Efficiencies in Biosolids Transportation and Processing to reduce Carbon Impact

Three Short Case Studies

1. **Active Biosolids Management at the Portland Water District**

2. **Energy Efficiency at the Hawk Ridge Compost Facility**

3. **Emerging Alternative Fuels**

Portland Water District
FROM SEBAGO LAKE TO CASCO BAY

Active Biosolids Management

- **Significant operating expense for many POTWs**

- **Opportunities and supports for active management**
  - Dewatering technology
  - Operational considerations
  - Maximizing load size

- **Benefits of active management**
  - Fewer tons to move
  - Fewer loads
  - Less fuel use and lower carbon footprint
  - Financial savings

Dewatering Technology

Operational Considerations

- **Equipment options**
  - Roll-off containers
  - Trailers
- **Space considerations**
  - Load out area
  - Accessibility
- **Generation rate**
  - Time to fill
  - Storage capacity
- **Loading options**
  - Automated
  - Avoid double handling
  - Consider odor implications

Maximizing Load Size

- **Can't manage what you don't measure**

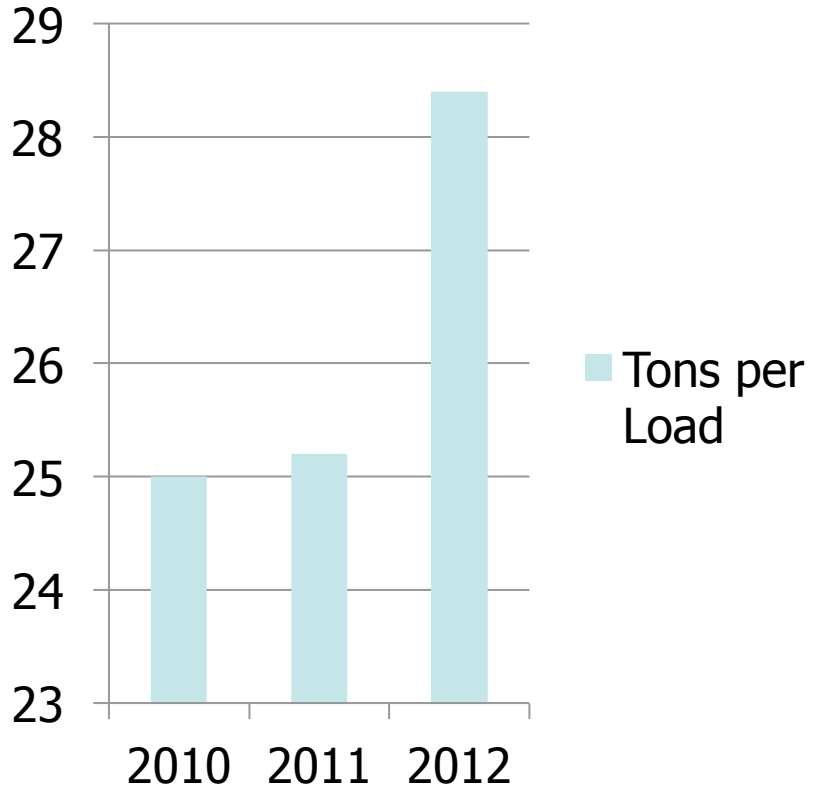
- **Tech & Tricks**
  - Ultrasonic sensors
  - Webcams
  - "Top Hats"

Custom Fabricated “Top Hat”

