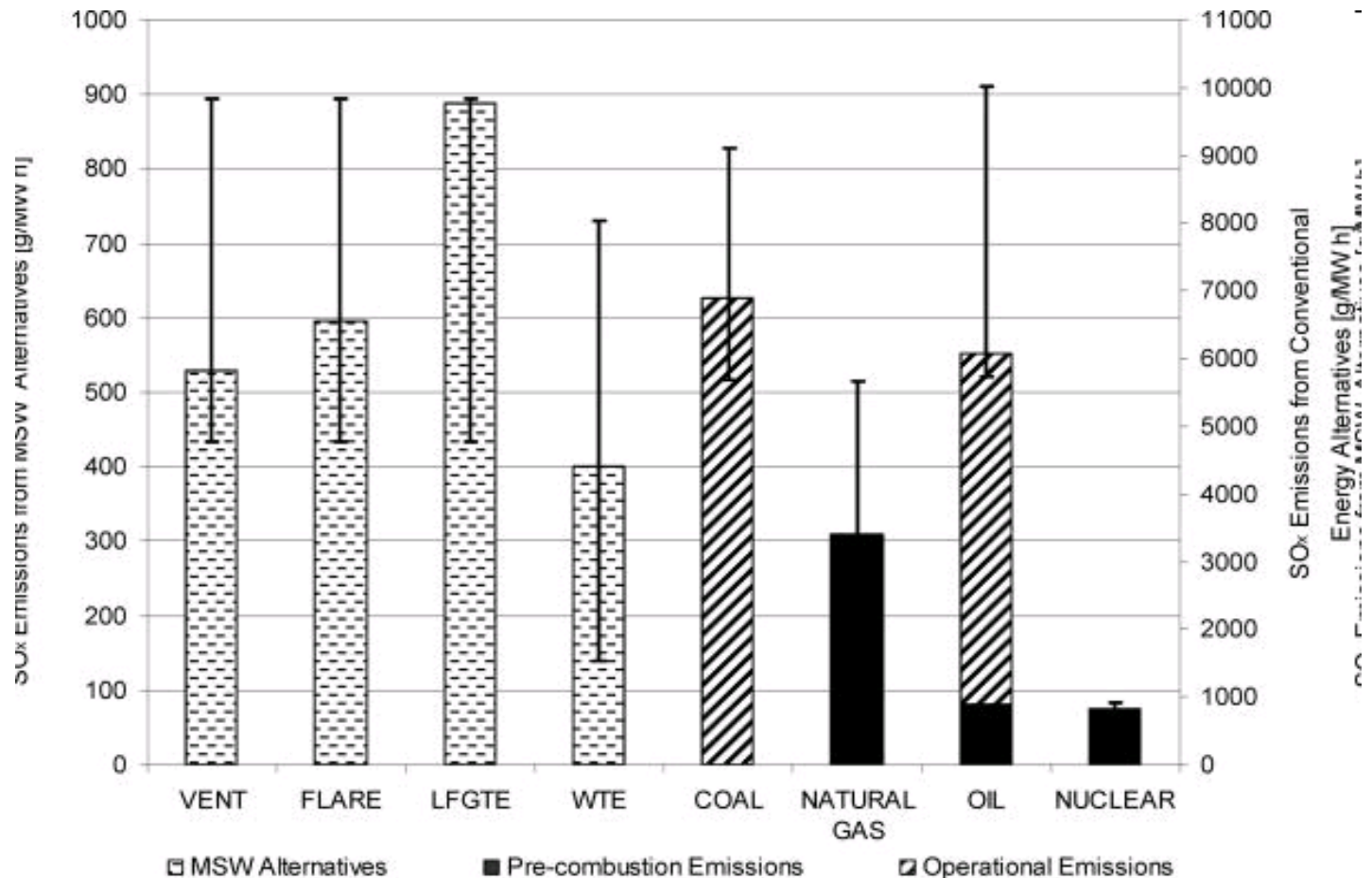
Here Are the Facts:

