

# **“Driving Towards a Cleaner Environment”**

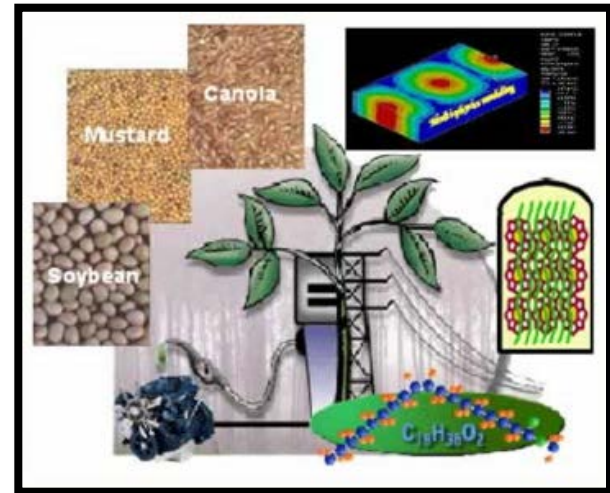


*Spiro Kattan, Supervisor  
Clean Fuels & Technologies Division*

*Northeast Diesel Collaborative – September 11 – 13, 2013  
Business Best Practice: How Improving Air Quality through Innovation Promotes Sustainability*

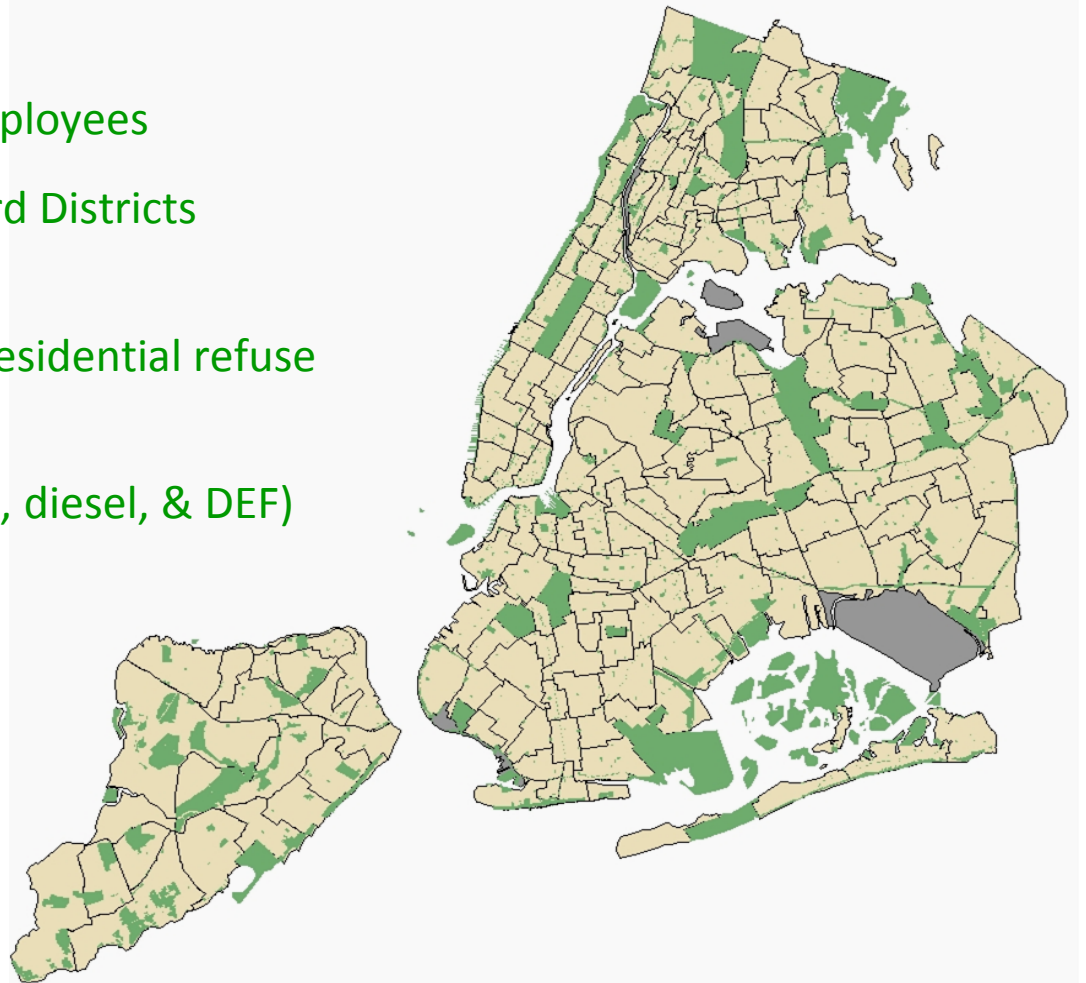
# Overview

- About DSNY
- Environmental Laws & Initiatives
- Alternative Fuels/Technologies
- Key Steps Towards Sustainability



