

**2013 Yancheng International  
Environmental Protection Industry Fair  
Lessons and Trends from the USA**



**18 November 2013**

Presented by  
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Principal, CRMC



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Environmental Protection Industry Fair  
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**Thank you to our hosts and supporters**

- *Environmental Protection Department,  
Jiangsu Province*
- *People's Government of Yancheng City*



MIT Clean Energy Prize

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## **CommonWealth Resource Management Corporation**

- Advisors in the solid waste industry since 1991
- Facilities in the presentation
  - Greater New Bedford Landfill Gas Utilization Facility (own and operate since 2005)
  - North Country Landfill Gas Utilization Project (owned and operated until 2011)
  - Penobscot Energy Recovery Company (oversight role since 1991)
  - Misc. equipment per Van Dyk Recycling Solutions, representing Bollegraaf, Lupo and TITECH

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## USA: 50+ Years of Experience with Environmental Protection

1962	Publication of <u><i>Silent Spring</i></u>
1970	US Environmental Protection Agency is formed; Clean Air Act becomes law.
1972	Clean Water Act becomes law.
1976	Solid waste act (RCRA) becomes law.
1980	Hazardous waste clean-up act (CERCLA or “Superfund”) becomes law.

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1920s



2011

Pittsburgh, PA, USA

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1980s



2011

Charles River, Boston, MA, USA  
Had been closed to swimmers since 1955.

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## Products from solid waste

Raw materials



Grand Central  
Recycling, metro Los  
Angeles, CA. Van Dyk  
Recycling Solutions

Electricity



Old landfill

Vehicle fuel



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Environmental protection  
measures can bring results  
that we can see!

With work, technology,  
cooperation and time, we can  
improve our environment!



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## Phases of Environmental Protection

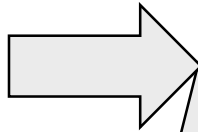
	<b>Phase</b>	<b>Results</b>
1	Find and respect impacts.	Set first goals and standards Assign responsibility Begin enforcement
2	Control impacts.	Apply control technology Manage costs and secondary impacts
3	Avoid impacts. Pursue sustainability.	Work together to refine and improve system efficiency. Create secondary benefits

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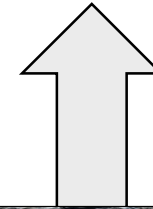
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## Solid waste impacts