- Using advanced emissions control technology, WTE emissions have plummeted since the late 1980's
- WTE emissions are lower than landfill emissions for 9 of 10 major air pollutants
- Examples:



Comparison of CO₂ Equivalents

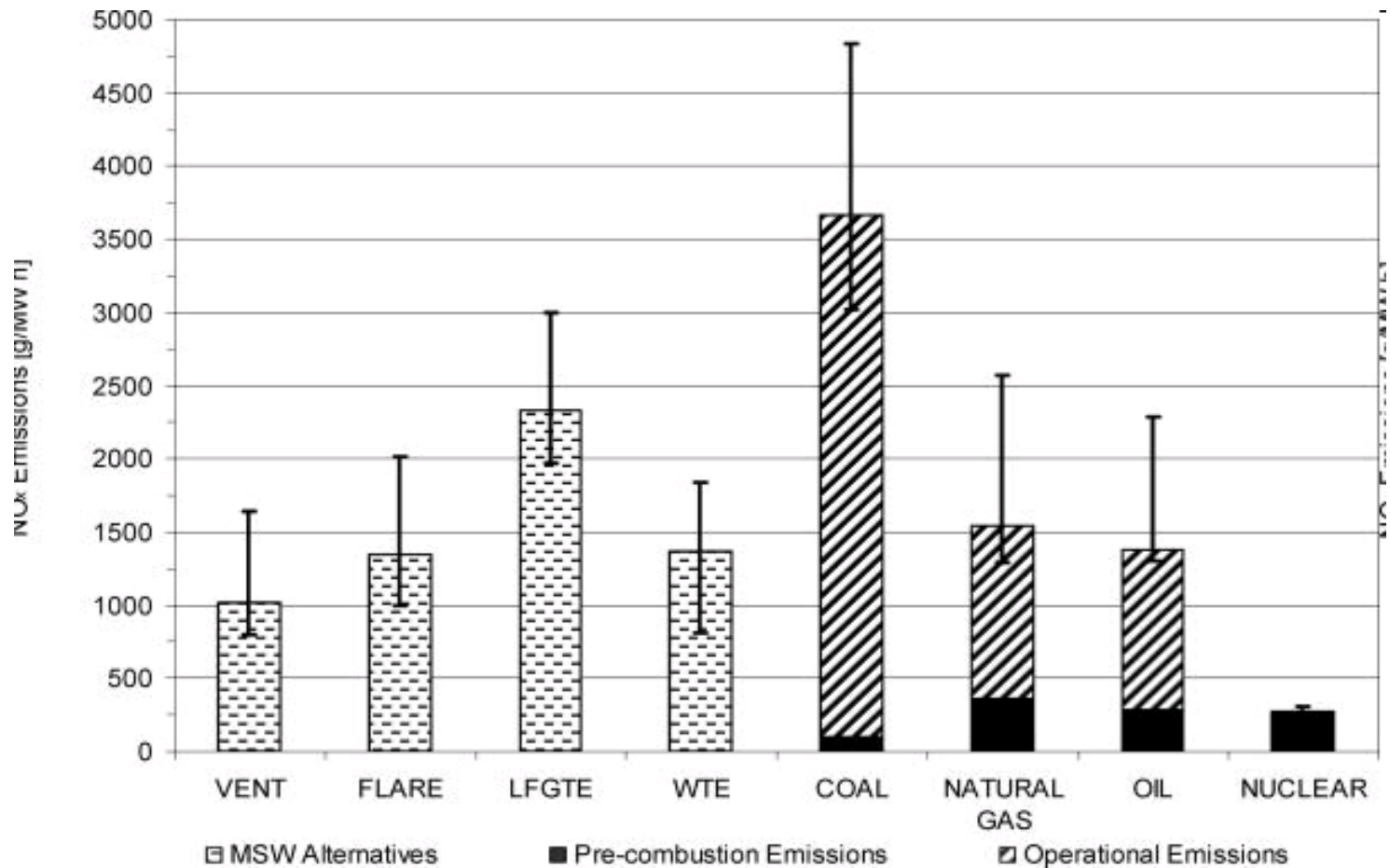
Source: P. Ozge Kaplan, Joseph DeCarolis, and Susan Thorneloe, "Is It Better To Burn or Bury Waste for Clean Electricity Generation,"
Environmental Science & Technology



