“Redefining Waste”
Infinitus Energy
and the IREP Team of Professionals
extend a warm welcome to the attendees of the
NERC’s Spring 2015 Conference
“Dirty MRF” = Mixed Waste Processing

- Mixed waste processing (MWP) is a modern, integrated waste processing and recovery system
- Un-segregated mixed waste is processed using mechanical technologies to separate mixed recyclable materials from other waste
Dirty MRFs processed primarily commercial dry waste
  - i.e. Just chasing fiber (OCC and paper)
- Floor sorting at transfer stations: areas with high tip fees or lucrative paper markets – Or Both!
- Worked best when input came from homogenous sources like office complexes or retail

Photo credit: Bobcat
Early Dirty MRFs:

- Low, inconsistent recovery rates
- Contamination issues
- Presented health and safety concerns
- Essentially manual and semi-automated floor sorting of garbage
Why Mixed Waste Processing?

- State and local legislation driving higher diversion rates – 60% > 75% > 80% > Zero?
- Access to more materials – “Close The Loop”
- Improvement in sorting technologies
- Shifting operating costs
  - From the Curb to Controlled Environment?
- Convenience?
  - “Or are we just lazy?”

Examples of successful MWP facilities now exist
Why Mixed Waste Processing?

- Communities are responsible for 100% of the waste stream, not just the valuable materials.
- Voluntary source-separation collection programs can have low participation rates and depend on heavy education & outreach efforts.
- Mandatory recycling programs may not be politically feasible.
Why Mixed Waste Processing?

- Single stream programs have increased voluntary recycling rates significantly; commercial lagging
- But, give folks a single cart/container and you are guaranteed a 100% participation rate
Advances in Technology

“Technological advances in the processing equipment have just begun...Hand-picking materials is the equivalent of digging ditches without bulldozers.”

October 1998 Recycling Today article
MSW Market Opportunity

Only 34.5% of MSW Generated is recycled

A majority of the reusable resources in U.S. MSW remain untapped

*Management of MSW in the United States, 2012 (per USEPA)
The IREP Model

- **CNG-Fueled Trash Collection Fleet**
- **Anaerobic Digestion Facility**
- **Advanced Mixed Materials Resource Facility ("AMMRF")**
- **Electricity**
- **Compost**
- **Compressed Natural Gas (CNG)**
- **Engineered Fuel**
- **Recovered Materials**
- **Recovered Materials to Local and/or International Markets**

**Workflow:**
- Waste flows to the AMMRF.
- Organic waste goes to the Anaerobic Digestion Facility.
- Commodities include recovered materials.
- Development, management, and funding are provided.
- Engineered fuel is produced.
- Natural gas (CNG) is recovered.
- Materials are sold to local or international markets.
ADVANCED MIXED MATERIALS RESOURCE FACILITY ("AMMRF")

Completed Phase I

GRAND OPENING – APRIL 14, 2014

CNG-FUELED TRASH COLLECTION FLEET

ANAEROBIC DIGESTION

RECOVERED MATERIALS TO LOCAL AND/OR INTERNATIONAL MARKETS

ELECTRICITY

COMPOST

COMPRESSED NATURAL GAS (CNG)
IREP MONTGOMERY MRF, L.C.C.
± 81,992 S.F.

86 PARKING SPACES
HIGH AUTOMATION
Acceptance Test

- Conducted by CDG Environmental Engineers selected by the City of Montgomery
- Performed May 5-9, 2014
- Confirmed processing rate of 32.36 tons per hour
- Confirmed overall waste diversion above 60%
- Confirmed recovery rates of:
  - Plastics: 96%
  - Mixed Paper: 95%
  - OCC: 97%
  - Tin/Steel: 94%
  - Aluminum Cans: 90%
Montgomery, Alabama

Before MRF
✓ Failed orange bag recycling program due to lack of participation
✓ 100% to landfill

After MRF
✓ 100% participation
✓ 60% overall waste stream recovery, City-wide
RECYCLABLES – Recovered Fiber
(Actual IREP@Montgomery Photos)
“We find no statistical difference in the IREP material as compared to single stream material.”

-KM Plastics, Buyer
RECYCLABLES – Recovered Metals/Other
(Actual IREP@Montgomery Photos)
Participation Rate vs. Efficiency

National Recovery Rate: 10-34.5%*
(Montgomery 2012 – 1%)

IREP Landfill Diversion Rates
- Raw Material Fraction: 30-40% (current phase)
  (Traditional Recyclable Material)
- Organic Fraction: 20-30% (future phase)
  (Utilized in AD and Compost)
- Engineered Fuels 10-15% (future phase)
  (Fiber and Polymer Residue)

Total IREP Landfill Diversion: 60-85%

AVERAGE: 75%

*Management of MSW in the United States, 2012 (per USEPA)
AMMRF System Advantages

- Bale quality from our AMMRF technology allows us to compete in high quality markets including China.

- New technology for Montgomery sends PET with liquids in the bottle to the PET bin.

- Fiber (mixed paper/OCC) quality very important during lower demand months such as summer, including no glass in bales.

- Aluminum recovery rates are currently 95+%. 
IREP@Montgomery Benefits
(at full implementation of model)

Environmental and Operational Impacts
• Up to 85% reduction in material to landfill (at system optimization)
• 95% of organic fraction from MSW diverted to AD system to produce CNG
• City will operate one of the Country’s first carbon negative collection fleets

Financial Impacts
• Up to $1.6 M annual savings in landfill operations
• Projected $2.2 M net annual reduction in collection fleet operating costs

No capital investment required by the City
• No capital investment from the City- 100% Private Investment
• No risk to the City- no funds expended until project systems are delivered
  • Municipal obligation for tipping fee payment upon delivery of the facility
  • Recovery rates and system performance guarantees in Contract
CHALLENGES

Operating Challenges

- Lack of cardboard in the waste stream (scavenging)
- Mixed waste processing requires aggressive training and labor transitions
- No labor pool for mixed waste processing even at the managerial level
- Changing the mindset of personnel trained in similar environments with other waste companies to understand we are a manufacturing company and process
- City and Private Organization must become a partnership and not adversarial

Industry Challenges

- Opposition from both the paper and metals industry
- Misinformation in the marketplace
- Backlash from the recycling industry and political organizations to maintain source separation (“We are teaching our kids to NOT recycle”)
THANK YOU