An EarthX Clean Transportation Workshop

Sirens, Schools and Shippers
Efficiency Solutions for Fleets Serving Our Communities

April 26, 2019
The Briscoe Carpenter Center at Fair Park in Dallas, TX

The world is in the midst of the biggest transportation transformation in history since the introduction of the first automobile in the late 1800s. Vehicles powered by cleaner, more efficient fuels such as propane, natural gas, electricity, advanced ethanol, and biodiesel are beginning to take hold in the marketplace. Many Industry and government leaders are taking steps to transition their fleets to new, advanced technologies because they are more efficient, require less maintenance, save fuel costs, and improve air quality.

This workshop will address transitioning fleets to more efficient vehicles in the following sectors:

- School Buses
- Emergency Response Vehicles
- Delivery Vehicles

Experts in advanced technologies and experienced fleet managers will provide hands-on information on:

- the benefits of transitioning their fleets;
- the challenges they face;
- strategies for overcoming the challenges; and
- how to pay for the new vehicles.

AGENDA

7:45-8:30 am **Registration and Coffee**

8:30-8:45 **Welcome and Opening Remarks**
Phillip Wiedmeyer, Vice President, Transportation Energy Partners
Trammell Crow, Founder, EarthX
Lori Clark, Dallas-Fort Worth Clean Cities
Ben Garcia, Vice Chair NAFA Fleet Management Association, South Central Chapter

8:45-10:00 **Break-out Sessions**

Presentations and workshop materials will be posted online at www.dfwcleancities.org/dfw-clean-cities-meetings by Friday, May 3. Email cleancities@nctcog.org with any questions.
Special thanks to the Propane Education and Research Council and Roush for their support of this event!

School Buses
Stephen Russell, Coordinator, Massachusetts Clean Cities Coalition
Stephen Whaley, Propane Education and Research Council (PERC)
Jason Wilcox, Physical Scientist, US EPA Transportation & Climate Division
Amanda Guthrie, Technical Specialist, Texas Commission on Environmental Quality
Moderator: Jonathan Overly, Executive Director, East Tennessee Clean Fuels

Emergency Response Vehicles / Delivery Vehicles
Frank Granados, Senior Advisor, Rio Rico, AZ Medical and Fire District
Francis Hart, Fleet Manager, Polk County, FL Sheriff's Office
Bob Gerber, Partner & National Sales Manager, Ensida Energy Alternative Fuel
Systems Shannon Sentell, Chief Operations Officer, Stealth Power
Emily Conway, Fleet Sustainability Manager, PepsiCo
Moderator: Ken Brown, Government Affairs Director, Transportation Energy Partners

10:00-10:15 **Networking Break**

10:15-11:15 **Decision Making Tools for Fleet Managers**
Wendy Dafoe, Senior Project Leader, National Renewable Energy Lab, U.S. Department of Energy
Tyler Herrmann, Co-Coordinator, Louisiana Clean Fuels
Nathan Washington, Government Sales Manager – West, GPS Insight
Moderator: Colleen Crowninshield, Clean Cities

11:15-12:00 **Show Me the Money**
Jason Wilcox, Physical Scientist, US EPA Transportation & Climate Division
Amanda Guthrie, Technical Specialist, Texas Commission on Environmental Quality
Ron Hieser, Program Coordinator, Texas Commission on Environmental Quality
Brian Denzel, Manager, HGACBuy
Moderator: Lori Clark, Coordinator, Dallas-Fort Worth Clean Cities

12:00-1:15 **Lunch with Special Guest Speaker (in Partnership with The Nature Conservancy)**
The First Carbon Neutral Airport in North America
Kris Russell, Environmental Program Manager, Dallas-Fort Worth International Airport

1:15-3:00 **View Vehicles and Talk to Vendors – Located in Grand Place Building (see event map)**
UPS, Electric Delivery Vehicle
Ensida Energy, Propane Powered Police Patrol Car – Dodge Charger
Rush Bus Center, Propane Powered School Bus
Stealth Power, Idle Reduction Technology in Tahoe Police Vehicle
UBCO, Electric Bike

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Welcome to EarthX Transportation!

