

A Case for Change

Greening our Fleet

TDEC Sustainable Transportation Forum

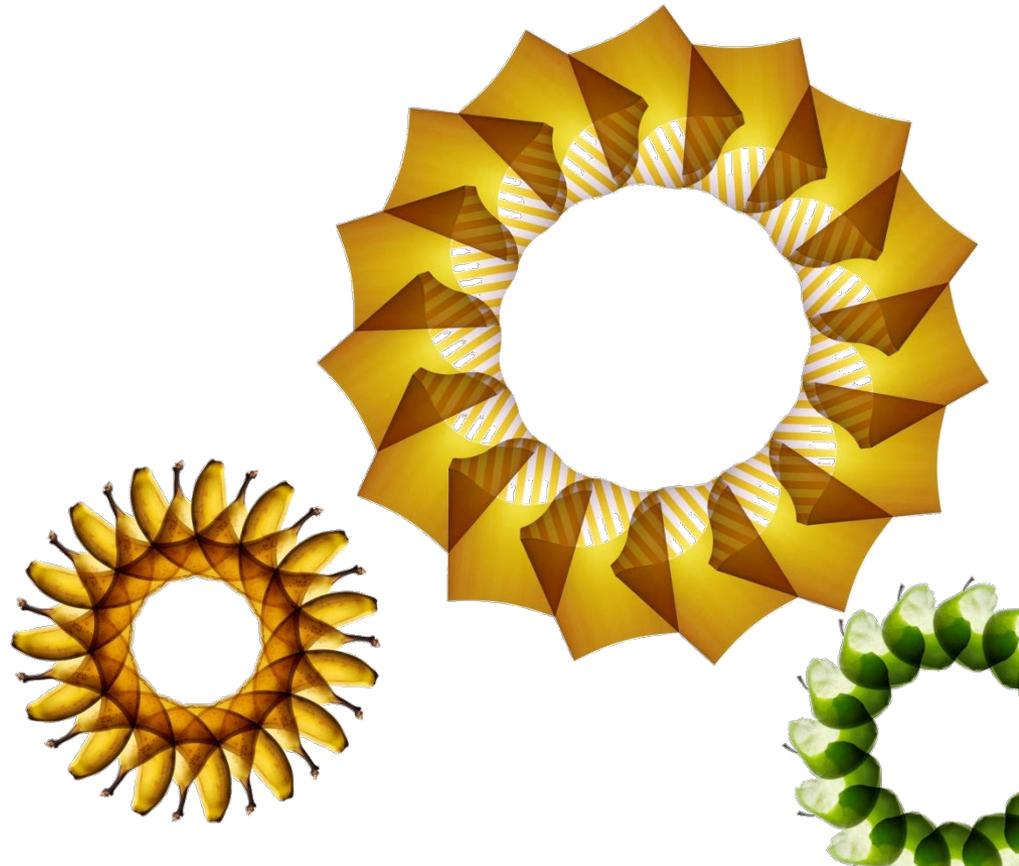
May 12, 2016

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Waste Management's Transformation

WM's Sustainability Goals

By 2020 We Will:

- Double the amount of waste-based energy we produce - to power over 2 million homes.
- Triple the amount of recyclables we collect - to over 20 million tons per year.
- **Decrease our fleet emissions by 15% and improve our fuel efficiency by 15%.**
- Protect more wildlife habitat at our landfills by certifying 25,000 acres through the Wildlife Habitat Council. Goal met in 2010, we plan to keep going.

Instructions

Count how many times the players wearing white pass the basketball.

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2008 fleet dilemma

- Changing diesel engine regulations – created uncertainty
- Impact of new regulations
 - 10% Heavier trucks = 10% less payload = %10 need for more trucks = 10% increase emissions and ?? Increased operational costs
 - Uncertain maintenance costs associated with new diesel trucks
- Uncertain Fuel Expense
- Unreliable Technology

We had a difficult decision to make – what type of trucks to purchase?



2008 fleet solution

- Changing diesel engine regulations – created uncertainty
- Impact of new regulations
 - 10% Heavier trucks = 10% less payload = %10 need for more trucks = 10% increase emissions and ?? Increased operational costs
 - Uncertain maintenance costs associated with new diesel trucks
- A domestic source of natural gas was discovered that greatly reduced the cost of delivery and reduced our dependence on foreign oil.
- Cummins Westport developed an engine that got the job done and included an excellent warranty.



WM's Fleet Goal: Reduce emissions and increase fuel efficiency by 15% by 2020

- WM will replace 80% of its new class 8 vehicles with natural gas trucks.
- We will build 25 natural gas fueling stations each year
- We are investing in public fueling stations at most sites



Benefits of 15% Emissions Reduction

- **Overall**

- **350 million gallons** fuel saved per year
- **3.5 million metric tons** GHG reduced.

- **Per Truck**

- **8,000 gallons** per year fuel saved
- **22 metric tons** of GHG each year.

CNG has a significant advantage over 2010 diesel emissions in WM duty cycle ...

Emissions	2010 Diesel (gms/gallon) 	Natural Gas (gms/diesel gallon equivalent) 
Carbon Dioxide (CO ₂)	10,510	4,460
Nitrogen Oxide (N ₂ O)	2.03	0.58
Particulate Matter (PM)	0.1299	0.0090
Methane (CH ₄)	0.58	0.50
Payload loss	-2k lbs.	0
Purchase Cost	\$295K	\$320K

Status of WMs Green Fleet Transition

- We are investing in new natural gas fueling stations to support our fleet:
 - 5,000 NGV vehicles operating daily
 - 84 stations operational by year end 2015.
 - 13 new CNG fueling stations opened In 2015 – 7 more are under construction
 - 25 stations have public access & another 7 have public access for pre-approved customers
- Transitioning in large districts with over 75 trucks first

WM Nashville Operations

- Service Area – Davidson, Rutherford, Williamson, Wilson, Sumner, Cheatham, Dickson and Robertson County
- Routes – Average 80 routes daily between Commercial, Roll Off and Residential business
- Equipment – Total of 90 trucks in our current fleet



Nashville 2016

- Complete 3-year – \$30 million investment
- Public fueling station open and operational



Fueling Infrastructure

- **Fast-Fill**
 - Can fill at rates of 10 gallons per minute (DGE)
- **Time-Fill**
 - Fills entire fleet overnight, plug-in fuel hose, low labor



Plans for Nashville 2016



- Added 25 trucks each year in 2014, 2015 and 2016
- Investment of roughly \$8 million per year.

New Generation Natural Gas Trucks are a Success

Economic Benefits

- CNG vehicles operate more efficiently by providing lower maintenance costs, superior performance relative to their predecessors, and decreased fuel costs.

Environmental Benefits

- These CNG-powered vehicles emit nearly zero air particulates and cut greenhouse gas emissions by up to 25%.
- GHG savings equivalent to removing nearly 300 passenger vehicles from the road.

Community Benefits

- Our CNG trucks are significantly quieter than traditional diesel trucks allowing us to further minimize disruptions during garbage and recycling collection.
- Our public CNG fueling station is able to support our customers' initiatives as well as our own.

WWM®

WASTE MANAGEMENT