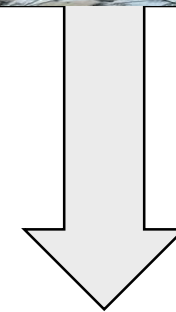
*Birds,  
rats, etc.*



*Methane gas and  
odors into the air*



*Metals and  
organics into  
water resources*

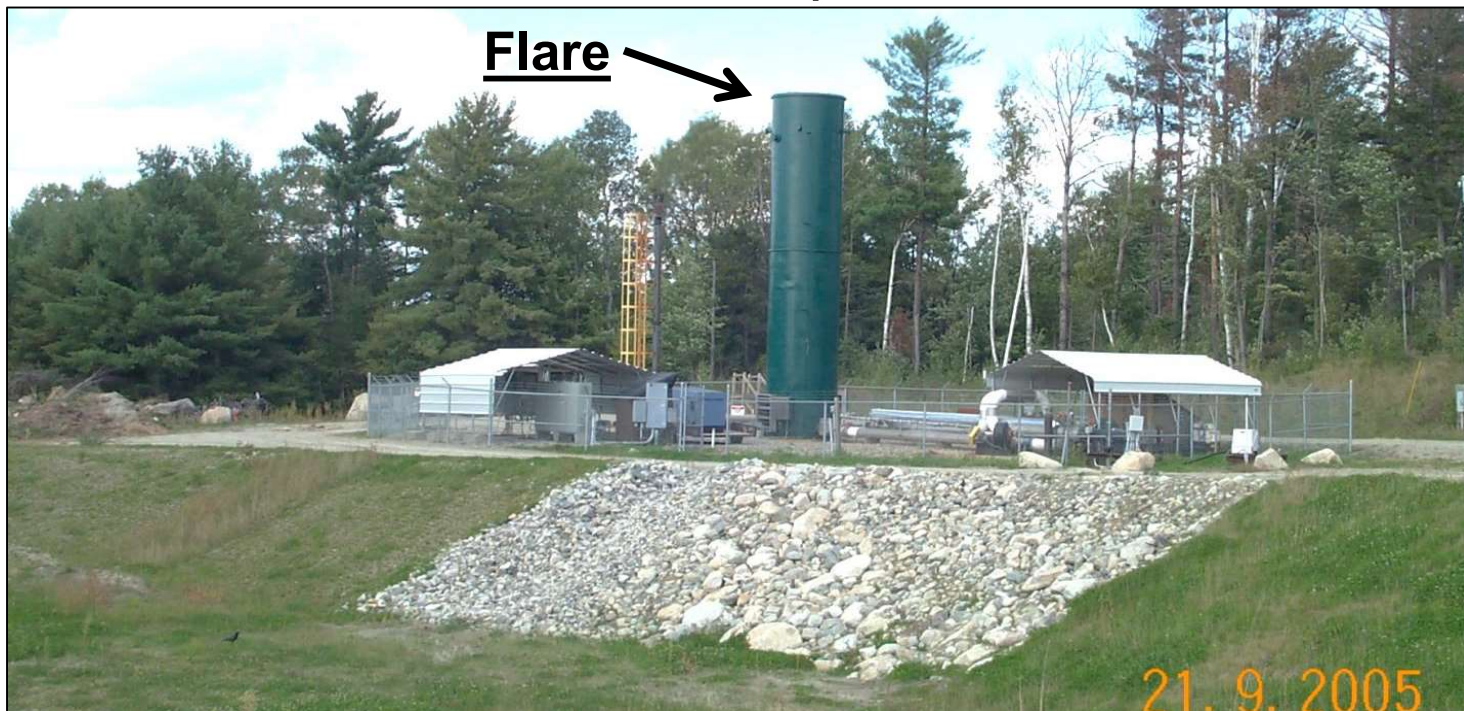


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## **Control landfill impacts**

- *Collect methane. Burn in the flare.*
- *Collect waste water. Evaporate in the flare.*



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**Control landfill impacts. Create secondary benefits. Burn methane to make electricity**



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**Avoid landfill impacts.** *Collect waste items separately for special handling; tires and car waste, refrigerant coils, scrap metal, paint, electronics, etc.*



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## **Create secondary benefits.**

*Process some waste separately into products.*



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## **Avoid landfill impacts**

- *Close the landfill when at capacity*



Westford Street Landfill, Lowell, MA, USA, Closed 1996.

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**Create secondary benefits.**

*Use the landfill area after it is closed.*





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**Avoid landfill impacts. Create secondary benefits.** *Burn waste. Make electricity. Bury ash.*



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**Control impacts.** *Receive waste inside a building. Remove dangerous items.*



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**Control impacts.** Remove glass and grit and small batteries before burning.



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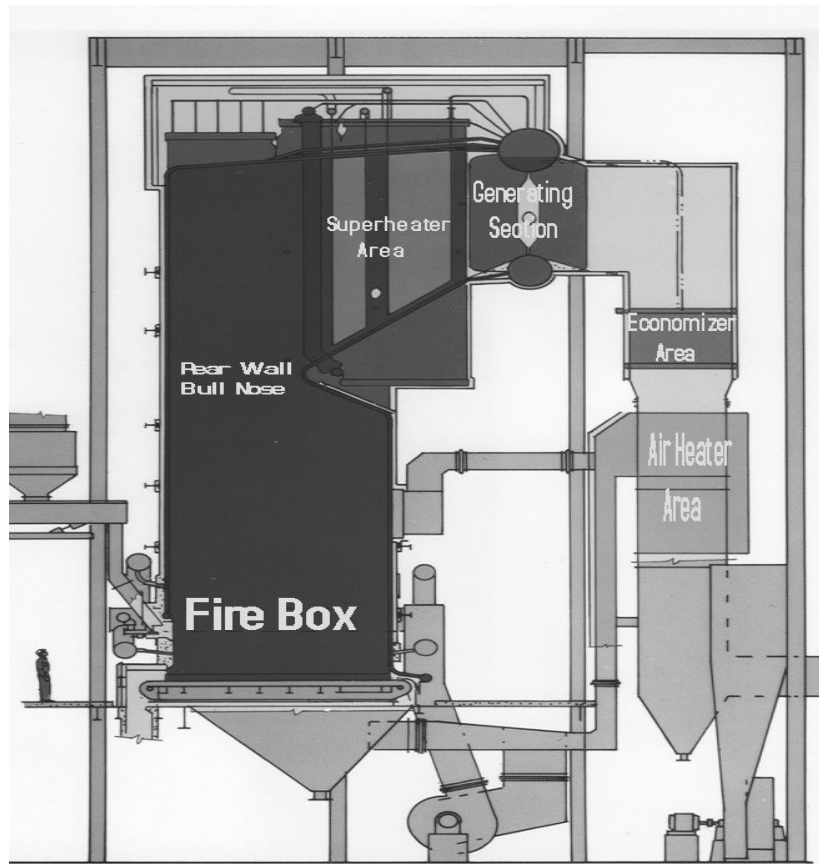
**Control impacts. Create secondary  
benefits. Make fuel.**



