



Plastics in the Marine Environment



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SWANA - NYS
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Today's Topics

- **Plastics are good, but....**
- **Marine Debris and Litter Recovery Programs**
 - Global, national and local
 - CGI, Fishing for Energy, Litter to Light
- **A Solution**



How Much?

Columbia University, Earth Engineering Center, Aug 16, 2011

“Energy And Economic Value Of Nonrecycled Plastics (NRP) And Municipal Solid Wastes (MSW) That Are Currently Landfilled In The Fifty States”

- 6.5% of used plastics are recycled
- 7.7% are combusted via energy recovery
- 85.8% are landfilled!
 - But ?? % is found in marine habitat



...debris by land and by sea....

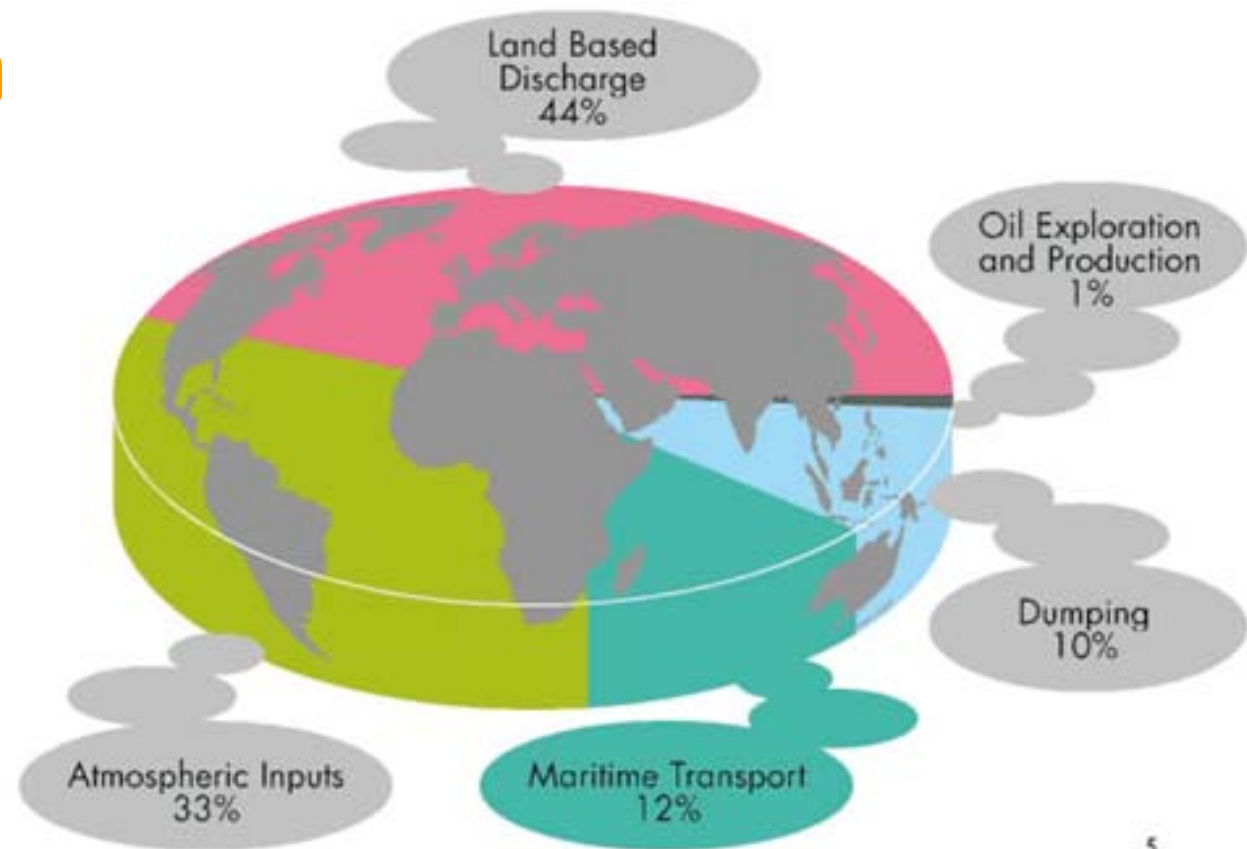
- **Ocean based**

**Fishing vessels; stationary platforms;
cargo ships and other vessels**

- **Land-based**

**Littering; dumping; poor SWM practices;
storm water discharges; extreme
weather events**

Marine Pollution



Source: Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP)



Marine Debris

Marine debris is any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes.