# About DSNY

- Approximately 10,000 employees
- Serve 59 Community Board Districts throughout 5 Boroughs
- Collect approx. 12k tons residential refuse each day
- On-Site Fueling (unleaded, diesel, & DEF)
- **Decentralized Operation**



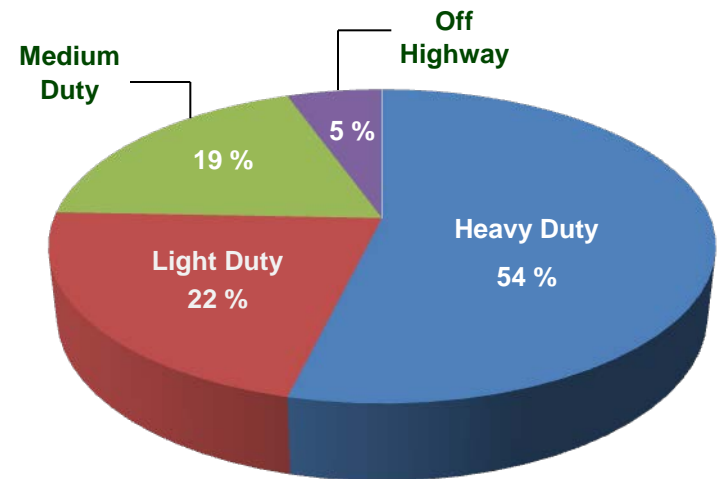
# Our Responsibilities

- Street Cleaning
- Refuse Pickup & Recycling
- Snow Removal (6,000 street miles)
- Special Events Cleanup (parades, etc.)
- Freon Recovery (refrigerators, A/C)
- Derelict Vehicle Removal (abandoned, stolen)
- Graffiti Removal (buildings, city property, etc.)
- **Natural Disaster Response (Hurricane Sandy)**

