HELPING L.I. COMMUNITIES "GREEN" BUS & TRUCK FLEETS

A LEADERSHIP ROLE FOR BUSINESSES

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President - Energy Vision

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Stony Brook University Workshop
Holiday Inn, Centereach, NY
FOCUS: Founded (2007) to promote sustainable transportation using research, public ed, and collaboration with public and private leaders to advance alt fuels projects.

TEAM: 15 years studying alt fuels: 11 reports compared fuels & published 1st analysis of options for transit buses *(Bus Futures 2000)* and refuse trucks *(Greening Garbage Trucks, 2003 & 2006)*.

IMPACTS: Inspired 1st CNG refuse fleet in NY (Smithtown) and in NJ (Hamilton). Smithtown lead to Brookhaven, Huntington & Oyster Bay!!!! Initiated national discussion of renewable natural gas!
WHAT BUSINESSES NEED TO KNOW TO HELP COMMUNITIES “GREEN” THEIR FLEETS

1. **Drivers** that communities & industries need to consider (or are considering) for ending reliance of their fleets on petroleum-based fuels and building new green economies and jobs

2. **Solutions** and how your skills can turn them into business opportunities

3. **Public policies** that can accelerate the pace of change and that provide $$$
DRIVER FOR CHANGE - OIL
A Fuel the U.S. Can’t Count On

- **1947**: U.S. self sufficient - a net oil exporter to our WWII allies.

- **Today**: Hooked on imports - 1973 (35%); 1992 (40%); 2008 (65%)

- **US**: 5% of world’s people using 25% of oil consumed worldwide – wrong image for our country
OIL: THE U.S. CRUNCH!
Using More & Producing Less
(1949-2008)
OIL: RISKS TO US SUPPLY

46% of Net Imports of Crude Oil & Petroleum Products From Unreliable OPEC Sources
OIL: THE WORLD CRUNCH!

3 Countries (1/3 of all people), with Rising Consumption, vie for Imports

Source: EIA
OIL: THE WORLD CRUNCH

More People.....

156,000 more a day!
Drain on Our Economy

- $$$$$ More that $300 billion a year sent abroad to buy our oil- $820 million a day ($120 million for fleets)

- LIVES: Billions more spent defending sources of our oil

- JOBS: More than a million energy jobs lost since the 1970s. We need green energy jobs in the US.
OIL #3
Too Much Pollution

- Emissions of Soot and Nitrogen Oxides damage lungs and aggravate cardiovascular disease

- Emissions of toxic substances - significant cancer risk

- 175 million Americans live where air violates public health standards.
OIL - # 4
Too Much Carbon
GHG Emissions & Concentrations 1751-2004
PRACTICAL SOLUTIONS: WHERE TO BEGIN?
10 MILLION TRUCKS/BUSES
4% of vehicles – 23% of fuel

- Trucks & Buses: 9.9 million = 3.9%
- Passenger Cars: 135.9 million = 53.7%
- Pickups, SUVs, Vans: 101.5 million = 40.0%
- Motorcycles: 7.1 million = 2.6%

- Light Trucks: 4.0 M Bbl = 35.0%
- Heavy Trucks: 2.6 M Bbl = 21.0%
- Motorcycles: 0.01 M Bbl = 0.6%
- Passenger Cars: 4.9 M Bbl = 42.2%
10 MILLION TRUCKS/BUSES

Major Emitters: GHG & Pollution

- **Major urban polluters:** soot, smog-causing NOx & carcinogens

- **Emit 26 % of GHGs** in transportation

- **Refuse/recycling Fleets – top target:**
  180,000 (twice # of transit buses)
  Greatest fuel guzzlers (2.8 miles per gal.)
  Noise pollution disrupts communities, damages workers hearing
10 MILLION TRUCKS/BUSES
Leave Diesel Era Behind! Step 1

NATURAL GAS NOW

- Only commercial option for heavy duty fleets today – all classes
- A century’s domestic supply
- Cleaner - 80% cut in criteria pollutants
- 20% cut in GHGs
- Fuel cheaper & more stable prices
NATURAL GAS REFUSE FLEETS – LONG ISLAND – EAST COAST LEADERSHIP!