EarthX

Transportation Energy Partners

Energy Independence Summit

Dallas-Fort Worth CLEAN CITIES

NAFA® Fleet Management Association

South Central Chapter

The Case for Electric School Buses

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Earth X Transportation Summit

4/226/2019

Stephen Russell

DOER / Massachusetts Clean Cities Coalition
Stephen.russell@Mass.gov

Department of Energy Resources and DOE Clean Cities Goals

- The Massachusetts Department of Energy Resources (DOER) is a state agency whose mandate includes the analysis and development of policies and programs to ensure that Massachusetts' transportation sector is aware of Alternative technologies and fuels available for vehicles today. To that end, DOER strives to create a clean energy future for the Commonwealth, economically and environmentally, including:
- Accelerating the deployment of clean alternative fuel vehicles.
- Increase the awareness of what technologies are available today
- Work with fleets in the electric vehicle sector.
- Develop pilot programs to support the integration of electric vehicles into the grid.(V2G)
- Reduce petroleum use in the transportation sector

To meet the above goals an electric school bus pilot was born

EV School Bus Pilot Goals

- Use electric school bus in regular school bus service
- Use electric school bus (battery) as energy storage
- Demonstrate revenue potential of Vehicle to Grid(V2G)
- Or Vehicle to Building (V2B)
- Advance the technology with education and awareness
- Reduce petroleum use in school bus operations

EV School Bus Pilot

Communities involved

- Mass DOER and Clean Cities Coalition issued a PON
- 3 schools responded:
  - Amherst
  - Concord
  - Cambridge

  - 2 communities served by Eversource Utility
  - 1 community served by a Municipal Light Plant (MLP)
  - Pilot began in 2015 with RFP from towns to procure buses and Elion bus from Canada was the only response to the RFP
  - Type C bus

EV school Bus video

https://youtu.be/mnvEhN47xJ0

What Have We Learned ?

- It is tough to be first…… Some advice…..
- Make sure infrastructure is in place before bus arrives
- RFP for bus should have service levels…
  - Where is parts depot, is a service tech available to trouble shoot
  - Calculate daily route miles so that battery and charging cycle meet the needs of the route
  - Be aware of demand rates by utility and make sure you have managed charging in either the Bus or charging station
  - Ask for an experienced EV drive ride along for a period of time when the buses first go into service
  - V2G was not quite ready for prime time

EV School Bus Pilot

Bus manufactured from the ground up

Charging Equipment

Level 1 charging
120V

Level 2 charging
208/240V

DC fast charging
480V

Bi-Directional Charging – Coming Soon

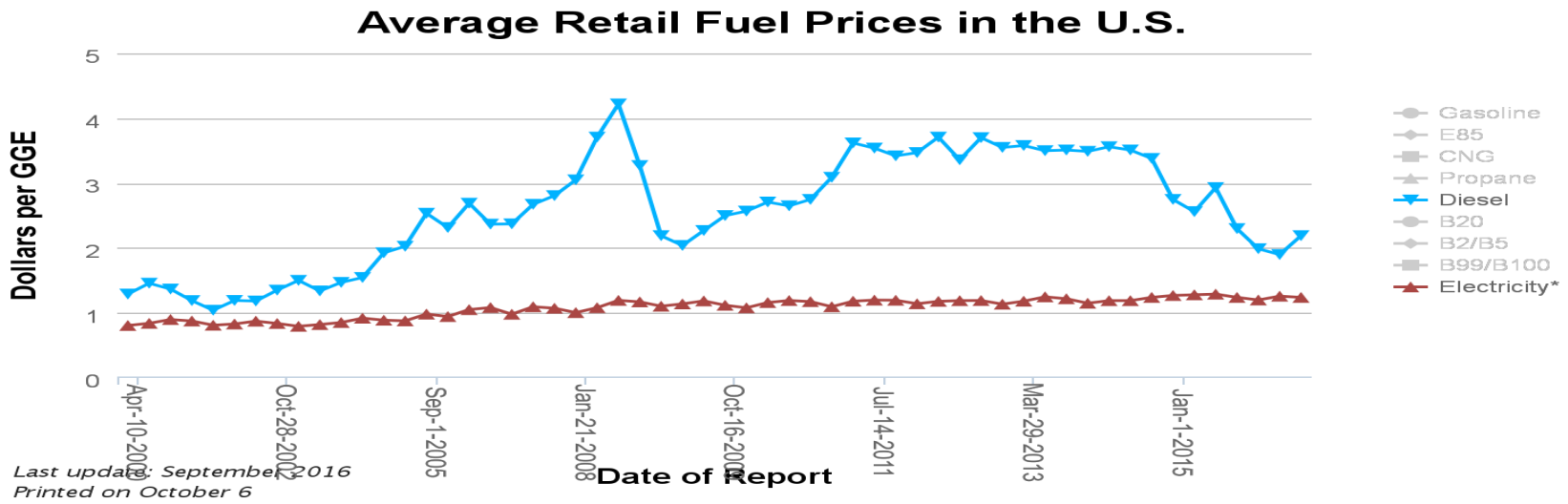
Vehicle to Grid (V2G) and Vehicle to Building (V2B)

