Presentation to DelMarVa Freight Summit

"Alternative Fuel Vehicles at UPS, With Focus on Natural Gas"

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An "All-of-the-Above" Strategy

"As the folks here at UPS understand, we've got to have an all-out, all-in, all-of-the-above strategy that develops every source of American energy."

-Barack Obama,
Jan. 26, 2012

What I Want to Leave You With

- Overview of the UPS alternative fuels fleet including natural gas powered vehicles
  - End of 2014
  - Projected end of 2015
- How UPS decides to deploy alternative fuel vehicles: what vehicles and where?
- Why UPS needs such a wide array of types of vehicles
- History of use of natural gas in vehicles and at UPS
- Future challenges for natural gas as a truck fuel
- Other truck issues

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Total Alternative Fuel & Technology Vehicles

5,088 total vehicles in service as of 12/31/14

U.S. Small Package Fleet: 4,003

(4.6% of US Small Pkg Fleet)

- Compressed Natural Gas Vehicles: 1,071
- Liquid Natural Gas Vehicles: 1,249
- Hybrid Electric Vehicles: 380
- Electric Vehicles: 102
- Hydraulic Hybrid Vehicles: 41
- Propane Vehicles: 760
- Composite Body Diesel: 400

International Small Package Fleet: 1,085

(7.3% of International Small Pkg Fleet)

- Propane Vehicles: 836
- Compressed Natural Gas Vehicles: 84
- Electric Vehicles: 78
- Ethanol Vehicles: 62
- Biomethane Vehicles: 19
- Hybrid Electric Vehicles: 6

Planned Global Alternative Fuel and Advanced Technology Vehicles Approved to Deploy through 2015: 7,781

U.S. Small Package Fleet: 6,480

(7.5% of US Small Pkg Fleet)

- Compressed Natural Gas Vehicles: 3,091
- Liquid Natural Gas Vehicles: 1,249
- Hybrid Electric Vehicles: 380
- Electric Vehicles: 120
- Hydraulic Hybrid Vehicles: 41
- Propane Vehicles: 1,182
- Composite Body Diesel: 400
- Hydrogen Vehicles: 17

International Small Package Fleet: 1,301

(8.8% of International Small Pkg Fleet)

- Propane Vehicles: 1,019
- Compressed Natural Gas Vehicles: 84
- Electric Vehicles: 111
- Ethanol Vehicles: 62
- Biomethane Vehicles: 19
- Hybrid Electric Vehicles: 6

Planned Alternative Tech Vehicles (U.S. & International): 7,781

In DELMARVA in 2015

- VA: 117 CNG tractors (Richmond, Roanoke)
- VA: 111 CNG package cars (Richmond, Roanoke
- What is unusual here – no State incentives
- Virtually all UPS alternative fuel deployments involved federal or state subsidies
- What goes into the decision to deploy – what and where?

Why Does UPS Need Such a Diversity of Vehicle Options?

Environmental Requirements and Prices of Fuel Vary Dramatically Worldwide

Europe

- Increasingly concerned about:
  - air quality emissions
  - noise and congestion
  - expect vehicle operators to contribute to the solutions
  - climate issues