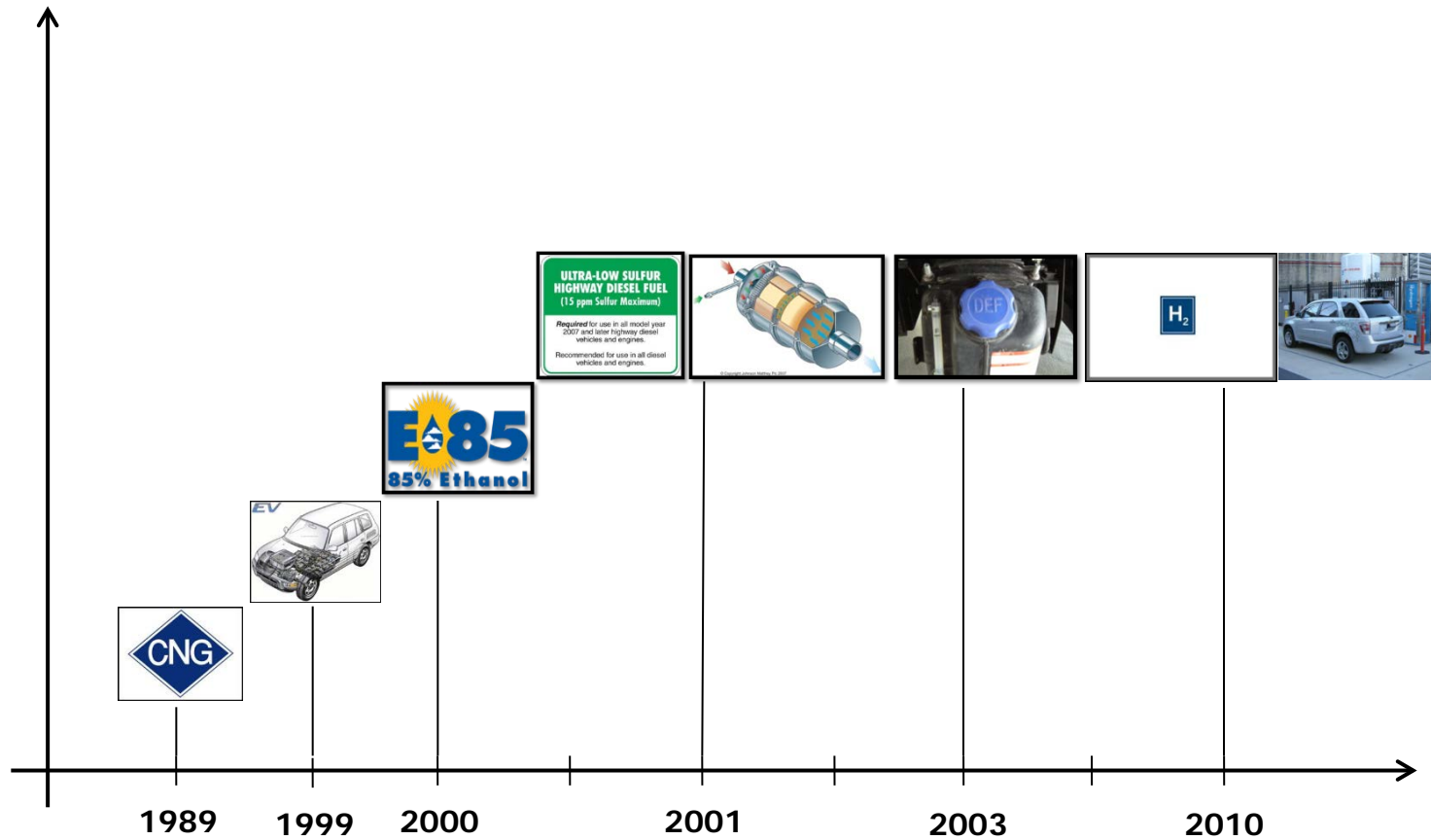


# DSNY Fleet

Collection Trucks (rear-load)	1,666
Collection Trucks (Dual-bins)	405
Collection Trucks (front-load)	99
Salt Spreaders	374
Street Sweepers	440
Off-road	300
Light Duty Fleet	1,169
Other	1,004
<b>Total</b>	<b>5,457</b>



# Past Pilots & Demonstration Projects





## Local Laws / Mayoral Initiatives

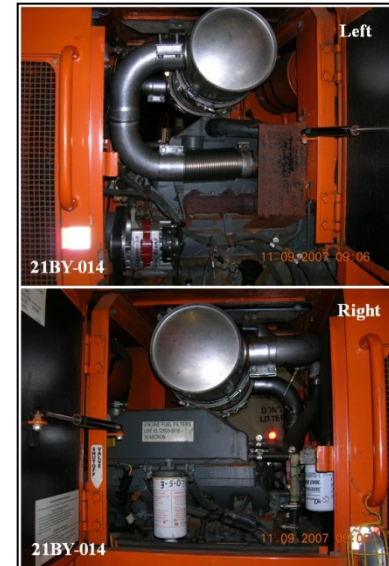
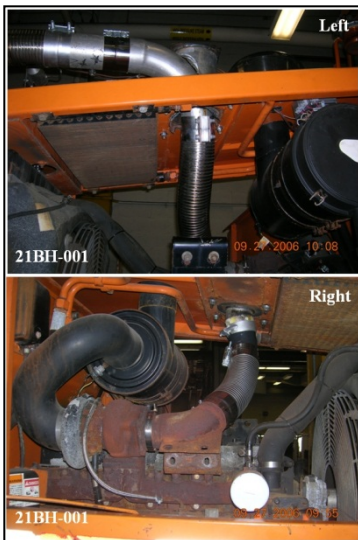


- LL# 77 (2003) BART all Off-highway diesels
- LL# 39 (2005) BART all On-highway diesels
- LL# 38 (2005) LD California LEV II “**Best in Class**”
- **PLaNYC** (2007) 30% reduction GHG by 2017

# Local Laws #77 & #39



## 1000 + Retrofits

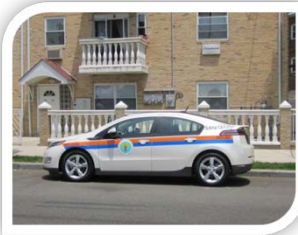




# Emission Control Product Verification



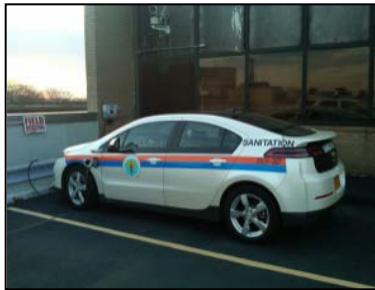
# Local Law #38



Plug-in & HEV	
Chevy Volt	21
Ford Transit Connect	2
Navistar eStar	1
Nissan Leaf	18
Ford Escape	227
Ford Fusion	15
Ford Fusion	136
Honda Civic	18
Toyota Highlander	18
Toyota Camry	5
Toyota Prius	347
<b>808</b>	