Source: NOAA Marine Debris Program at www.noaa.org



Micro plastics



Source: www.noaa.org



Active Recovery Programs

Global, National and Local

- **Clinton Global Initiative**
 - Project Kaisei
 - Don't Trash the Ocean
- **Fishing for Energy**
- **Litter to Light**



Clinton Global Initiative

- **Plastic Recovery Partnership to Clean Up Our Ocean, 2010**
- **Ocean Conservancy's Trash Free Seas Alliance, 2011**



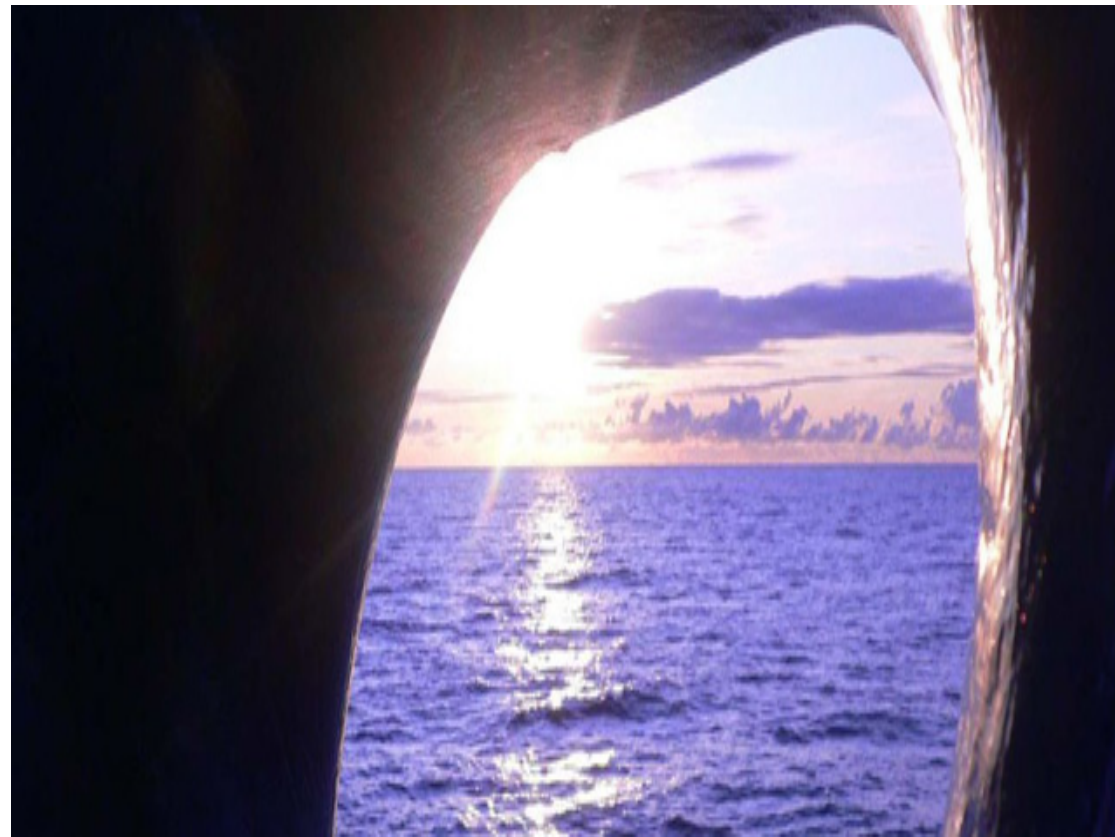
2010 CGI Project Partners

Plastic Recovery Collaborative Partnership

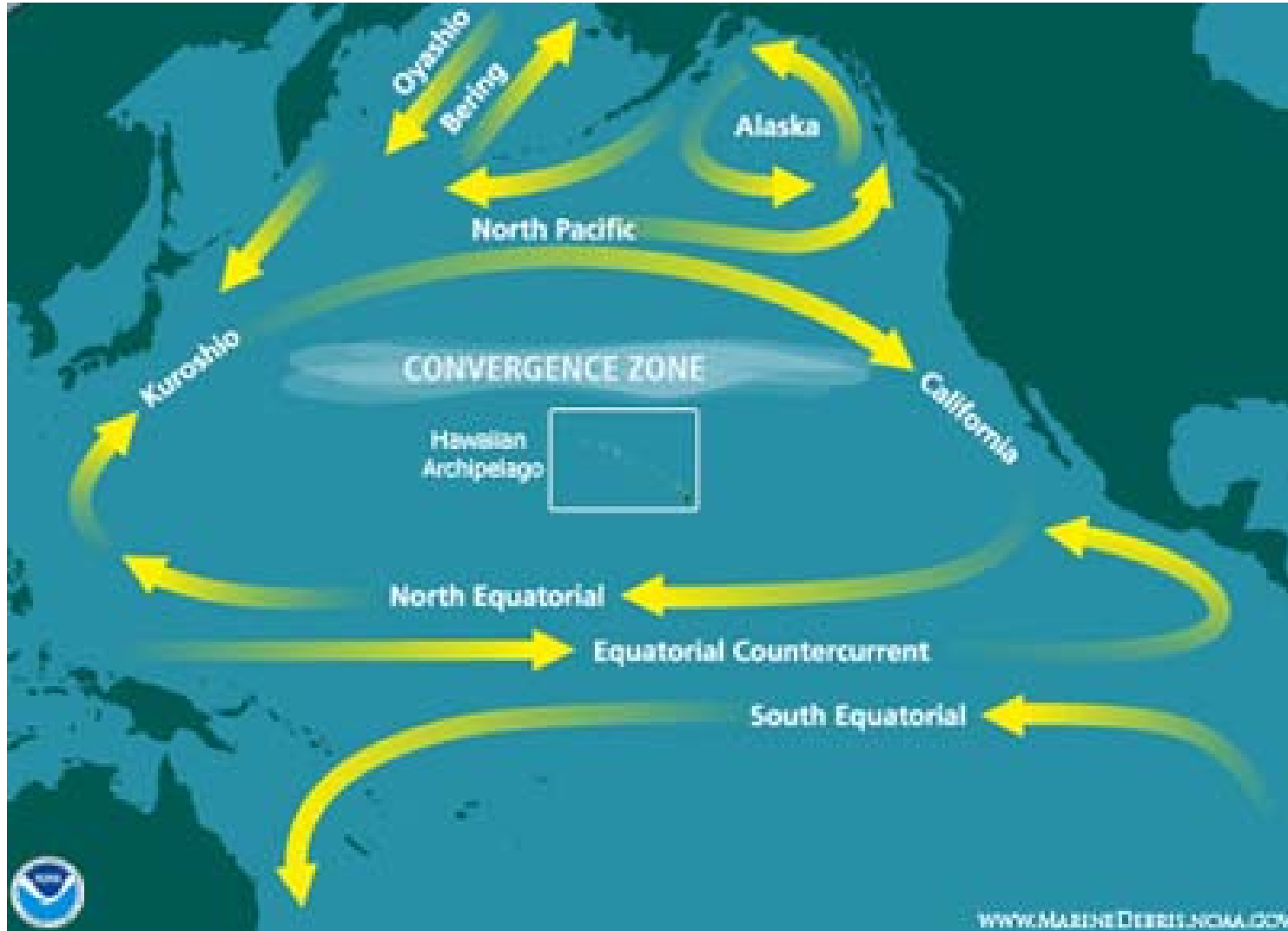
- Project Kaisei
- Covanta Energy Corporation
- Yale University, School of Forestry and Environmental Sciences



Project Kaisei



Time is running out... ..
it is time for us
to revisit the ocean...