Comparison of SO₂ Emissions

Source: P. Ozge Kaplan, Joseph DeCarolus, and Susan Thorneloe, "Is It Better To Burn or Bury Waste for Clean Electricity Generation,"

Environmental Science & Technology



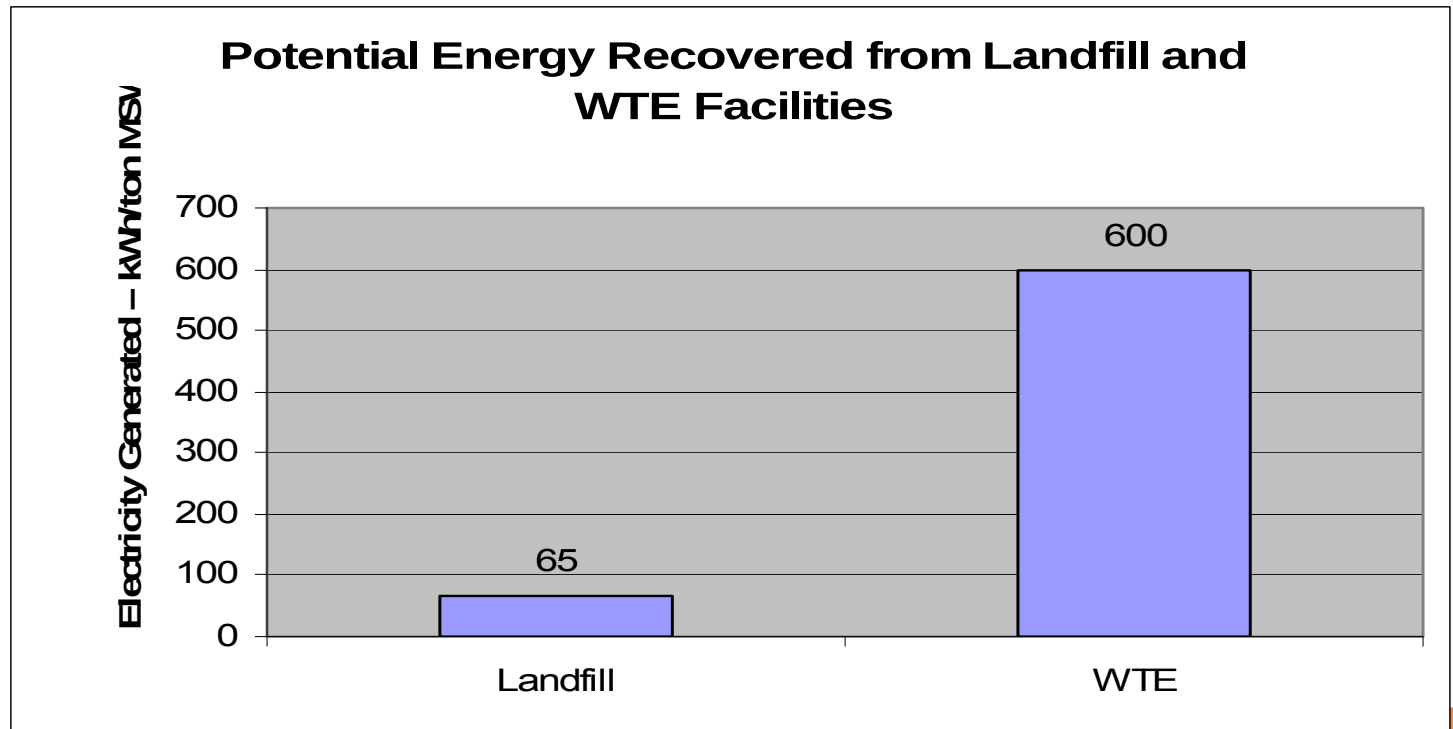
Comparison of NO_x Emissions

Source: P. Ozge Kaplan, Joseph DeCarolis, and Susan Thorneloe, "Is It Better To Burn or Bury Waste for Clean Electricity Generation,"

Environmental Science & Technology

The Facts: (cont'd)

- WTE's efficiency and reliability are clear as well:
 - WTE recovers approximately 600 kWh of electricity per ton of waste, i.e., approximately 10 times the electric energy recoverable from a ton of landfilled waste



The Facts: (cont'd)

- o WTE is base-load generation, available 24/7 and unaffected by days that are cloudy or calm
- o WTE is also a prime example of “distributed generation” that serves nearby load without the need for new long-distance transmission lines



SYCTOM
Isseane WTE Plant, Paris



The Facts (cont'd)

- USEPA: WTE “produce[s] 2800 megawatts of electricity with less environmental impact than almost any other source of electricity”
- EPA’s hierarchy for “integrated waste management” recommends waste combustion with energy recovery over landfilling (as does the European Union)
- During a recent national conference (NAWTEC17, Chantilly, Virginia, May 18, 2009), the keynote address by the Chief of the USEPA’s Energy Recovery Branch noted evolving EPA policy:
 - o The status quo – 64.5% landfilling, 6.9% WTE and about 28% recycling
 - o Paradigm shift to a “best integrated material management strategy” with 45% recycling, 10% landfilling and 45% WTE

The Facts – Mitigation of Climate Change

- Background – King County's Draft 2009 Solid Waste Management Plan
 - o Climate change is one of the nation's leading environmental concerns
 - o The need to address climate change impacts is one of six primary policies that underlie the Plan, and