# EV Charging

**EV**



+

**Charge Pass**



=

**Charger**

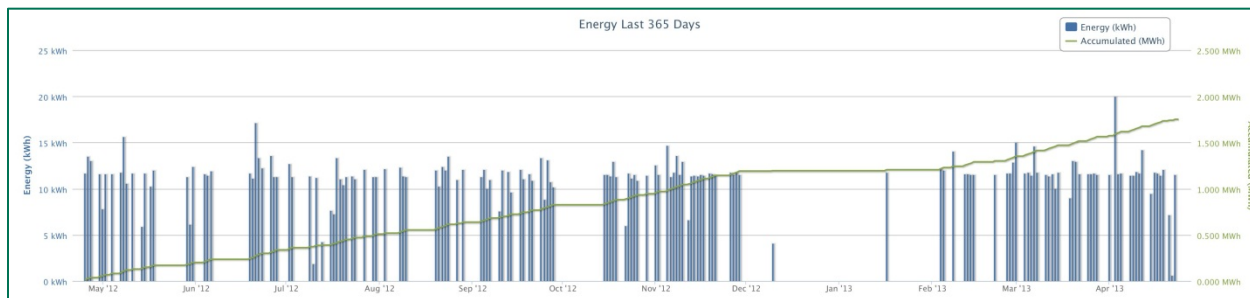
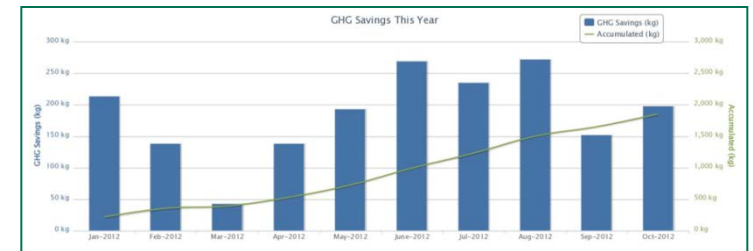
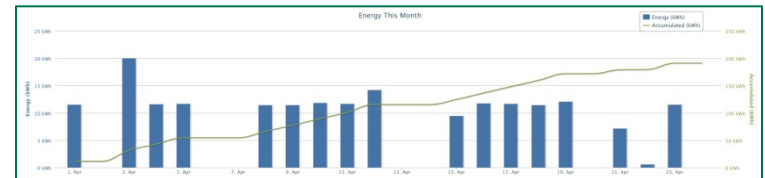
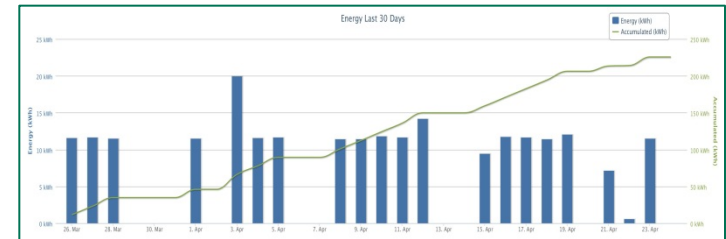


