UPS Alternative Fuel Fleet Summary - 2016

Mike Casteel

Director of Fleet Procurement

We've been looking for solutions for a long time

...

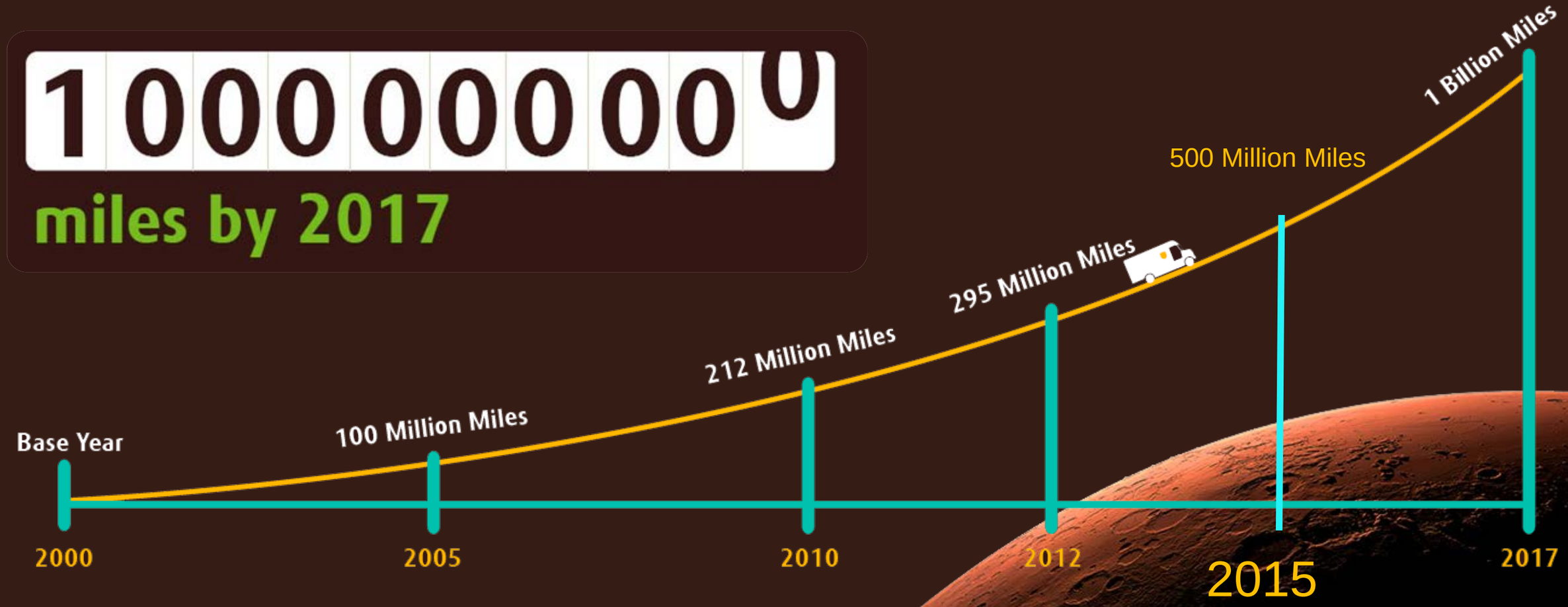
UPS Delivery Center
New York City
Circa 1930s

UPS Alternative Fuel Fleet - Recent Activity

- UPS has been working with and exploring alternatives to gasoline and diesel for a long time. Relative to our fleet size, deployment has been on a small scale and often characterized as experimental more so than practical.
- In 2013, we began a multi-year initiative to build an extensive alternative fuel infrastructure system to support a significant increase in the size of our alternative fuel fleet.
- Natural Gas – LNG and CNG – today's best alternative for wide scale use
  - By the end of 2016, we will have 15 LNG stations and 31 CNG stations in operation which will support 2500 class 8 natural gas tractors and close to 1700 medium duty CNG delivery trucks.
- Propane
  - In 2015, we installed 53 propane stations at UPS sites which now support over 1000 medium duty propane delivery trucks

UPS Alternative Fuel Fleet – Recent Activity Continued

- Other Technologies continue to be evaluated under real world conditions although in smaller deployments including HEVs, HHVs, EVs.
- By the end of 2016, the UPS alternative fuel fleet will displace approximately **60 million gallons** of conventional diesel and gasoline every year.
  - Natural Gas and Propane vehicles are deployed on higher than average mile routes to achieve maximum fuel use/savings.
  - Maintenance cost on par with traditional fuel vehicles.
- Fuel Economics
  - Natural Gas and propane both provide for less fuel cost volatility than conventional crude petroleum products along with improved emissions.