- Managed charging
- Use battery storage to offset demand charges
- Charge battery with energy from renewables (solar or wind)
- Participate in energy markets

Contact EV SB Pilot

Stephen Russell
Clean Cities Coordinator
Stephen.Russell@mass.gov
617-626-7325 Final report link below

https://www.mass.gov/files/documents/2018/04/30/Mass%20DOER%20EV%20school%20bus%20pilot%20final%20report_.pdf



ROUSH CLEANTECH

EarthX Clean Transportation Workshop

"Sirens, Schools, and Shippers"

April 26, 2019
Briscoe Center At Fair Park, Dallas, TX

PROPANE SCHOOL BUSES

BLUE BIRD

ROUSH CLEANTECH

RUSH BUS CENTERS

BLUE BIRD

800.59.ROUSH

ROUSHcleantech.com

Propane Education & Research Council

- Authorized by the U.S. Congress.
- Funded by 5/10-cent per gallon assessment.
- Governed by 21-member industry board of directors.
  - 9 appointed by National Propane Gas Association.
  - 9 appointed by GPA Midstream.
  - 3 public members.
- 29 staff and 100+ Member Advisory Committee.


Agility
fuel solutions


ALKANE
TRUCK COMPANY


Alliance AutoGas
POWERED BY PROPANE


BLUE BIRD


C P
CAMPBELL - PARNELL


COLLINS
BUS CORPORATION


FREIGHTLINER
Custom Chassis
Driven By You


Greenkraft Inc
The Green Automotive Future


I


ICOM
NORTH AMERICA
Alternative Fuel Systems


ISUZU
Commercial Truck of America, Inc.


PSI
POWER SOLUTIONS
INTERNATIONAL


ROUSH
CLEANTECH


Thomas
BUILT BUSES
Because every mile matters.


Westport
Here and Now.


SCHOOL BUS

Jean

SANDY SPRINGS
FIRE-RESCUE

0
PROPANE


EMERGE
911




Powered by
Clean
Propane

ROUSH CLEANTECH

1980

- Diesel is a great fuel.
- Diesel engines last forever.
- No one cares about emissions.
- Propane buses are not available.

ROUSH CLEANTECH

2019

- Diesel is an endangered fuel.
- Diesel engines breakdown a lot.
- Everyone cares about emissions.
- Propane buses are available from all of the major OEMs.

Non-toxic and a non-contaminant of air, soil, and water resources.

ROUSH CLEANTECH

The Lowest Total Cost-of-Ownership

- Complete lifecycle analysis.
- 3 F's: Fuel, Filters, and Fluids.
- Maintenance and repairs.
- Labor and wages.
- Fuel handling and storage.
- Garages and facilities
- Refueling infrastructure.