2011 CGI Trash Free Seas Alliance Founding Members

- Ocean Conservancy
- Covanta Energy
- Surfrider Foundation
- Ocean Recovery Alliance
- Illinois Tool Works
- Marine Mammal Center
- Coca-Cola Company



Generating New Energy from Old Gear



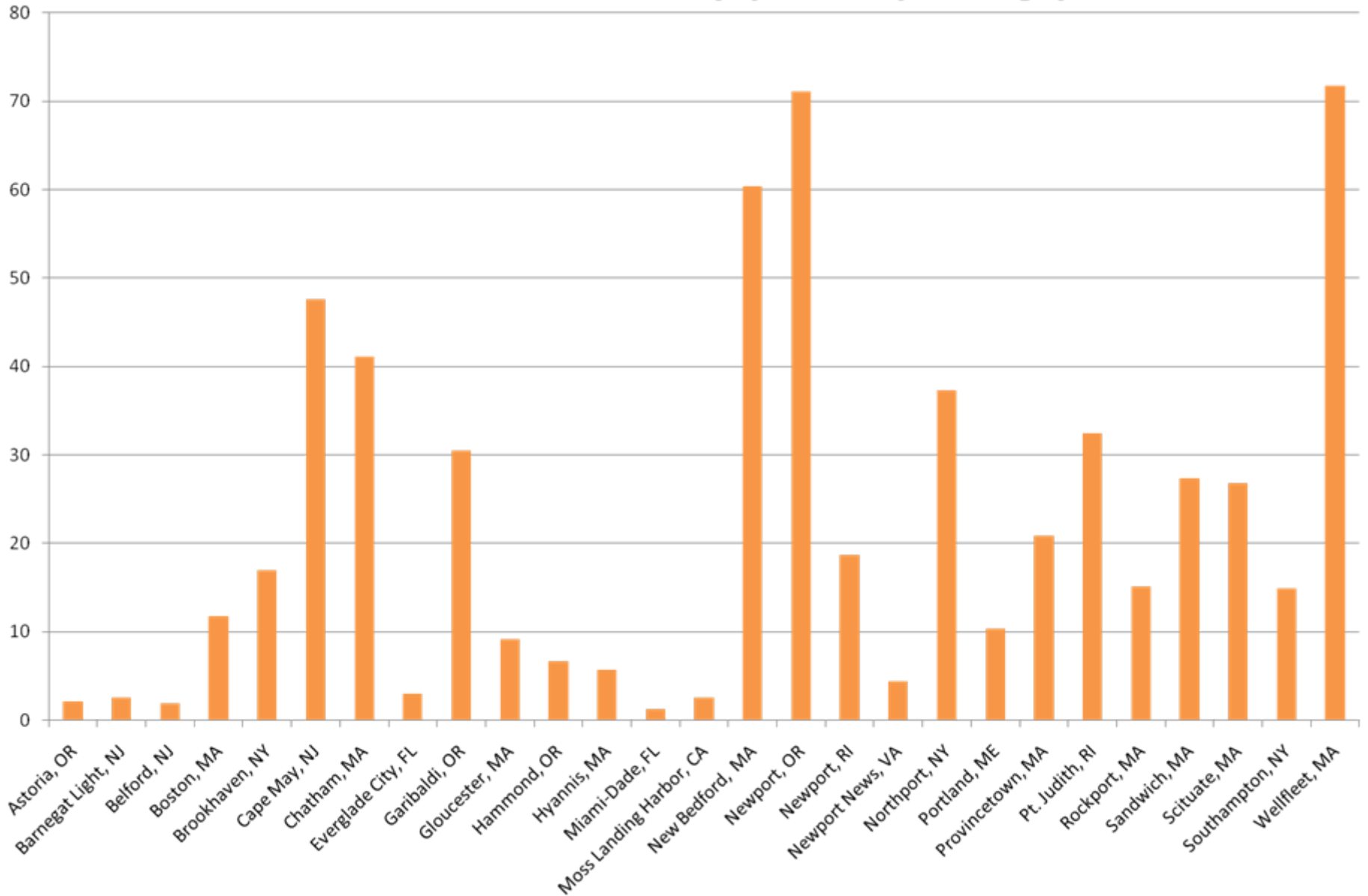


Program Quick Facts

- Fishing for Energy began in 2008
- Partnership of 2 Private Industry Organizations, 1 Non-Profit, 1 Federal Agency
- 28 ports in 9 states
- ~600 tons of gear collected