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**Control impacts. Create secondary  
benefits. Burn fuel efficiently to make steam.**



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**Create secondary benefits.**  
*Make electricity at a large scale.*

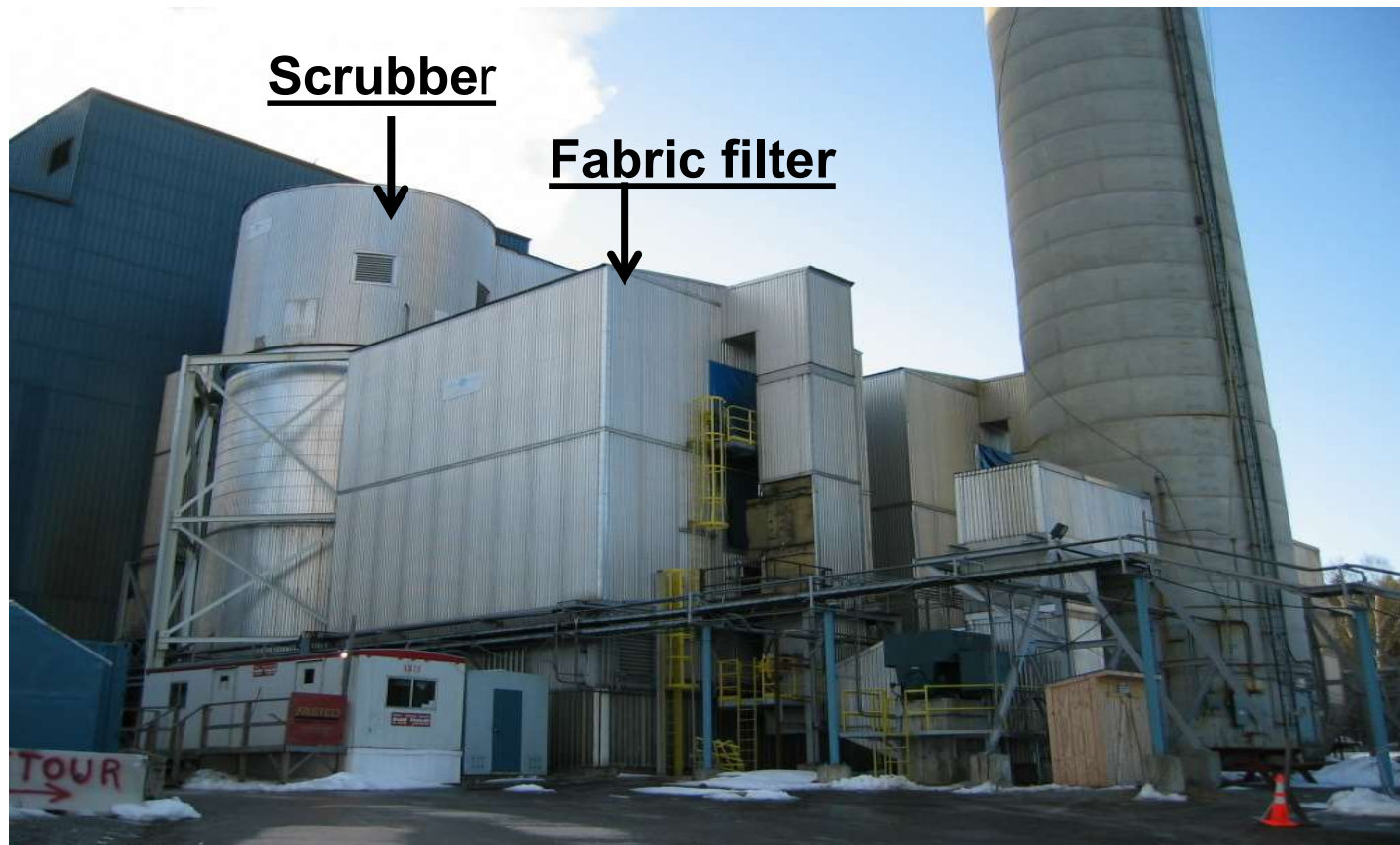


25-MW turbine-generator, PERC, Orrington Maine, USA, 1988.