14 Round Trips to Mars

Why Natural Gas?

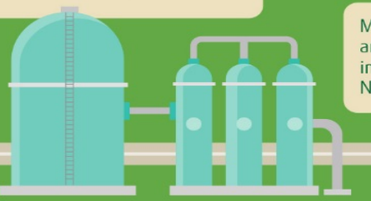
- **Class 8**
  - **For heavy duty trucking in North America, Natural Gas is the only alternative to diesel which can perform the same work as diesel on the same large scale. Most importantly, Natural Gas is clean burning, proven technology with wide-spread availability, has a highly efficient distribution infrastructure and is cost effective.**
- RNG
  - Natural gas is mostly Methane.
    - Methane (CH4) is the simplest and purest hydrocarbon fuel on the planet.
  - Methane is a naturally occurring energy source created by decomposition of organic matter in facilities such as landfills, wastewater treatment plants and farming/dairy operations.

Trash to Gas

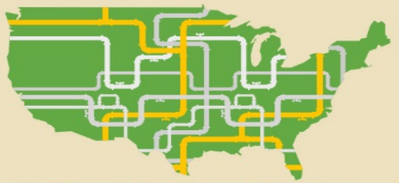
Renewable Natural Gas

Renewable natural gas (RNG), also known as biomethane, can be derived from many abundant, renewable sources including decomposing organic waste in landfills, wastewater treatment and agriculture. RNG can be used in any natural gas vehicle. UPS's rolling laboratory approach provides a unique opportunity for UPS to test different fuels and technologies and positions UPS to use RNG in its extensive natural gas fleet.

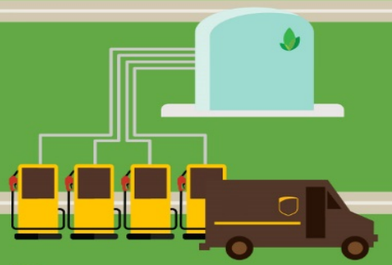
Naturally occurring methane is captured before it is released into the atmosphere as a greenhouse gas emission.



Methane is purified and processed into Renewable Natural Gas (RNG).



The RNG is distributed across the country through natural gas pipelines.



RNG reduces harm to the environment because it captures naturally occurring methane before it is released into the atmosphere as a greenhouse gas emission, turning that methane into a safe, usable fuel that displaces the conventional fuel (and its carbon emissions) that we would otherwise use.

The total production cycle of RNG results in GHG emissions that are up to **90% less** than diesel.

UPS is working toward its goal of driving **1 billion miles** with its alternative fuel and advanced technology fleet by the end of **2017**.

By **2017**, our alternative fuel and advanced technology fleet will enable us to avoid as much as **12%** of our annual conventional gasoline and diesel fuel use.

Natural Gas Emissions

- At the tailpipe
  - Natural gas reduces heavy duty tailpipe CO2 equivalent emissions by 10% to 25% depending on engine technology.
  - When we can use RNG in the mix, the California Air Resource Board estimates RNG provides up to a 90% reduction in carbon emissions when compared to conventional fuel.
- RNG Supply
  - RNG supply is limited. Economics depend largely on the Federal Renewable Fuel Standard (RFS) program and related Renewable Identification Number (RIN) values.
  - RFS Program currently planned to run into 2022.
  - Current RIN values are high, but long term RIN values are unclear making it difficult (risky) to invest in additional RNG production.

Putting things in perspective ....

- While fossil based natural gas emission profiles are better than diesel or gasoline, they get much better when adding bio-methane (RNG) to the mix.
- To illustrate the potential, for every 1 million gallons of RNG used in heavy duty transportation, 10,000 metric tons of CO2 are avoided.
- For UPS, the potential use of 60 million gallons of RNG is equivalent to taking 600,000 metric tons of CO2 out of play. What does this really mean?

Our investment in CNG and LNG natural gas infrastructure now allows us to seamlessly transition to renewable natural gas when available. At UPS, the potential use of 60 million gallons of RNG would be equivalent to taking 125,000 automobiles or 32,000 delivery vehicles off the street each year.

UPS Alternative Fuel Program – Beyond 2016

- UPS will continue to evaluate all alternative fuel and vehicle technologies.
- Continued deployment of natural gas vehicles and infrastructure will continue to be the most likely avenue for large scale expansion.
  - Becoming more difficult with current petroleum prices
- Regulations – State and Federal
  - Clarity and Commitment are needed for more wide scale adoption during time of low oil prices.

Oil prices rise, investments in alternatives increase. Oil prices go down, alternative fuel investments dwindle. A cycle that has been repeated several times in the past few decades. Are we going to repeat the cycle again?

Thank you