# 49 Level II EV Charging Stations Citywide





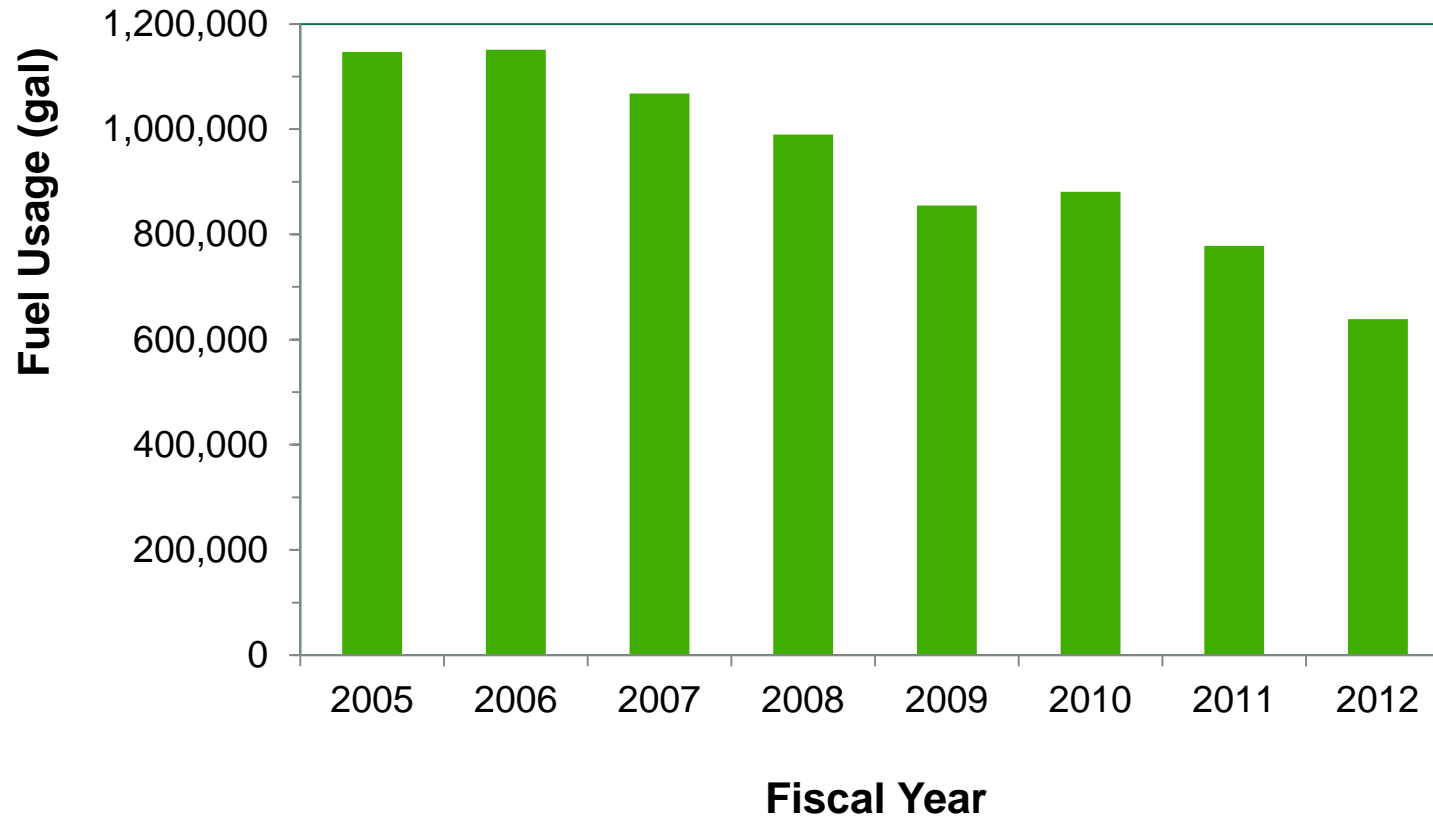
# ChargePoint Network





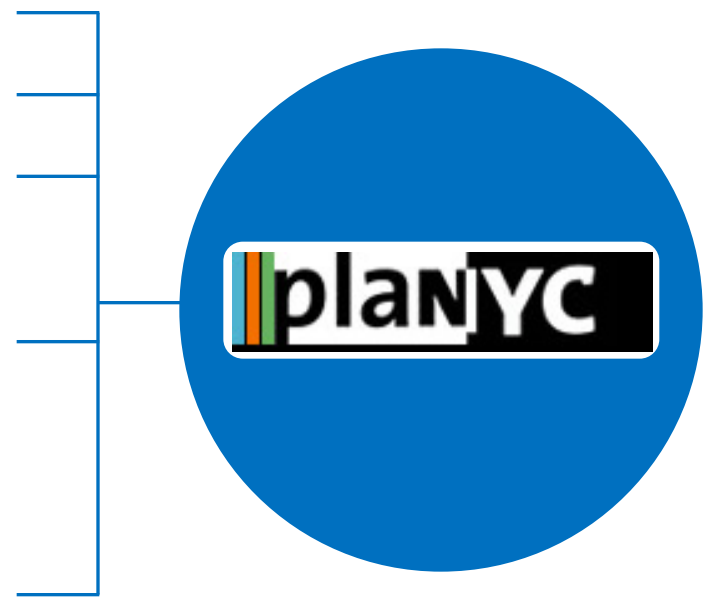
# Unleaded Fuel Usage

Dramatic Reduction



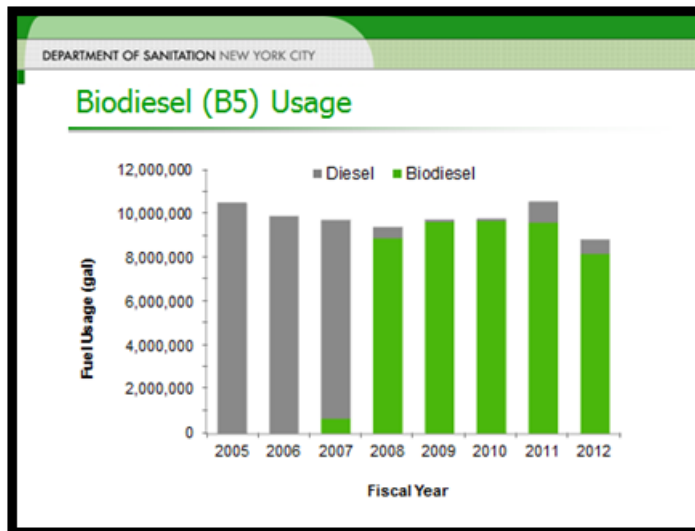
# Heavy-Duty GHG Reduction Plan

Collection Trucks (rear-load)	1,666
Collection Trucks (Dual-bins)	405
Collection Trucks (front-load)	99
Salt Spreaders	374
Street Sweepers	440
Off-road	300
Light Duty Fleet	1,169
Other	1,004
<b>Total</b>	<b>5,457</b>



# Biodiesel

- Pilot testing in 2007