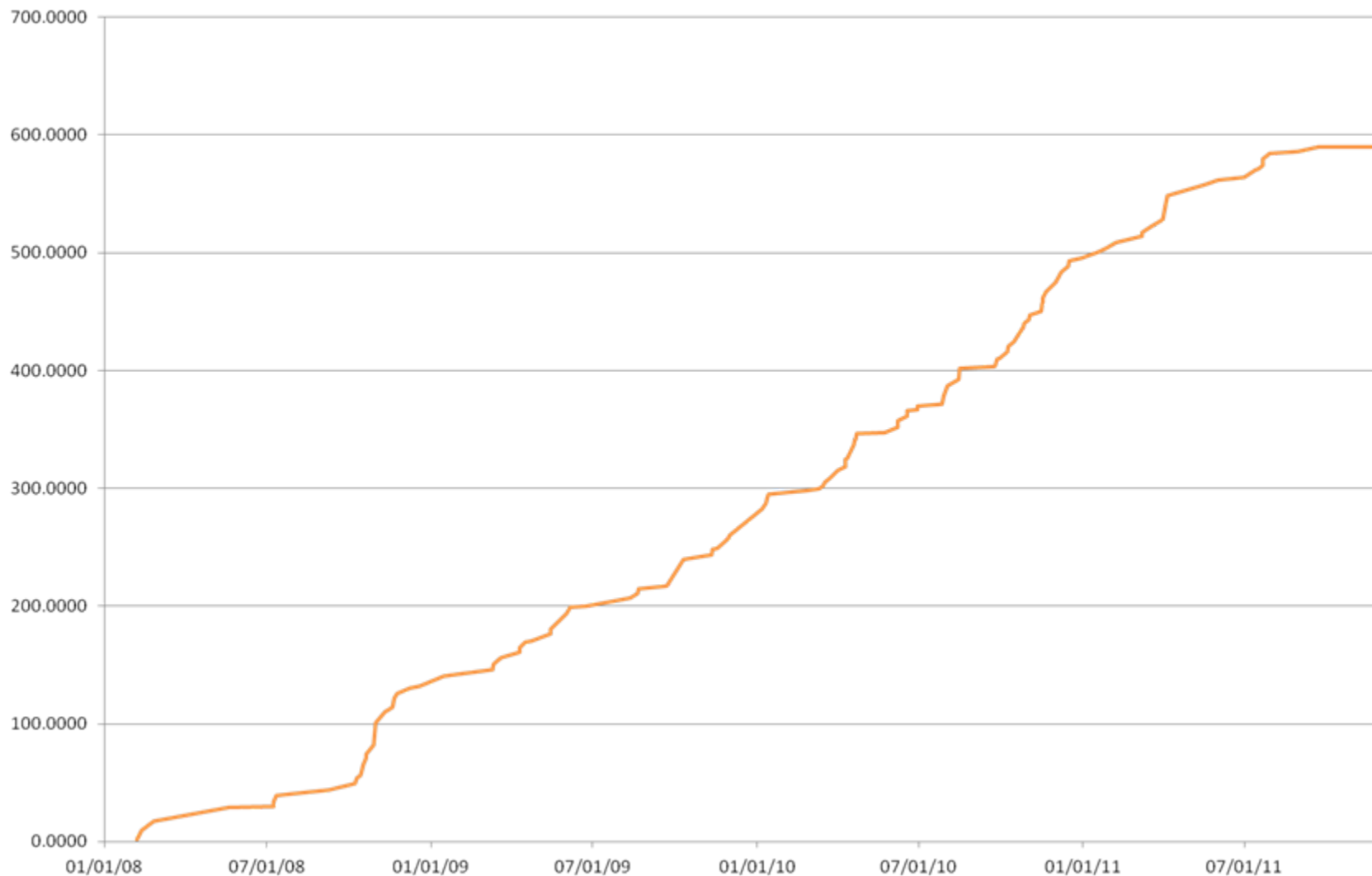


Tons collected to date by participating ports





Tons Collected since February 2008



Participating Ports





Discarded gear at a Fisherman's Cooperative