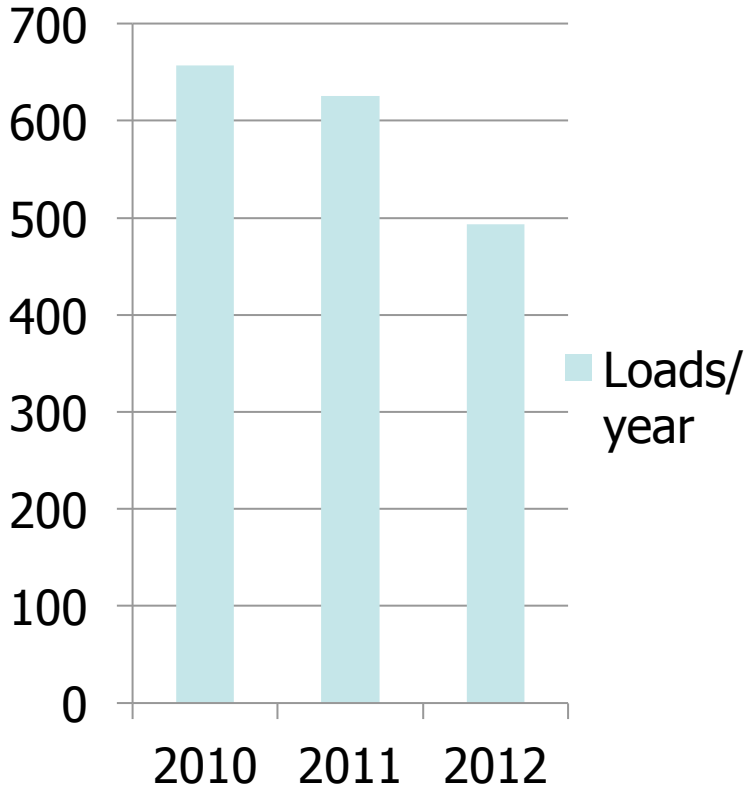
Full truck – Loaded for Departure

Directly Inverse Relationship between tons per load and loads*

Tons per Load

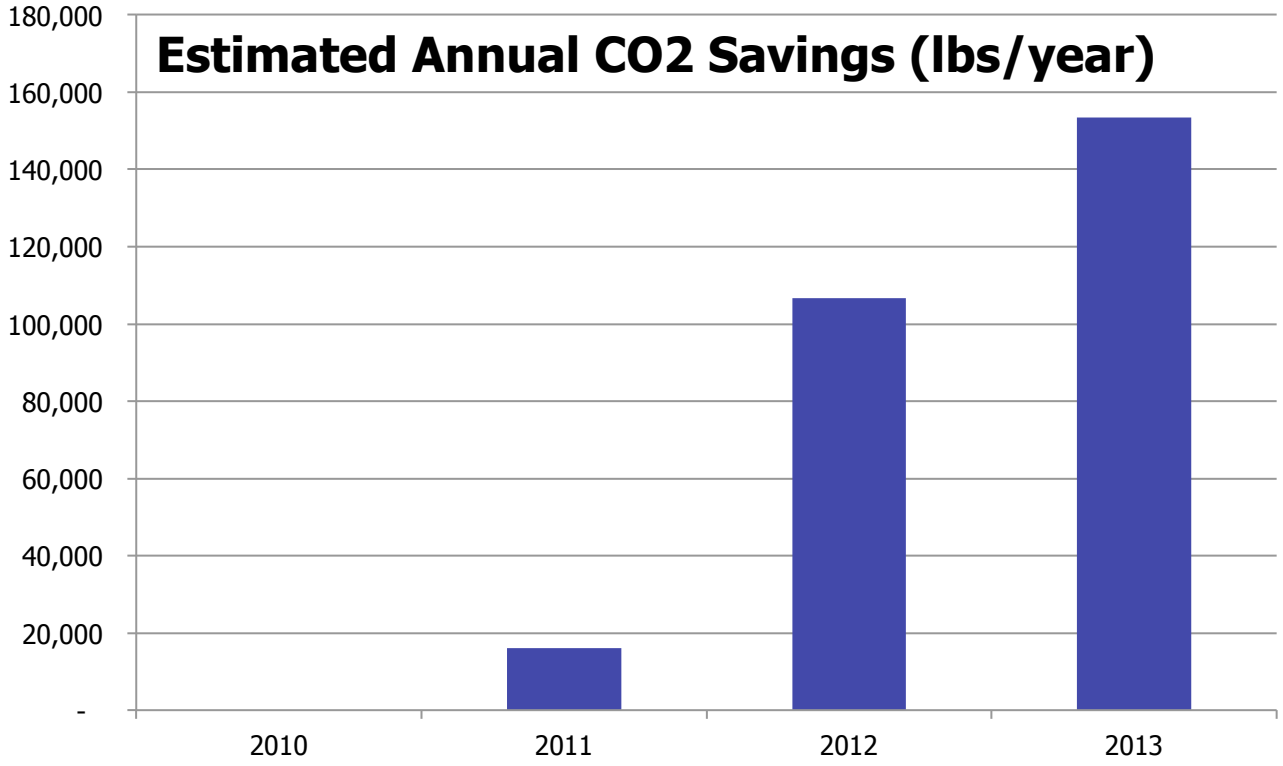


Loads per Year



*Excepting impacts of flow variability. Portland East End plant, only