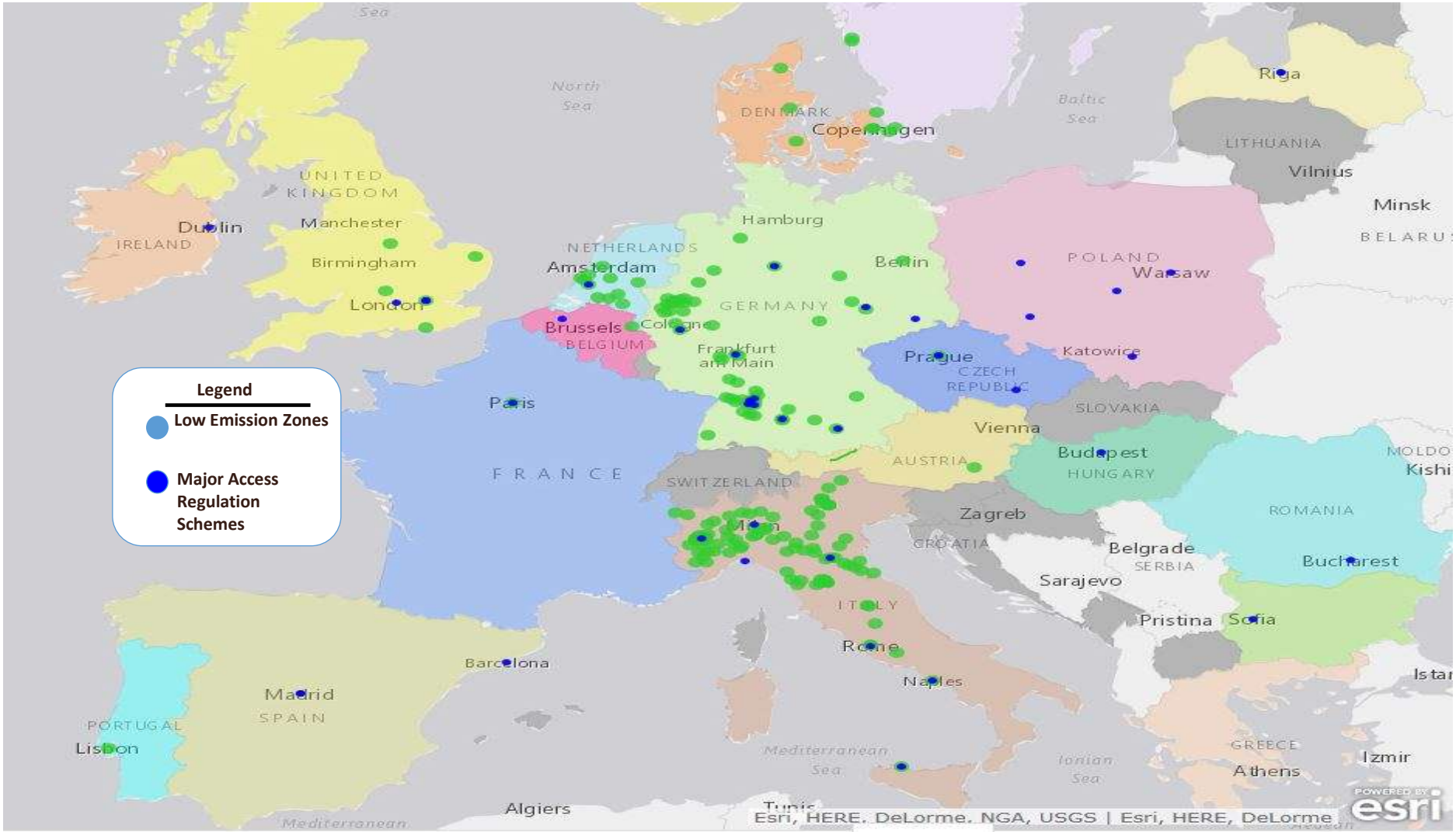
- Extensive Low Emission Zones (LEZ)

- Conventional vehicle access prohibited to parts of the city due to air quality concerns

