

CONVERSION TECHNOLOGIES

The Future of Waste - to - Energy



AGENDA

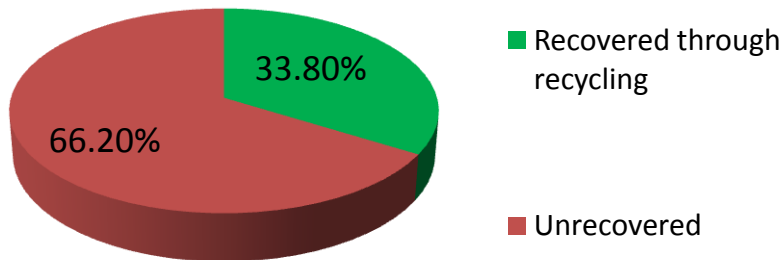
- Global Facts
- Conversion Technologies
- Pyrolysis/Gasification
- How do they work?
- Process Description
- Benefits
- Accepted Materials

Statistics

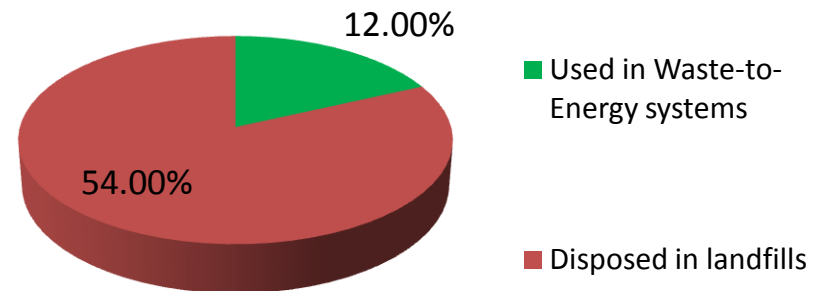
- Facts

- 2009: Americans generated **243** million tons of Municipal Solid Waste (MSW)

Municipal Solid Waste in the US (2009)



Unrecovered Municipal Solid Waste in the US (2009)



Source: US Environmental Protection Agency

GLOBAL STATISTICS

- Facts

- United Nations Environmental Program reported:

- 2.02 Billion** Tons of Garbage generated worldwide in 2007

- 2.78 Billion** Tons of Garbage expected to be generated in 2011

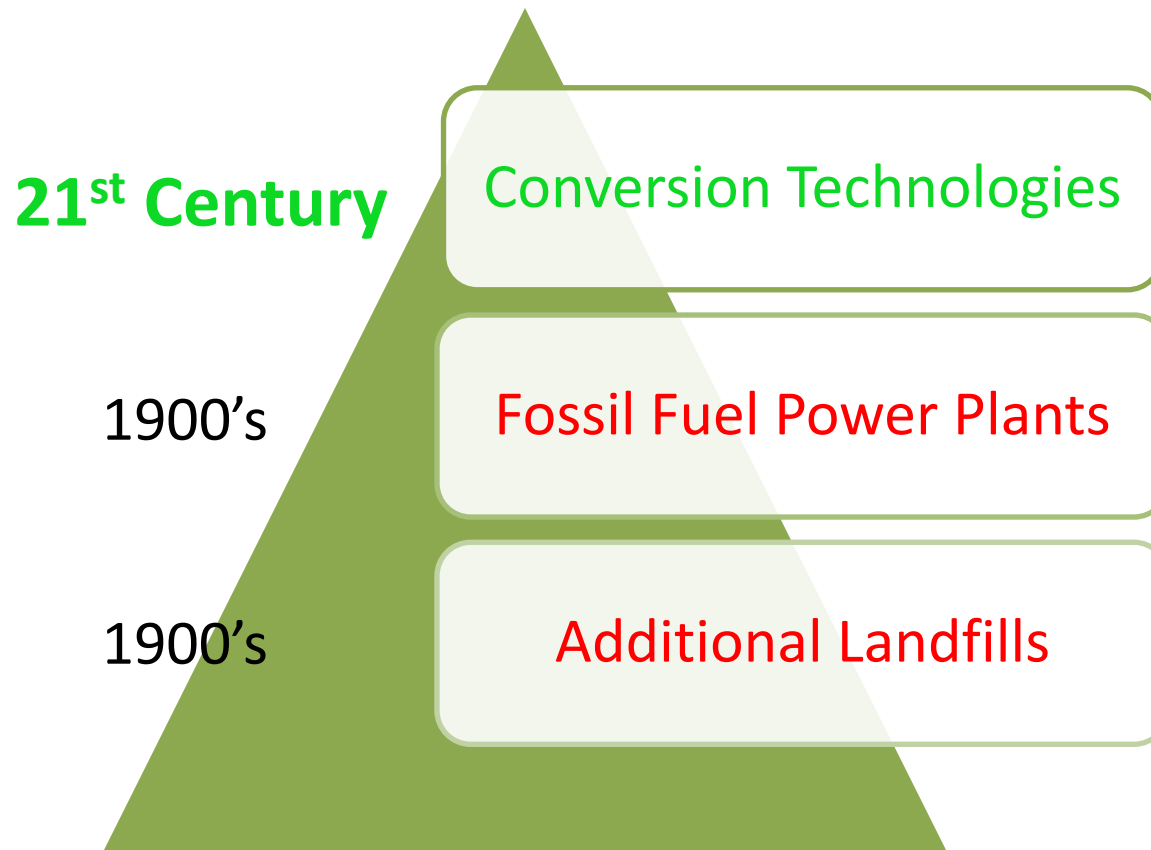
- **44.6%** of all electricity used in the US is derived from coal combustion