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**Control impacts. Manage secondary impacts.**



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## **Emerging trends: integrate the collection systems and the processing system**

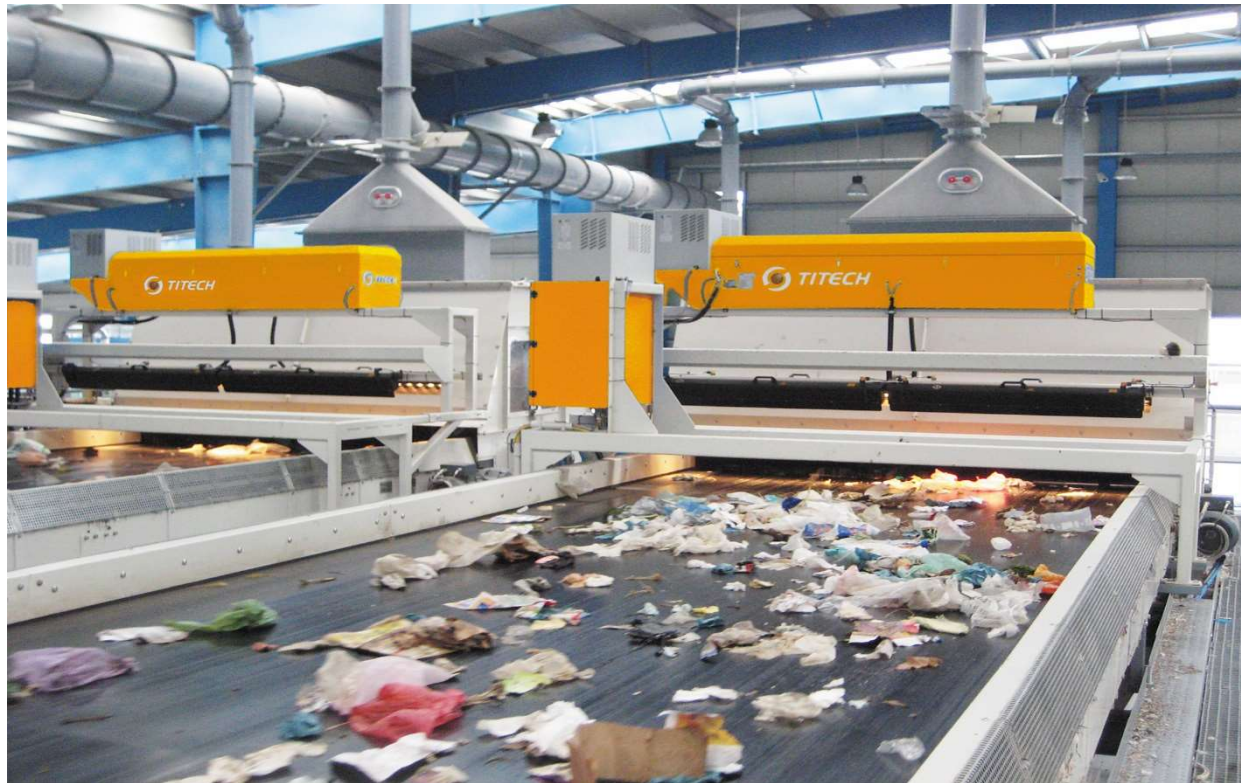
- *Mixed collection with mechanical-biological treatment (MBT) - Europe*
- *Wet-dry collection - Canada, Europe*
- *Single-stream recycling – USA, Canada*
- *Dedicated parallel recycling systems (beverage containers, metal, paint, glass)*
- *Returns to the manufacturer (batteries)*



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## *New technology: Near-infrared separation*



25 *Sort plastics and paper by type. TITECH, Van Dyk Recycling Systems.*

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## *New facilities: Single-stream recycling*



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## *New technology: processed engineered fuel*



*Removes non-combustibles and wet items.  
Van Dyk Recycling Systems.*

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## **Challenges for the future: how do we**

- 1. Control and avoid direct and secondary impacts?*
- 2. Integrate existing and new technologies with outside systems to create the most benefits?*
- 3. Succeed at a pace and scale that meets the challenge?*

*We are here today at the EPIF  
to learn about answers!*



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**Thank you for present work.**  
**We look forward to your future achievements!**