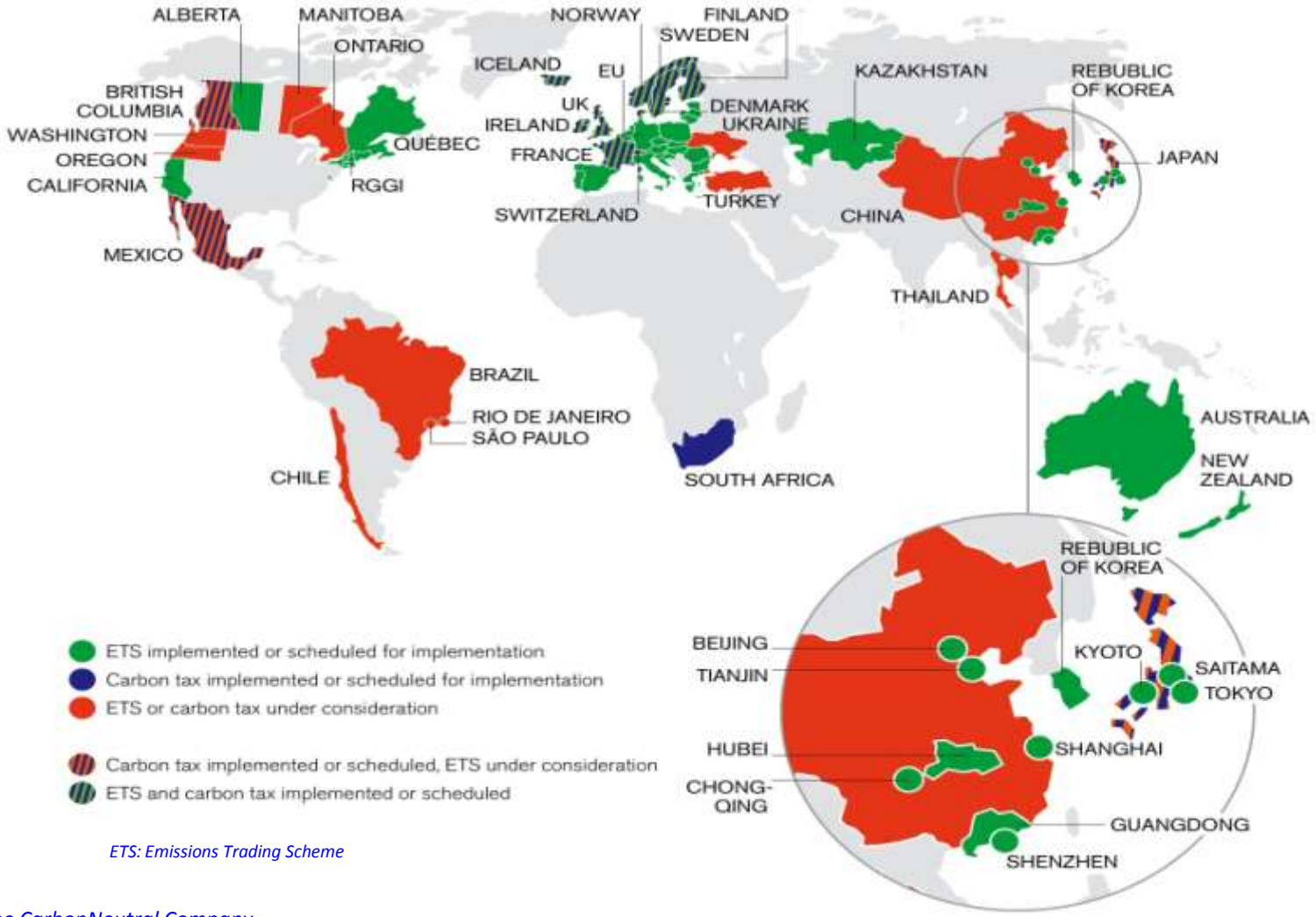
Paris: World's Dirtiest Air in March, 2015