ROUSH CLEANTECH

Everyday, propane buses transport over 1 million students across the U.S.

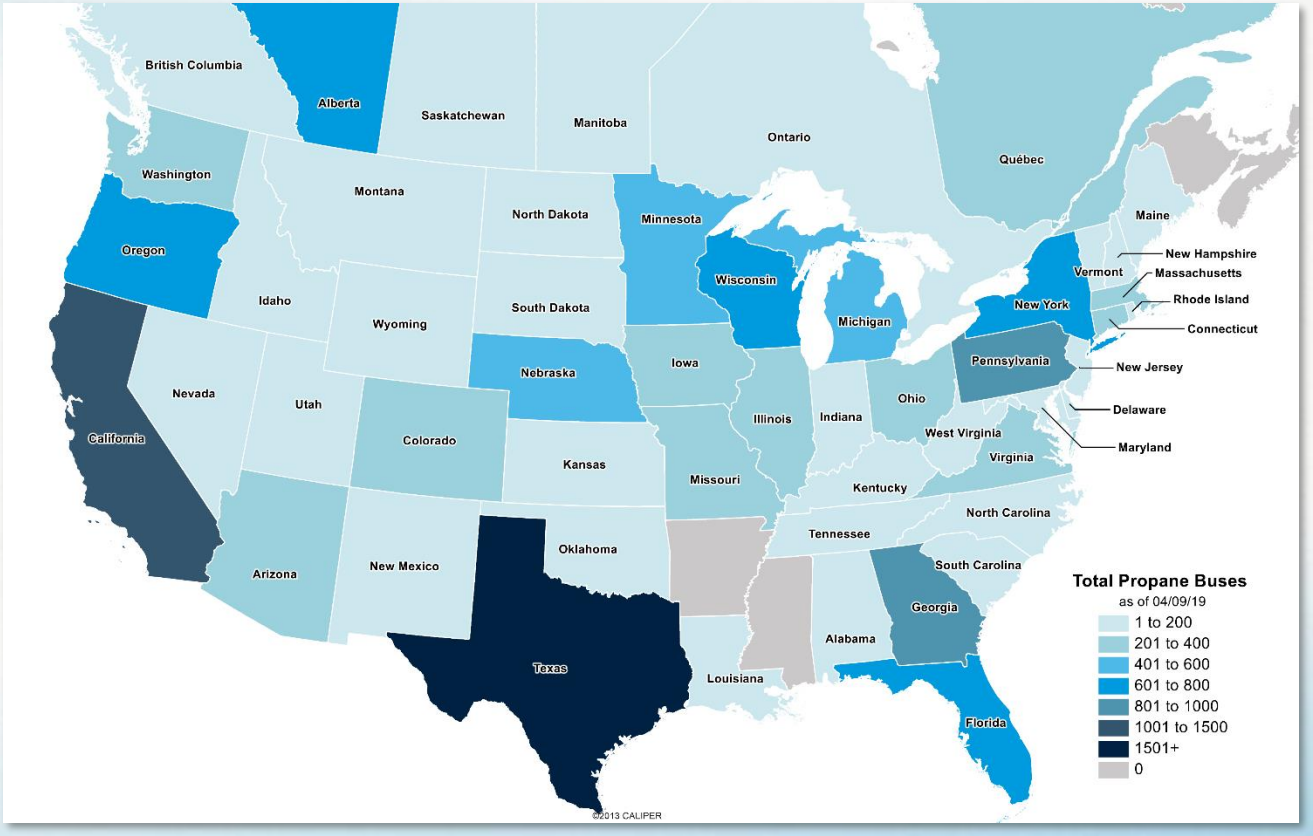
Approximately
15,600
propane school buses are on the route daily