- B20 April – October
- B5 November to March
- Displaced ~ 2,000,000 gallons of Fossil Fuels (petroleum) to date



# Compressed Natural Gas Fleet



## Global Environmental Products

CNG Sweepers	20
CNG Refuse	43
<b>63</b>	



## Crane Carrier & Mack Trucks

## CNG - Challenges

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- Lack of Citywide Heavy-Duty Infrastructure
- ~~Range~~
- ~~Fuel Cost~~
- ~~Reliability~~
- ~~Engine Options~~
- ~~Incremental Cost~~

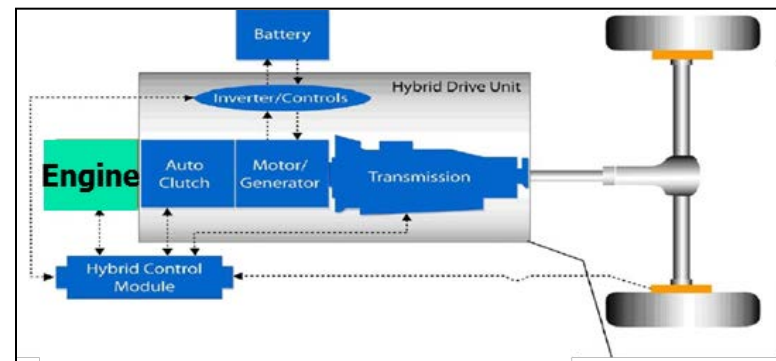
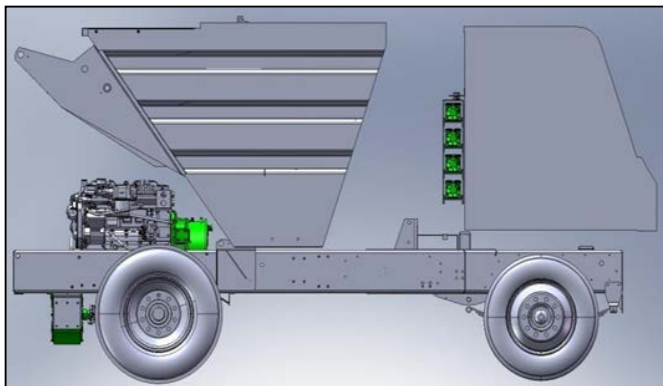