Paris's air pollution: worse than Delhi, India and Peking, China

Urban Access Restrictions in Europe



Global Emissions Trading Schemes & Carbon Taxes



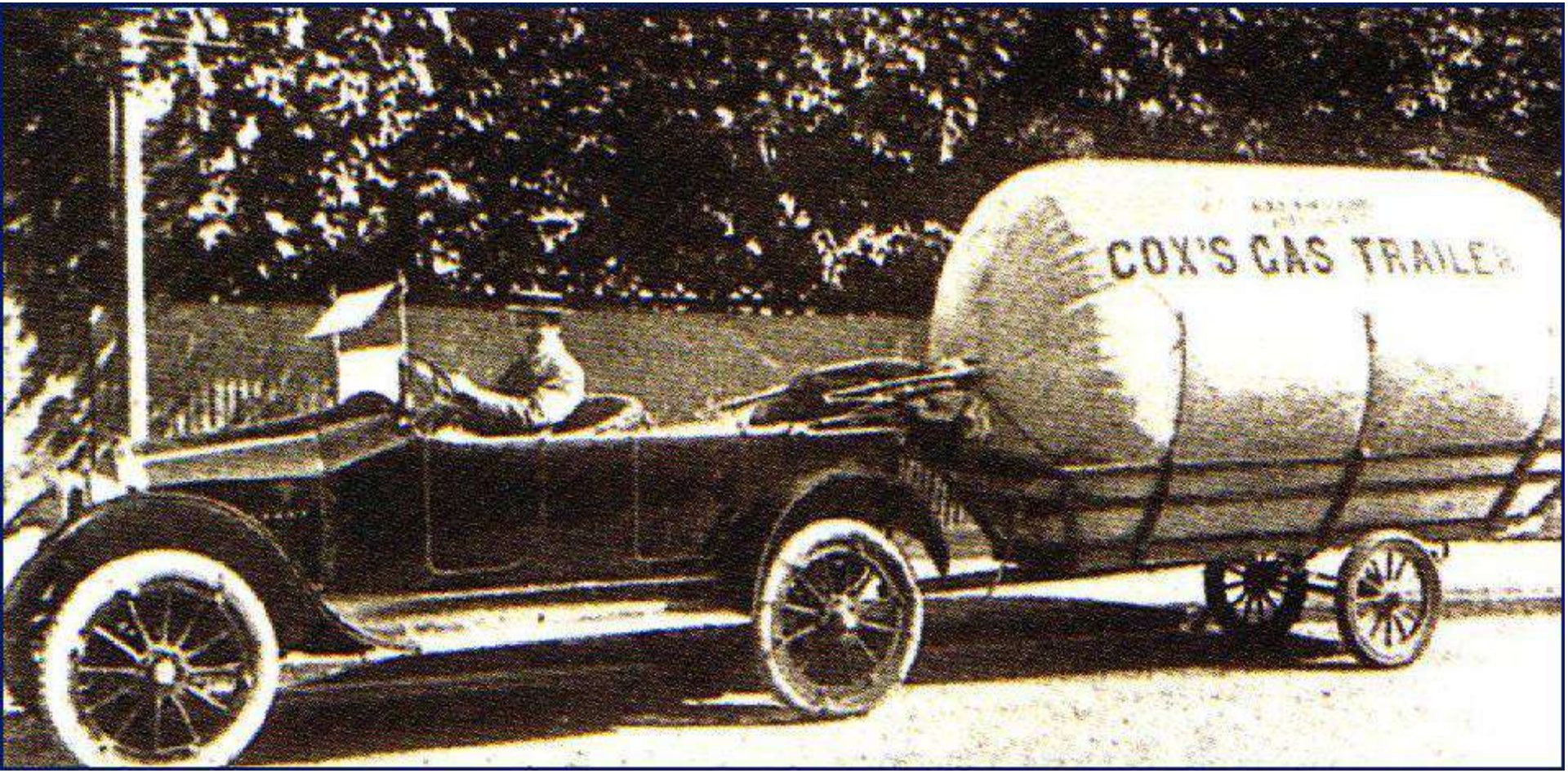
ETS: Emissions Trading Scheme

Source: The CarbonNeutral Company

Heavy Trucks and Natural Gas

- 1821 1st natural gas well dug 27 feet deep, in NY State by hand with shovels, gas pipeline was hollowed-out logs sealed with tar and rags.
- 1933 Mack introduced the first diesel truck, which swept heavy trucking and diesel displaced gasoline very quickly after World War II.
- UPS began using compressed natural gas (CNG) in delivery vans in 1980's
- In heavy trucks, there was no viable alternative to diesel until after 2000.
- UPS began using liquid natural gas in 2002 in heavy tractors as CNG lacked range.
- (Sufficient range is now available in CNG tractors due to new storage cylinders)
- Natural gas was cheaper, cleaner, and domestic
- A long road of innovation

1920's Cutting Edge Car



Further Advances in the 1930's

Chinese Natural Gas Vehicles: 1980's

2015 Mack LNG

2015 Kenworth CNG

But Natural Gas Is Still A Fossil Fuel

Potential for Transition to Renewable Fuels?

- UPS will have over 4,400 trucks on natural gas by end of 2015, over half our "rolling laboratory"
- Does not count 64 LNG tractors UPS just announced it will buy for heavy freight division
- Cheap natural gas and government incentives made these vehicle purchases and infrastructure possible
- The next chapter: Renewable Natural Gas (RNG) from "anything that rots"
- Cut carbon emissions by more than 90% --- Why?
- May 5, UPS announces it is buying RNG for 400 package cars in California – 1.5 million gallon equivalents


Dual Fuel
Biomethane
Vehicle
ups

Other Issues for UPS Trucking

- Environmental:
  - Pope's encyclical
  - Other groups' shareholder resolutions
  - Climate change
  - "Drop-in synthetic diesel" -- 2.5 million gallons in 2014
- Highway Trust Fund and the fuel economy penalty of poor infrastructure
- Fuel Efficiency of spark-ignited LNG/CNG Trucks compared to diesel/LNG/CNG dual fuel
- EPA proposed Phase II heavy truck standards

Another Part of Our Rolling Laboratory
– Bikes to Trikes
Back to our Roots?

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ups
Worldwide Services
Synchronizing the world of commerce
Low Emission
Hydraulic Hybrid

Thank you.