At Sea Derelict Fishing Gear Retrieval





Gear Delivery





Fishing for Energy bins





Re-using Materials



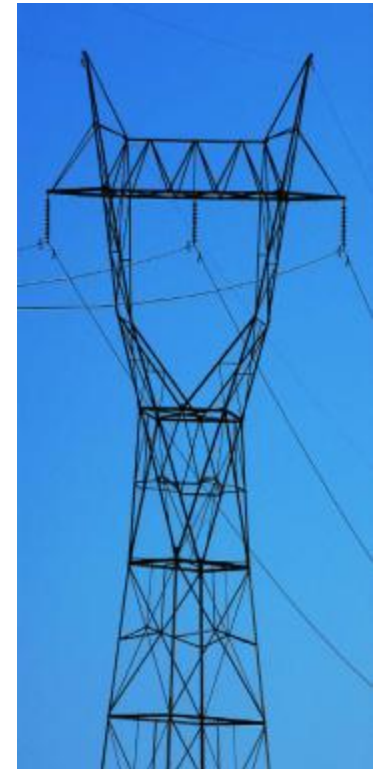
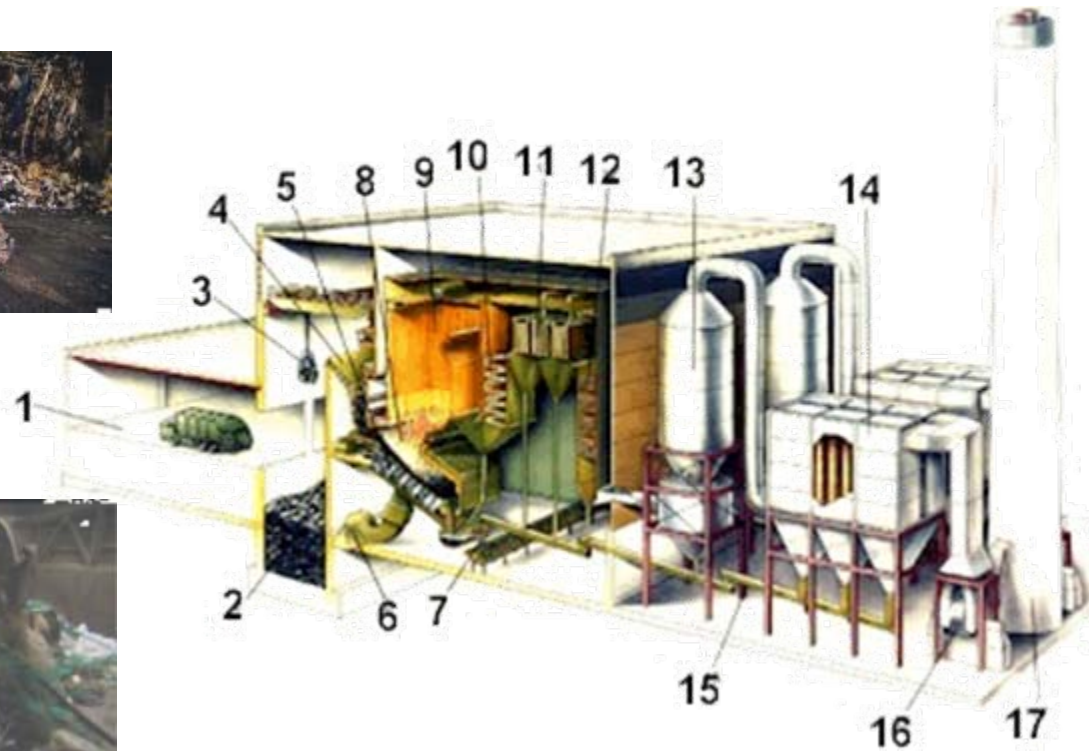
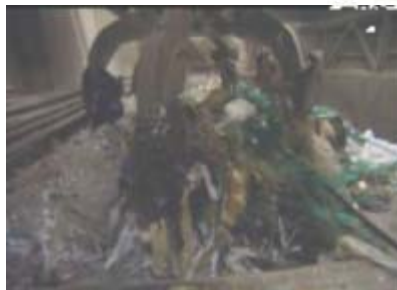


