Overview

- Introduction to the problem
- Key Lessons Learned
- Examples of Alternative Waste Facilities
- Key Findings
- Comparative Analysis
  - Application to New York
- Conclusion
- Questions
Introduction

- NYC residents: 13,000 tons per day
- No local disposal facility
- Export by diesel truck
- Research on 5 cities’ alternative solid waste management strategies
- Interesting results…
Key Lessons Learned

- Politically feasibility in New York
  - Work with communities
- Alternative facilities exist around the world
- Process significant volume of waste
- Environmental advantages
- Cost effective
  - Can be financed through traditional mechanisms
Examples of Alternative Waste Facility Siting

- **Akita City, Japan:** Nippon Steel Shaft-type Gasification Facility
- **Barcelona, Spain:** Ecopark 2 Anaerobic Digestion Facility
- **Honolulu, Hawaii:** Hawaii Medical Vitrification Facility & HPOWER Waste to Energy Facility
- **Newmarket, Ontario:** Organic Waste Processing Facility
- **Middletown, New York:** Masada Oxynol LLC, Orange Recycling and Ethanol Production Facility
Key Findings

- **Barcelona, Spain**: *Anaerobic Digestion*
  - Processes 19% of Barcelona’s waste stream
  - Proactive community relations
  - Use of design for aesthetic appeal
  - Competitive cost per ton: $43

- **Akita City, Japan**: *Gasification*
  - Plant owned by Akita City
  - Biannual meetings with town representatives and the City Department of Environment
  - Technology used in 26 other plants in Japan and South Korea
Key Findings, Continued

- Honolulu, HI:
  - **Gasification**
    - Treats only medical waste
    - Generates and sells electricity from fuel gas
    - Pilot project treats up to one ton per day

- **Waste-to-Energy (Incineration)**
  - Honolulu increased this plant’s capacity rather than landfilling or constructing a gasification facility
  - Incineration accepted as an alternative to landfilling
  - Generates electricity and sells it to a grid
  - Competitive cost: $50/ton
Key Findings, Continued

- **Newmarket, Ontario: Anaerobic Digestion**
  - Sited in an industrial zone 30 miles north of Toronto
  - Odor is a problem, exists due to construction flaw
    - Primary source of community opposition

- **Middletown, NY: Recycling + Waste-to-Ethanol**
  - Secured all State, Local, and Federal environmental permits
  - Proactive community relations
  - Private ownership and operation
  - Competitive cost: $65/ton
  - CEO Daryl Harms passed away
Comparative Analysis
New York City’s Challenges

- High volume of waste
- Low government credibility on waste management issues
- High competition for land
- Political contention over new construction projects
Volume of Waste Processed

- Existing facilities around the world process significant volumes of waste
  - Scalable technologies
  - Treat a portion of New York City’s waste

- Waste-to-energy incineration processes high volume of waste
  - 67% of Japanese waste: incineration
  - Gasification in response to concerns over emissions
Costs

Alternative facilities studied

- Cost per ton of disposal
- Capital costs of new facility construction
  - Technology is proven and attracts private investment
  - Traditional financing mechanisms
- Large capital investment
  - Might be economically viable compared to current practices
## Cost Comparison

<table>
<thead>
<tr>
<th>City</th>
<th>Technology</th>
<th>Cost per ton</th>
</tr>
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<tbody>
<tr>
<td>New York City</td>
<td>Landfilling</td>
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<tr>
<td>Barcelona, Spain</td>
<td>Anaerobic Digestion</td>
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<td>Gasification</td>
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<td>Middletown, New York</td>
<td>Waste-to-Ethanol</td>
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</tbody>
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*New York City Independent Budget Office 2004, brought to 2005 dollars
Environmental Considerations

- Lower emissions
  - Sophisticated control technologies not available to landfills

- Clean power source
  - Products like biogas and ethanol are cleaner to burn than fossil fuels

- Substantial reduction in volume of waste to landfill
  - Up to 90% by volume
Siting

- Possibly the biggest challenge
- Location, location, location
  - Existing waste management sites
  - Industrial zoned lands
- Urban/rural siting options
  - Newmarket
  - Barcelona
Community Relations

- High transparency
  - Gain community trust and support
- Community involvement
  - Influence over facility design and construction
- Regular forum for communication and complaints
- Facility image
- Education
- Environmental Groups
Conclusion

Application to New York

- Financial feasibility
- Reasonable volume of waste processed
- Environmental advantages
- Politically challenging
Team Members:

Gabriela Alarcón, Shadan Azali, Erin Cooke, Karen DiPaulo, Adrian Hill, Nicole Markarian, Kazuhiko Muto, Devika Pant, James Rose, Palitja Woodruff, and Kateryna Wowk

Thank You.