<table>
<thead>
<tr>
<th>CNG Refuse Trucks</th>
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<tbody>
<tr>
<td>Smithtown</td>
<td>39</td>
</tr>
<tr>
<td>Brookhaven</td>
<td>67</td>
</tr>
<tr>
<td>Huntington</td>
<td>30</td>
</tr>
<tr>
<td>Oyster Bay</td>
<td>44</td>
</tr>
<tr>
<td>Hempstead</td>
<td>7</td>
</tr>
<tr>
<td>Rockaway</td>
<td>6</td>
</tr>
</tbody>
</table>

1st NYS 100% CNG fleet
NATURAL GAS FLEETS
2009-2010

1st NJ 100% CNG fleet
Hamilton, NJ

Metro Paper Recycling
New York City
NATURAL GAS FLEETS
The “Clean Hankie” Test!
NATURAL GAS REFUELING
1000 US STATIONS*5 on L.I.

Estimated Annual Fuel Savings with CNG/LNG
Class 8 Tractor Trailer $15,000
Garbage Truck $10,000
Transit Bus $8,000
Shuttle $6,000
Taxi $4,000

On LI: Smithtown
Huntington
Brookhaven
Oyster Bay
Hempstead
10 MILLION TRUCKS/BUSES
Leave Diesel Era Behind! Step 2
“RNG” First Sustainable Fuel

Huge domestic renewable resource. Biogases created by organic wastes could displace 25-30% of diesel fuel
- 1,500 EPA regulated Landfills
- 16,500 sewage treatment plants
- Agricultural & dairy wastes
- Anaerobic digesters for faster processing

Supply Potential: greatest biomass resource (usda study)
- Biodiesel: 1 billion gallons MAXIMUM all US sources
- Biomethane: 9.4 billion DGEs from landfills alone

On L.I. BNL/AERTC study found: organic wastes could produce 7.7 billion cubic feet of gas a year!!
RNG/BIOMETHANE (CH4)

First Sustainable Fuel

RNG: Carbon neutral fuel

- Natural gas: 28% lower in carbon density than diesel
- RNG: 88% lower than diesel

CARB data (wells to wheels)
RNG/BIOMETHANE (CH4)
A Commercial Fuel Today

- Powers thousands of vehicles in Europe including:
  - 500 refuse trucks - Madrid
  - 300 city buses - Lille, France
  - Over 760 buses & refuse trucks in Swedish cities
  - 200 buses in Norway

- **Entering US now:** Altamont, CA, Franklin Cy OH, McCommas Bluffs Landfill, TX
## EV BIOMETHANE PROJECT

**How Many Trucks Could Run on NYC’s Wastes?**

<table>
<thead>
<tr>
<th>Year</th>
<th>How Many Refuse Trucks Could Run on NYC Garbage?</th>
</tr>
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<tbody>
<tr>
<td>Year 3</td>
<td>5,536</td>
</tr>
<tr>
<td>Year 6</td>
<td>9,149</td>
</tr>
<tr>
<td>Year 13</td>
<td>10,136</td>
</tr>
<tr>
<td>Year 17</td>
<td>10,723</td>
</tr>
<tr>
<td>Year 21</td>
<td>7,260</td>
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<tr>
<td>Year 24</td>
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The bars show how many refuse trucks, each using 6000 diesel gallon equivalents (DGEs) per year, could be fueled by the biomethane made from 3 million tons of refuse per year, over 20+ years.

**ALL 2,400 DSNY Refuse & Recycling Trucks**

- **Landfill Opens**
- **Landfill Closes**
LEADERSHIP FOR BUSINESSES
Assess your Skills

- **Educate municipal/corporate clients** about near & long term benefits of CNG/LNG

- **Offer planning, design, construction, engineering services**
  - cost/benefit studies; refueling needs, depot modifications; partners needed, identify/pursue funding

- **Propose language** for community waste contracts mandating use of “natural gas” (Smithtown, NY; Hamilton, NJ, etc)
LEADERSHIP FOR ENGINEERS
Show Clients Long Term Goal: RNG

- **Propose organics inventory:** quantity & sources: landfills, transfer stations, wastewater treatment plants, composting operations, pooled wastes from several communities, anaerobic digesters

- **Evaluate gas collection and refining technologies:** what works with what feedstocks

- **Forecast impacts:** cost/savings; GHG reductions; markets for CO2; soil amendments

- **Propose federal policies:** putting use of RNG for vehicles on same footing as RNG for power generation
LEADERSHIP FOR ENGINEERS
Support State/Regional Planning

EV/Rutgers University
“NJ Work Group on RNG”

Goal: To jump start RNG industry in New Jersey

30 public/private sector leaders work to identify:
- RNG feedstocks
- Technologies
- Action steps
- policy needs

Outreach to Implement
WHAT'S AT STAKE?
For more information, articles, publications, corporate memberships

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