 - o Proper solid waste management plays a significant role in reducing greenhouse gas (GHG) emissions

Mitigation of Climate Change (cont'd)

- WTE's role in reducing GHG emissions is widely recognized
- Using life-cycle analysis, USEPA's solid waste management planning methodology addresses the 3 ways in which WTE reduces GHG emissions:
 - o Generating electricity and/or steam without having to use fossil fuels
 - o Avoiding the potential methane emissions that would result if the same waste was landfilled, and
 - o Recovering ferrous and nonferrous metals, which avoids the additional energy consumption that would be required to produce the same metals from virgin ores

Mitigation of Climate Change (cont'd)

- EPA analysis also shows that WTE yields the best results (compared to landfills) in terms of maximum energy recovery and lowest GHG and criteria pollutant emissions
- One ton of CO₂e (carbon dioxide and equivalent emissions) is widely recognized as being avoided for every ton of MSW directed to a WTE facility rather than landfilled (comparison based on a modern landfill with methane recovery and reuse)
- The Intergovernmental Panel on Climate Change emphasizes WTE's dual benefits of (i) offsetting fossil fuel combustion and (ii) avoided landfill methane emissions

Mitigation of Climate Change (cont'd)

- The Kyoto Protocol's Clean Development Mechanism approves WTE as a source of tradeable GHG emission reduction credits that displaces electricity from fossil fuels and avoids landfill methane emissions
- Similarly, the Feb. 20, 2007 joint statement from the Global Roundtable on Climate Change (convened by Columbia University's Earth Institute) identifies WTE as an important means to reduce carbon emissions from fossil fuel-based electricity and methane emissions from landfills (the joint statement's signatories range from Dr. James Hansen, NASA Goddard Institute for Space Studies, to Environmental Defense)