Carbon Dioxide Savings from Reduced Truck Trips



Portland East End plant, only

Carbon Reduction Impact

Increased load size

led to **decreased number of trips/year**

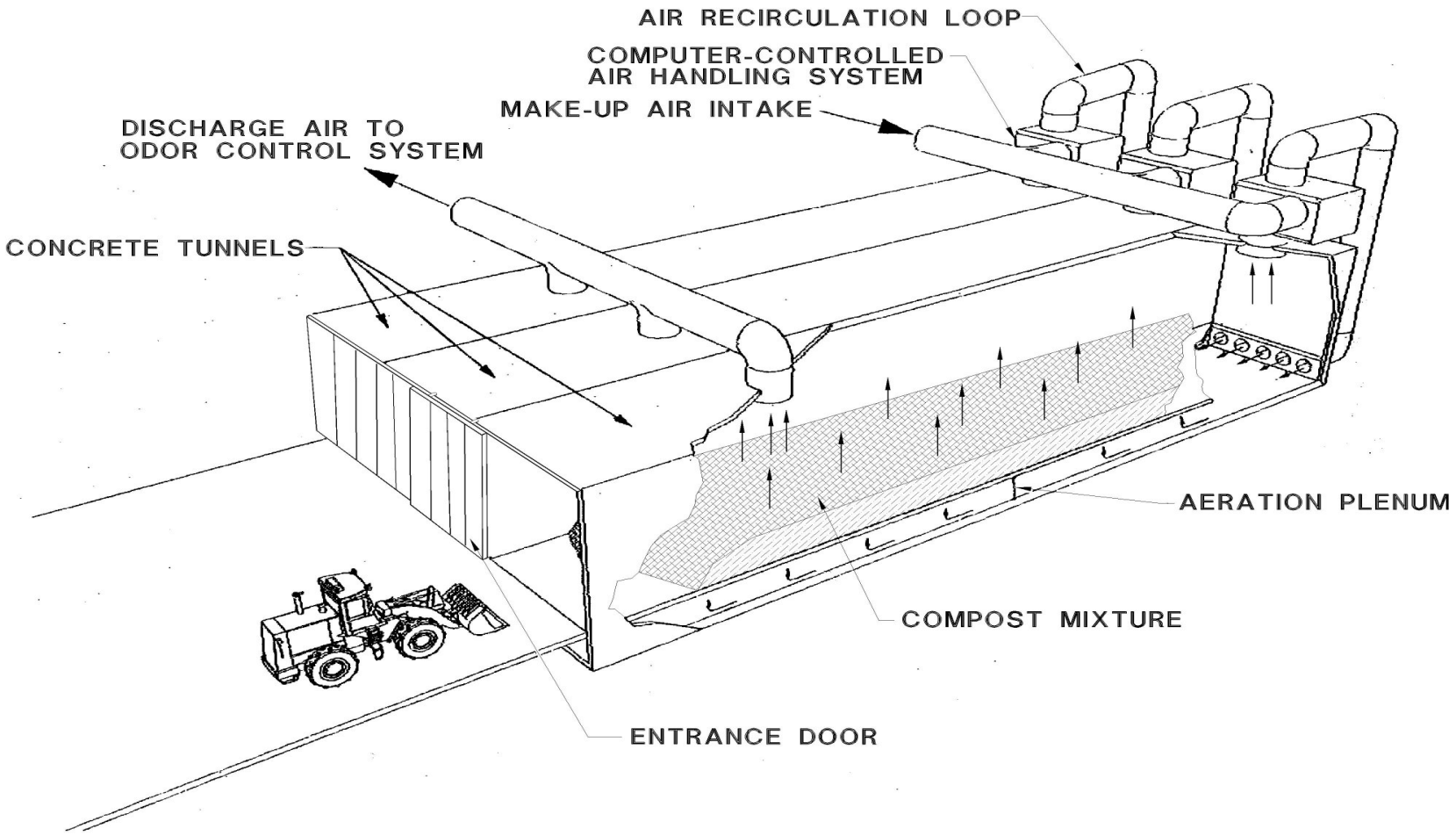
which **reduced Carbon Dioxide Emissions**