Recovering Energy





Recovering Energy





Litter to Light

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for a cleaner world



Litter to Light Partners

- **Watershed Councils**
- **Youth/At Risk Groups**
- **Scouts**
- **Citizens**
- **Municipal Governments**



Litter to Light

- Offered to contract communities
- Clean up equipment, including collection bags, gloves, vests
- Free disposal for litter
- Basic calculation of energy value
- Usually in conjunction with World Ocean Day or Save the Bay or Source to Sea events



What's Next?

Marine Debris Tracker App

- iphones
- Androids



Source: http://www.noaa.gov/features/02_monitoring/marinedebris.html



Categories





Blight?
Feedstock?
Both?

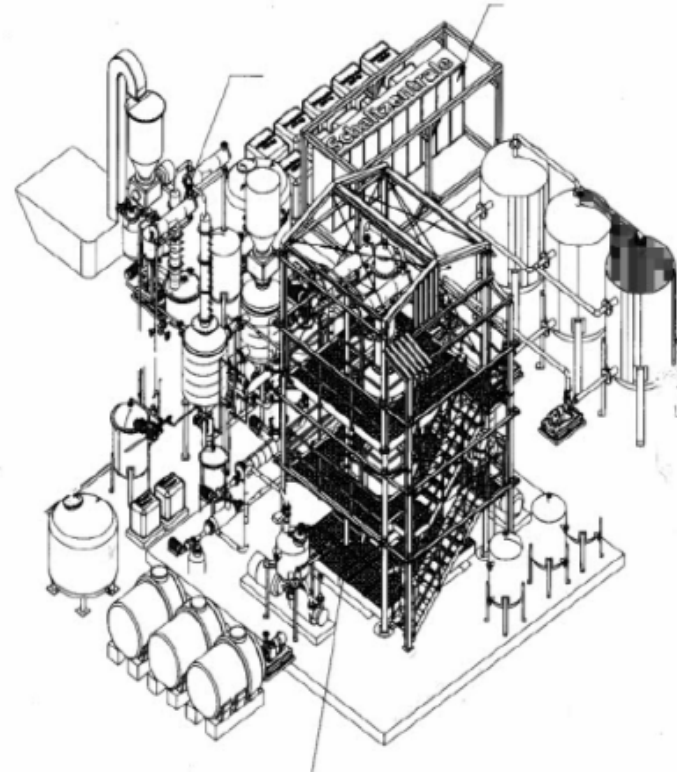


Plastic Waste to Diesel Potential?

- **Why even consider and where?**
- **Important factors:**
 - **Cost/use/need of diesel**
 - Subsidies keeping diesel cost down?
 - **Feedstock availability**
 - Single stream best but maybe it's a use for the residual and/or contaminated plastics
 - Reliable collection system
 - **Costs – Life Cycle Analysis**
 - **Political Will/Political Stability**

Demonstration Unit

- RDF capacity ~ 45 TPD
- Diesel product ~ 180 gal/hr
- RDF specification < 1/2" and metals removed
- Utilities: electric (~750 kW)
cooling water, instrument air
- Building size ~ 50' x 100'
- Enclosed system







Demonstration Project Objectives

- **Demonstrate conversion of solid organic materials to diesel**
 - **RDF, mixed plastics, biomass, compost**
- **Define and optimize process**
- **Understand RDF processing requirements**
- **Understand equipment - reliability**
- **Determine O&M costs**
- **Test product diesel characteristics**
- **Test diesel in non-highway vehicular uses**
- **Evaluate limited testing in highway vehicles working with EPA**



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Plastic Waste/Debris to Diesel Fuel?





It's Not Waste

(or litter or marine debris)

If it's Energy



Thank you!

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