Mitigation of Climate Change (cont'd)

- Let's put this in context:
 - o King County's Draft 2009 Solid Waste Plan notes the gas recovery-reuse system in place at Cedar Hills landfill avoids CO₂e emissions equal to 22,000 passenger cars
 - o But using the County's 2008 disposal volume at Cedar Hills, 930,000 tons, and an average of one ton of CO₂e avoided per ton of MSW processed at a WTE facility vs. landfilled, the resulting GHG reduction is equivalent to removing **195,000 passenger cars** from King County's roads, or about one car in six
 - o Add Seattle's annual waste disposal volume (438,000 tons): that becomes **287,000 passenger cars** or almost one car in four

The Facts – WTE Encourages Recycling

- WTE communities outperform non-WTE communities in recycling
- WTE communities' recycling rates are typically at least 5 percentage points above the national average and in some cases lead the nation in recycling
- Confirmed by a recent (June 2009) national survey that conservatively calculated (i.e., understated) the recycling rate for WTE communities

Recycling and Waste-to-Energy: Are They Compatible?
2009 Update, Eileen Brettler Berenyi, Ph.D (June 2009)
Governmental Advisory Associates, Inc., 599 Riverside
Avenue, Westport, CT 06880

- Recycling rates are driven by state recycling policies that apply equally to WTE and non-WTE communities, and WTE communities' recycling rates are generally higher than non-WTE communities in the same state

WTE Encourages Recycling (cont'd)

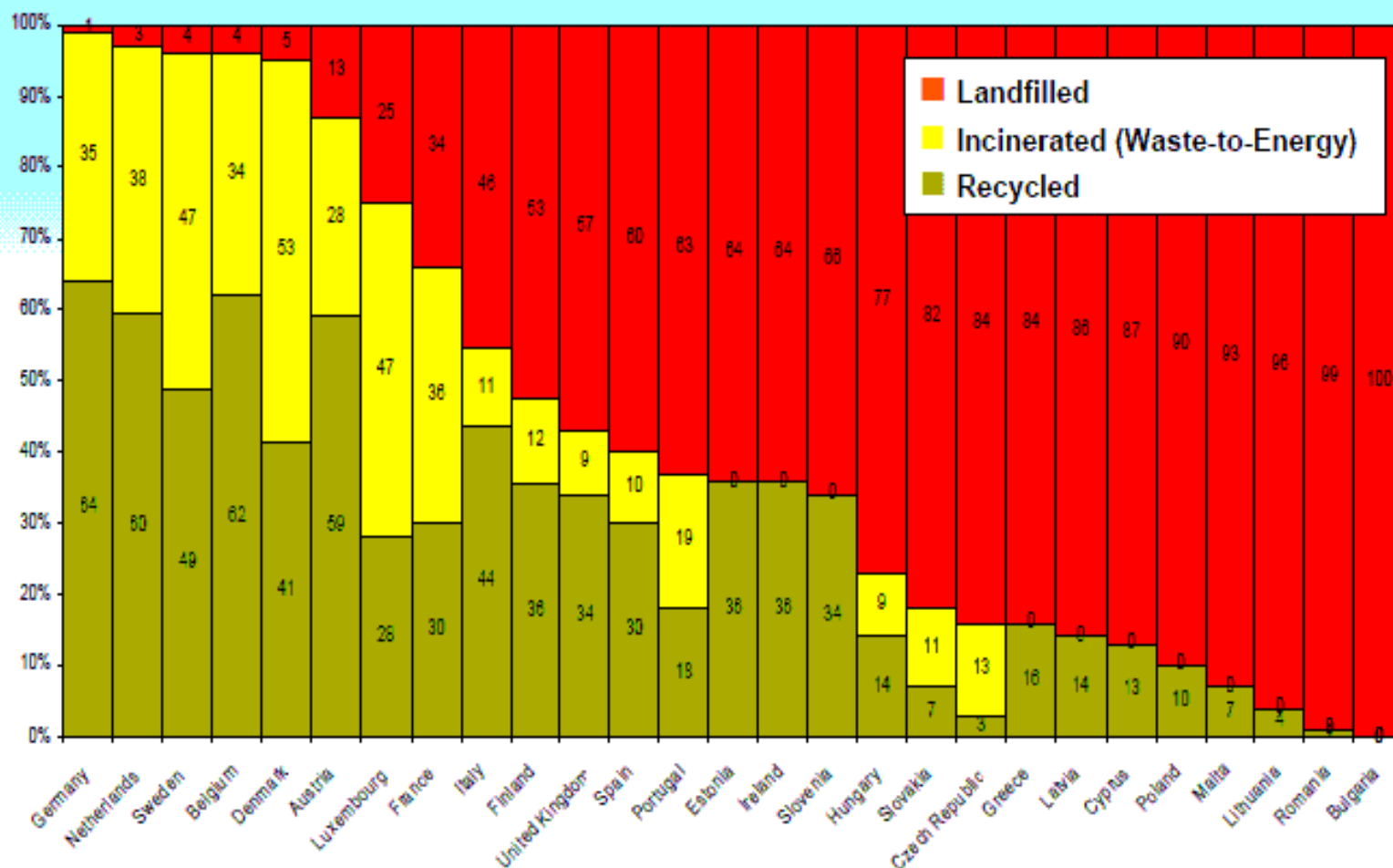
- State laws and policies also discourage diversion of recyclable materials to combustion in a WTE facility:
 - o For example, an Oregon county using WTE cannot “take any action that would hinder or discourage recycling activities in the county.” Ore. Rev. Stat. § 459.153
 - o That statute is focused on WTE-reliant Marion County, which consistently achieves one of the highest recycling rates in the nation – more than 58.4%, and the highest in Oregon