from **6,500 gallons of diesel fuel** saved each year

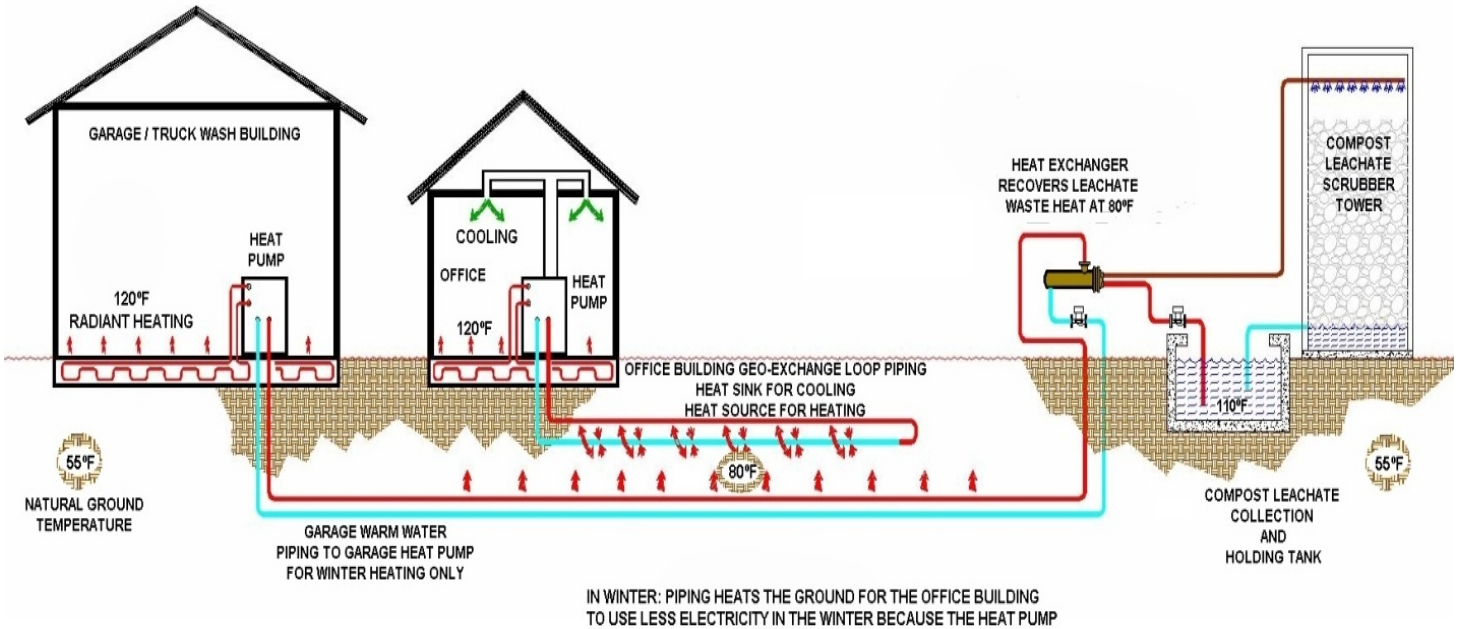
equivalent to **taking 34,000 cars off the road**