- Coal-fired power plants account for **32%** of the total US Carbon Dioxide discharge

- Electricity demand in the US is projected to grow by **2%** in 2012

PAST & PRESENT

- Solutions?



CONVERSION TECHNOLOGIES

- Why are Conversion Technologies (CT) considered advanced?
 - Overall Efficiency:

CT effectively produce energy and reduce volume while disposing of MSW in a closed loop self sufficient system.
 - Sustainability & Environmental Superiority:

“By conservative estimates, conversion technologies have the potential to reduce annual greenhouse gas emissions by approximately five million tons of Carbon Dioxide equivalent in California alone”
(California Air Resource Board’s Economic & Technology Advancement Advisory Committee (ETAAC)).
 - Financial Feasibility:

CT create a minimum of four revenue streams:

 1. Tipping Fees
 2. Recyclables Sales
 3. Energy Sales
 4. Carbon Ash Sales



CONVERSION TECHNOLOGIES

- U.S. Department of Energy World Gasification Database 2010
 - Currently, there are 144 operating plants around the world with a total of 412 gasifiers
 - 9 of these 144 plants use municipal solid waste as a feedstock and are successfully operating in Asia, Australia and Europe
 - Gasification conversion technologies are located in 29 different countries around the globe. Asia and Australia lead the market with 37 % of the global operating capacity.
 - The U.S. Department of Energy, DOE forecasts “with 63% of total planned capacity growth, North America has the potential to lead the world’s regional growth through 2016.”
 - Alliance Global Conservation will build the *first* thermal conversion gasification plant in North America using MSW for electricity generation.



PYROLYSIS

- Definition:

“Pyrolysis is the thermal decomposition of organic & synthetic waste material at elevated temperatures in the absence of oxygen.”

The gases that are extracted during this decomposition are called Product Gas, which contains mainly Hydrogen, Carbon Monoxide & Hydrocarbons such as Methane, Ethane & Propane.

PYROLYSIS

- Pyrolysis/Gasification:

Pyrolysis Gasification

- Gasification of waste by heating in the absence of oxygen
- Produces product gas
- Combustion Engine
- CHP System/Steam

· 90%-95% Reduction in volume.

· 5%-10% Parasitic Load

· 800°-1200° Operating temperature

· Existing technology that is developed & widely used

Pyrolysis Gasification

Pros:

- Complete destruction of pollutants
- High rate of volume reduction
- Low operating temperature
- Developed existing technology
- Low cost per MW
- \$4.5-\$5 Million/MW including handling equipment
- Majority of the byproduct can be sold at a premium
- Product gas emissions are low in CO2 meets USA's highest standards
- Modulated for expansion
- Continuous feed

Cons:

- Emissions are present due to use of combustion engine gensets, but are below standards