<http://www.deq.state.or.us/lq/pubs/docs/sw/2008MRWGRatesReport.pdf>

WTE Encourages Recycling (cont'd)

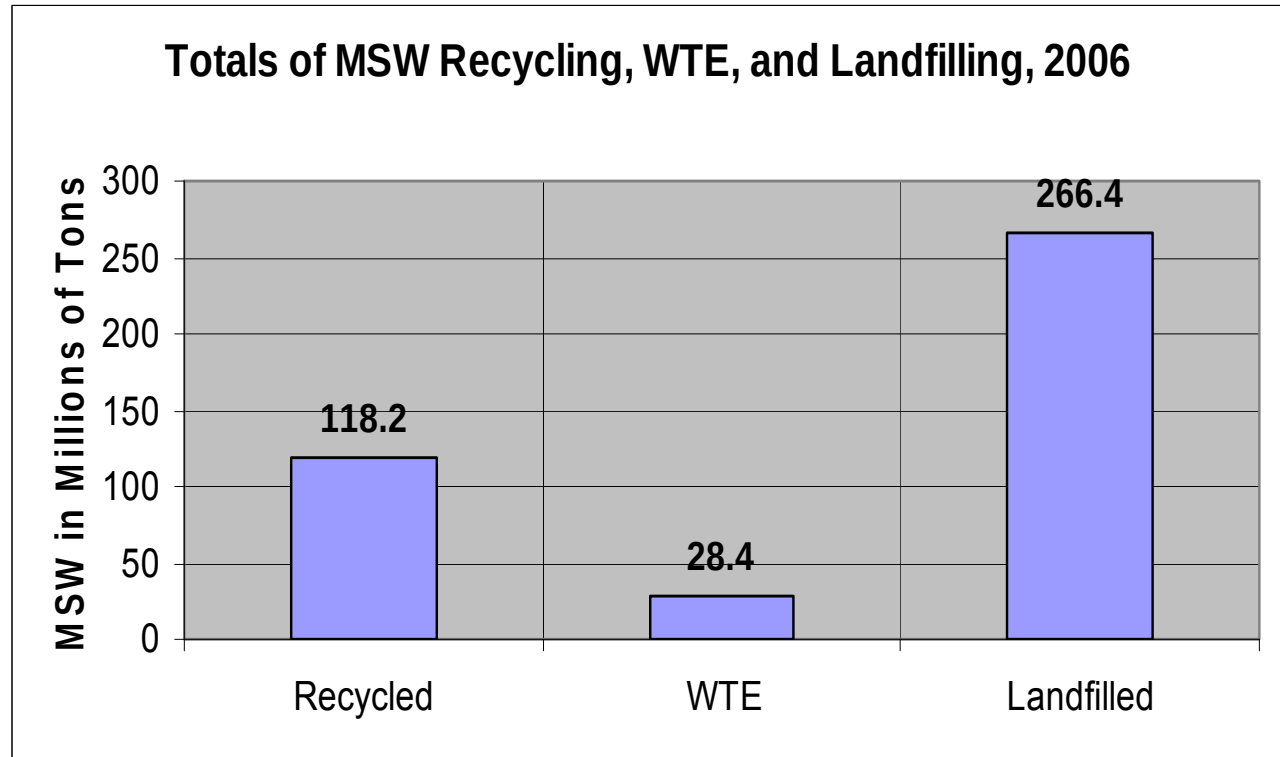
- The track record in Europe
 - o European countries with greatest reliance on WTE also have the highest recycling rates – examples:
 - o Germany – 64% recycling, 1% landfilling and 35% WTE
 - o Sweden – 49% recycling, 4% landfilling and 47% WTE