or to the carbon sequestered by **135,000 acres of US forest**

Hawk Ridge Compost Facility: Tunnel Technology



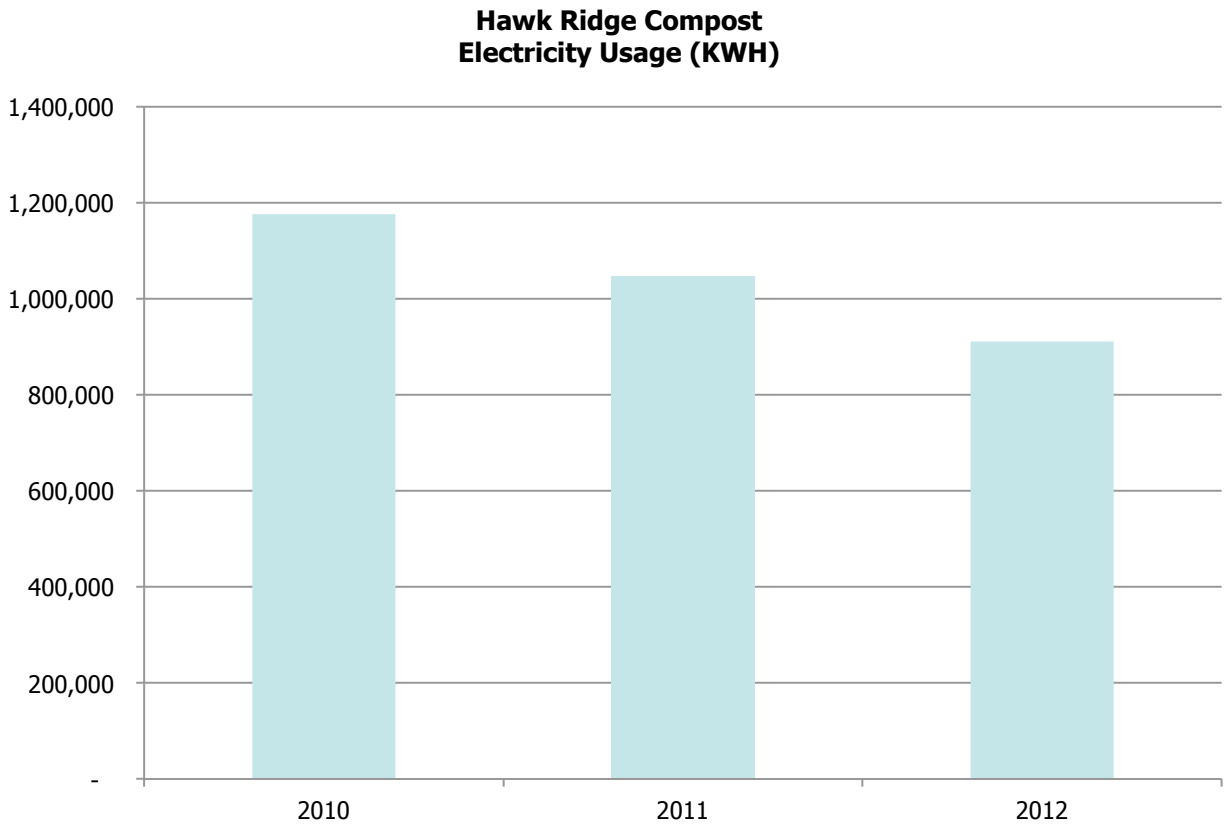
Bio/Geothermal System at Hawk Ridge Compost Facility



IN WINTER: PIPING HEATS THE GROUND FOR THE OFFICE BUILDING TO USE LESS ELECTRICITY IN THE WINTER BECAUSE THE HEAT PUMP DOES NOT HAVE TO WORK AS HARD IN THE WINTER TO GET HEAT INTO THE BUILDING

IN SUMMER: THE GARAGE PIPING IS OFF AND THE HEAT PUMP COOLS THE OFFICE BUILDING WITH THE COOL 55°F GROUND AS AN ENERGY EFFICIENT HEAT SINK

Operational Efficiencies Reduce Electricity Consumption



Looking Ahead: Emerging alternative fuels

Casella has invested in 4 CNG fueling stations:

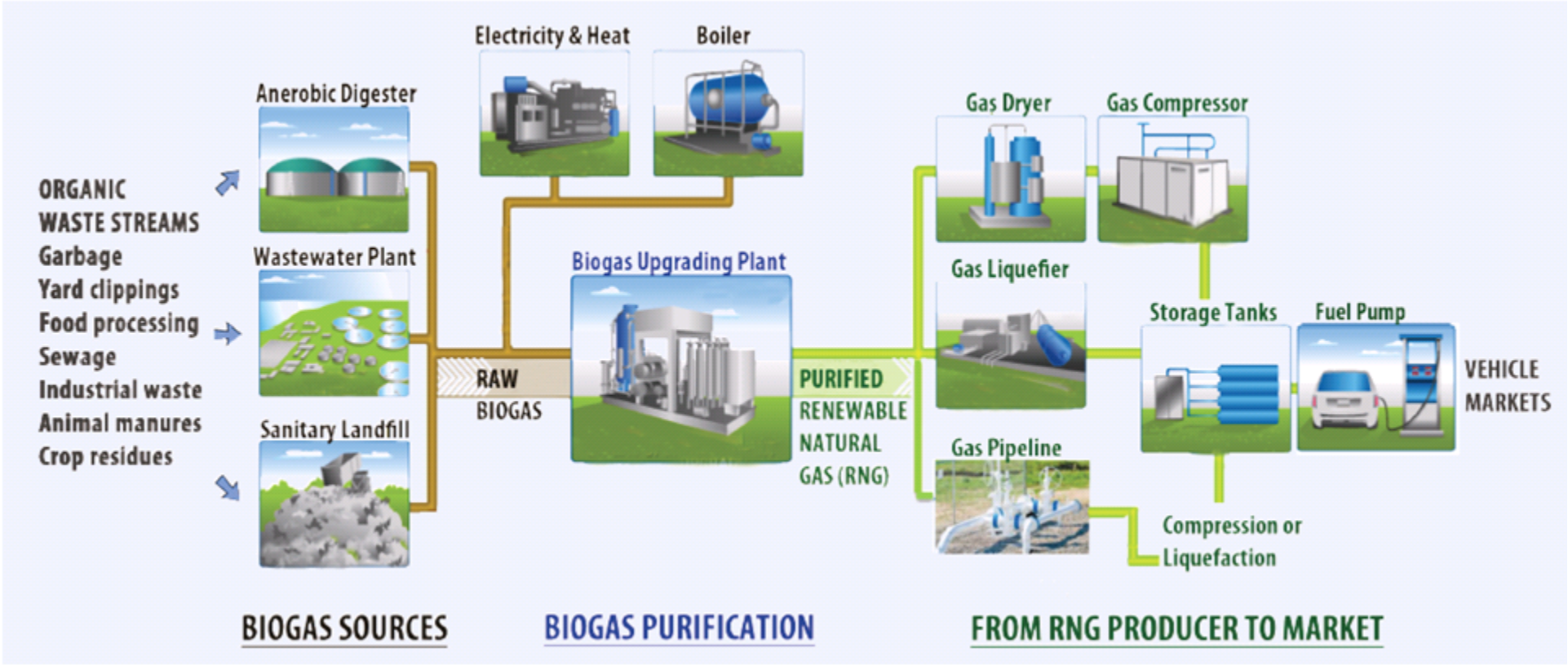
- Burlington, VT
- Ft. Edward, NY
- Geneva, NY
- Horseheads, NY

Compared to diesel, CNG reduces greenhouse gas emissions by **77,000 lbs of CO2e per year per truck.**

CNG Refuse Collection Truck

Time Fill Post Dispensers

Producing Renewable Vehicle Fuel from Biogas



Graphic Source: Argonne National Laboratories, 2010 Waste to Wheels Report. Pg 7. Adapted by Erik Neandross, Gail Richardson, and Mariane Mintz from K. Sorcheck, Xebec, Inc. – Biocycle USA, October 2010. From Neandross *Promise and Challenge of RNG as a Vehicle Fuel*. energy-vision.org

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