# Hybrid Sweepers & Rack Trucks

HEV Sweeper



HEV Rack

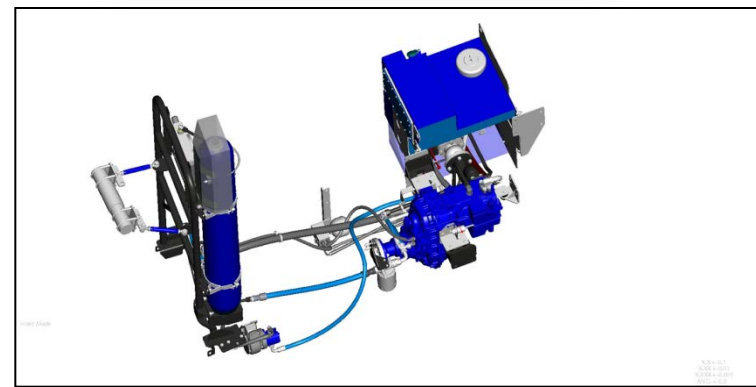
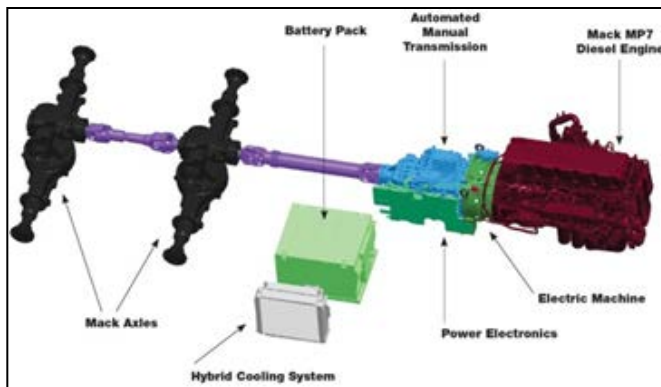


# Hybrid Refuse Trucks

Mack w/HEV



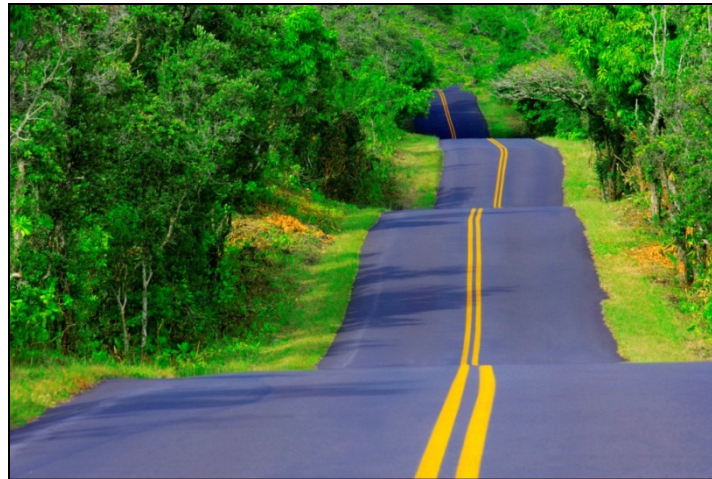
Mack w/Bosch HRB



## Road to Sustainability...

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- Understanding the technology
- Identifying & collecting key metrics
- Planning & Implementation
- Secure Funding
- Technical Training



## Understanding The Technology...

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- How it works
- Potential efficiency
- Fuel Cost (CNG, biodiesel, electric, etc.)
- Incremental Cost
- Infrastructure needs/costs
- Can it meet operational expectations (plow snow?)

## Understanding The Technology (Cont'd)

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- Reliability (up-time)
- Transparency (operator/operation)
- Lead-times (delivery schedule)
- Will the technology work with our duty-cycle
- **Is there a pay-back?**



# Identifying & Collecting Key Metrics

The image displays several screenshots from a fleet management software interface, with callout boxes identifying key metrics:

- GGE** (Gallons per Gallon Equivalent): Located in a yellow box on the left side.
- True Idle**: Located in a light blue box on the left side.
- Sweet Spot**: Located in a light blue box on the left side.
- Average Speed**: Located in a light blue box on the left side.
- Service Brake Time**: Located in a light blue box at the bottom center.
- Qualified Idle**: Located in a light blue box at the top center.
- MPGe** (Miles per Gallon Equivalent): Located in a light blue box at the top center.
- MPG** (Miles per Gallon): Located in a light blue box at the top center.
- kWh** (Kilowatt-hours): Located in a yellow box at the top center.
- Total Fuel Used**: Located in a light blue box at the top right.
- Brake On Time**: Located in a light blue box on the right side.
- PTO Hours** (Power Take-Off Hours): Located in a light blue box on the right side.

The screenshots show various data tables and reports, including:

- ECM Value Table:**

Name	ECM Value	Units
Fuel Used	3.4	gal
Fuel Consumed for Aftertreatment Injection	2678.9	gal
Idle Fuel Used	184.5	gal
Gas Used	Not Available	
Diesel Gas Used	Not Available	
Gas Used	Not Available	
Idle Gas Used	Not Available	
PTO Gas Used	Not Available	
Fuel	Not Available	
Adjustable Fuel Economy Total Time	Not Available	
Adjustable Fuel Maximum Economy Total Time	Not Available	
- Service Diagnostics Table:**