PYROLYSIS/GASIFICATION



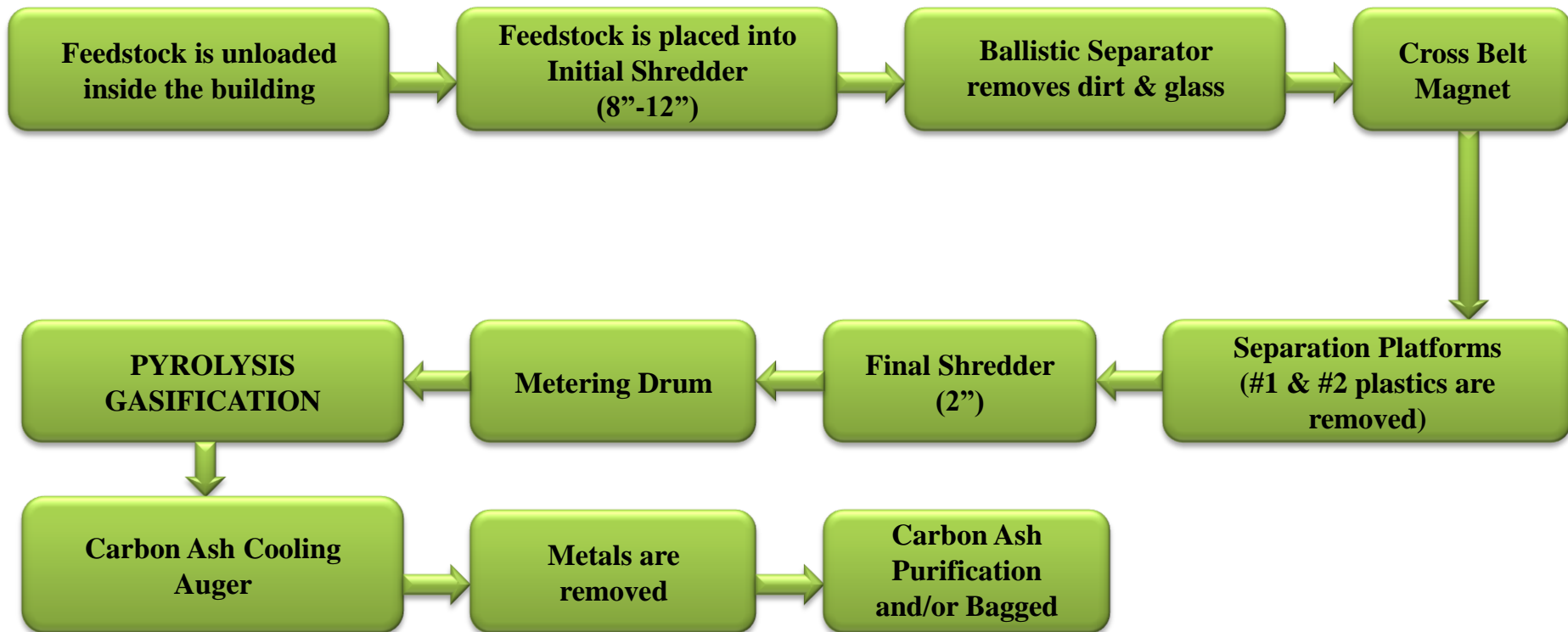
PYROLYSIS/GASIFICATION

- Energy is placed back to the grid



CONVERSION TECHNOLOGIES

- MSW Process



BENEFITS

- **Pyrolysis is:**
 - Safe, Simple & Efficient waste treatment process that substantially reduces the weighted volume of waste by more than 90% and remaining can be used in other applications.
- **Complete Destruction of Waste Pollutants Including PCB's**
- **Very Low Emissions that exceed the Highest US Air Standards**
- **Reduces use of Fossil Fuels**
- **Decreases Methane Emissions**
- **Extends Life of Local Landfills**
- **Reduces Risk of Groundwater Contamination from Landfills**
- **Enhances Existing Recycling Programs**
- **Reduces Tipping Fees**
- **Environmentally Responsible**



CONVERSION TECHNOLOGIES

● Accepted Materials

● Municipal Solid Waste

- Common household and commercial trash diverted from landfill sites at contracted tipping fees.

● Automobile fluff.

- Remains of a shredded car with metals removed

● Coated papers are non-recyclable

- i.e. sticker back paper

● Wax lined or contaminated cardboard

● Multi-layer plastics (ie food packaging)

- Contamination with food residue is OK

● Plastic lined paper ingredient bags or seed bags with moisture barrier.

● Out of date crop seed in the bag.

● Tires

- Requires additional front end processing equipment

● Shingles

- Requires additional front end processing equipment

● Scrap filter papers

● Animal and or Human Waste

- Lagoon waste from large livestock operations

- Human waste from sewage treatment facilities

- Material must be dried to 30% moisture or less

● Wood waste



CONVERSION TECHNOLOGIES

- Contact

Ryan Harrill

Project Management/Sales

1030 Orlando Drive

De Pere, WI 54115

Phone: (920) 336-3400

Fax: (920) 336-3401

Cell: (920) 619-4454

E-mail:

ryan@allianceglobalconservation.com

Website:

www.allianceglobalconservation.com