EUROSTAT 2007, MSW



WTE Encourages Recycling (cont'd)

- Compare EU data to the U.S.



WTE Encourages Recycling (cont'd)

- “We must avoid false choices. It is not energy recovery v. recycling, it is energy recovery v. landfilling. We need energy. We don’t need landfills.”

Keynote address, NAWTEC17, Chantilly, Virginia,
May 18, 2009 (Chief, Energy Recovery Branch, USEPA)

Pending Federal Legislation: Energy-Climate Change

- House of Representatives
 - o June 26, 2009 – approves H.R. 2454, the American Clean Energy and Security Act
 - o Combined energy and climate change bill
 - o Federal RES: starts at 6% in 2012 and steps up to 20% in 2020
 - o WTE qualifies as “renewable electricity” and for “Renewable Energy Credits” (RECs)
 - o RECs have considerable value – a recent report by the National Renewable Energy Laboratory conservatively estimates REC values of \$22 per MWh and higher
 - o Climate change: WTE is not subject to the “carbon cap” or the obligation to have CO2 allowances

Pending Federal Legislation (cont'd)

- o Humorous aside – A proposed amendment would have designated the Presidio in House Speaker Pelosi's district as an underground storage facility for carbon dioxide!
- Senate – energy legislation
 - o July 16, 2009: Senate Energy and Natural Resources Committee approved RES as part of a broad energy bill, S. 1462, the American Clean Energy Leadership Act of 2009
 - o Senate RES: starts at 3% in 2011 and steps up to 15% in 2021
 - o All WTE-produced electricity qualifies as renewable
 - o Comparable state RES (e.g., Oregon)

Pending Federal Legislation (cont'd)

- Senate – climate change legislation
 - S. 1733 (Sens. Kerry & Boxer) – WTE not regulated under carbon cap, etc. (same as H.R. 2454)
 - New alternative: Sens. Kerry, Lieberman and Graham Introduction – week of April 19
 - “Cap and refund” program – starts with electric utilities in 2012
 - “Cap and refund” phased-in for manufacturing sectors starting in 2016
 - “Linked fee” for transportation fuels
- Energy-only alternative?
- Prospects for comprehensive energy and climate change legislation – Senate outlook

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Thank you.....Questions