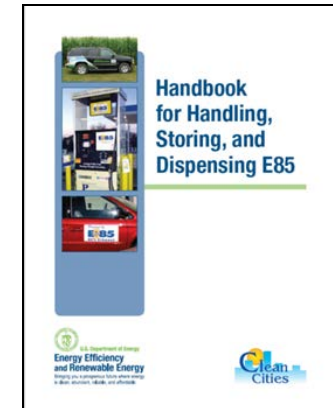
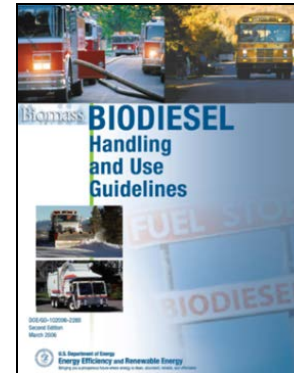
Description	Value	Description	Value
Maximum Road Speed Limit	55 mph	Time Distance	5021.6 mi
Road Speed	57 mph	Total Vehicle Distance	5021.6 mi
Total Idle Hours	227.8 h	Rated Engine Power	200 hp
Total Vehicle Hours	6847.5 h		
Total PTO Hours	682.5 h		
Total Engine Hours	4705.9 h		
Powered Engine Load (Pwr/Tong)	85%		
Current Level	100%		
Engine Oil Level	0%		
Idle Engine Speed	0%		
Total Fuel Used	0%		
Total Fuel Used	0%		
Engine Vehicle Battery Voltage	0%		
Fuel Economy	0%		
- Life and Trip Reports Table:**

Time	Fuel	Distance	Consumption
1. Moving	499.0	3164.4	12.453.7
2. Cruise Control	0.0	0.4	1.9
3. Idle (all)	499.0	1896.3	-
4. Idle (Fuel)	509.0	865.9	-
5. Qualified Idle	293.3	954.4	-
6. PTO 1	104.5	161.6	-
7. PTO 2	0.0	0.0	-
8. PTO Moving	0.7	2.0	3.9
9. PTO Stopping	0.0	0.0	0.0
10. Electronic Hand Brakes	1.0	1.7	0.0
11. Sweet Spot	209.6	904.9	5793.6
12. Total	1712.9	4164.0	12495.7
- Carbon Footprint Table:**

Category	Description	Parameter Value	Units
Operational Data	Total Fuel Used	164.73	gal
Operational Data	Engine Fuel Rate	31.95	gal/h
Operational Data	Current Fuel Economy	10.00	mpg
Operational Data	Average Fuel Economy	8.00	mpg
Operational Data	Trailer Vehicle Distance	2192.75	mi
Operational Data	Trailer Average Fuel Rate	16.93	gal/h
Operational Data	Trailer PTO Fuel Used	48.637	gal
Operational Data	Diesel Particulate Filter	Not available	
Operational Data	Battery Potential / Power Input 1	11.95	vdc
Operational Data	Engine Oil Pressure	30.00	psi
Operational Data	Engine Coolant Level	100.00	%
Safety Information	Handbraking Level	0	
Safety Information	RapidAccel Event	0	
Time Usage	Total Hours of Operation	797.76	hours
Time Usage	Trailer Time	0	minutes
Time Usage	Calculated PTO Time	0	minutes
Time Usage	PTO Value	0.0	

# Planning & Implementation...

- Research
  - Working groups (DCAS & HTUF)
  - Seminars/Workshops
  - White papers
  - Networking
- Budgeting
  - Seek funding (federal, state, local)
- Start small with Pilot/Demonstration




# Funding

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- Goes towards the incremental cost
- Local (PlaNYC)
- State (NYSERDA)
- Federal (CMAQ)
- To get the funding
  - Must qualify
  - Fill out a grant application
  - Required to track and provide “Progress Reports”
- To find the funding
  - Mailing list <http://www.grants.gov/>
  - Member of local Clean Cities Coalition

# Technical Training

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- Various Levels
  - I (Safety & Familiarization)
  - II (Maintenance)
  - III (Advanced Diagnostics)
- Access to technical information (sometimes this requires a subscription!)
- Diagnostic Tools & Software
- Must Include
  - Operators
  - Mechanics
  - Supervisors

**Don't leave anyone out**

# Achieving PlaNYC Goals



- Less idling
- Alternative fuels
- Hybrid vehicles
- Pure & Plug-in electric
- Fleet down-sizing
- Vehicle right-sizing (smart-spec'ing)
- Reduce travel miles



# Citywide Initiative!



City of New York  
Parks & Recreation



**THANK YOU!!**

**Spiro Kattan**

Supervisor of Mechanics

N.Y.C. Department of Sanitation

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