Safely transporting approximately
1,000,000
students/day

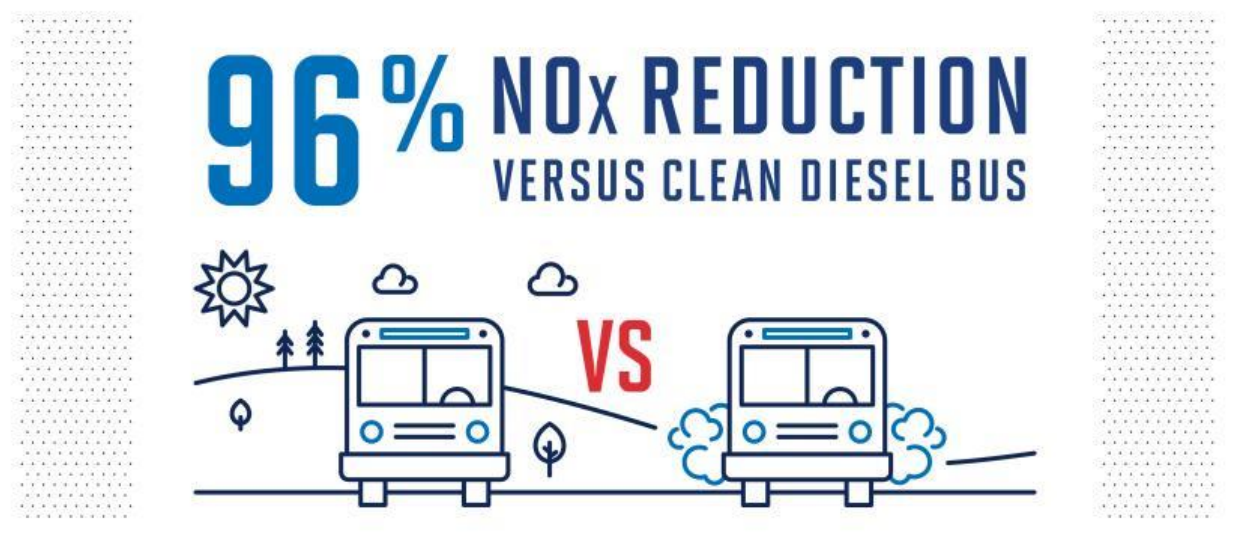
In the fleets of approximately
848
school districts, private schools, and bus contractors

ROUSH CLEANTECH

Propane Deployments



Emissions Reduction



Source: 2018 West Virginia University study, comparing 2015 LPG Blue Bird School bus (6.8L, 10 Cylinder) with 2014 ultra-low sulfur diesel Blue Bird school bus (6.7L 6 cylinder).

ROUSH CLEANTECH

Navigate Your Refueling Options

- Whether you have 10 fleet vehicles or 100, propane autogas has a refueling infrastructure option to fit your needs.
- Whichever setup you choose, you're sure to save money on total cost-of-ownership and keep your fleet efficient.

Call your infrastructure provider for more information about any of these options, and your local propane retailer for information regarding fuel.

PROPANE EDUCATION & RESEARCH COUNCIL


PROPANE
NO SMOKING
PROPANE VEHICLE FUEL
SUPERIOR ENERG
WWW.SUPERIO
POWER
PROPANE AUT


PROPANE
AUTOGAS
CLEAN AMERICAN ENERGY


NO SMOKING
PROPANE
SCHOOL BUS
STOP
SCHOOL BUS


PROPANE EDUCATION & RESEARCH COUNCIL

ROUSH CLEANTECH

Spark Ignited Offering

BLUE BIRD

ROUSH CLEANTECH

PROPANE

GAS

CNG

ROUSH CLEANTECH

Your Fuel Options

					
Ease of Adoption	✓	✓	✓		
Energy Independence			✓	✓	✓
NOx Emissions			✓	✓	✓
Fuel Infrastructure	✓	✓	✓		
Cost of Ownership			✓		
Range	✓	✓	✓		
Maintenance		✓	✓	✓	✓
Scalable	✓	✓	✓		
Cold Weather Operation		✓	✓		


Ford 6.8L V10
Major OEM High-Volume Production Engine

Ford Windsor Engine Plant

- Production:
  - Over 570 engines / day
  - Over 100,000 engines in 2017

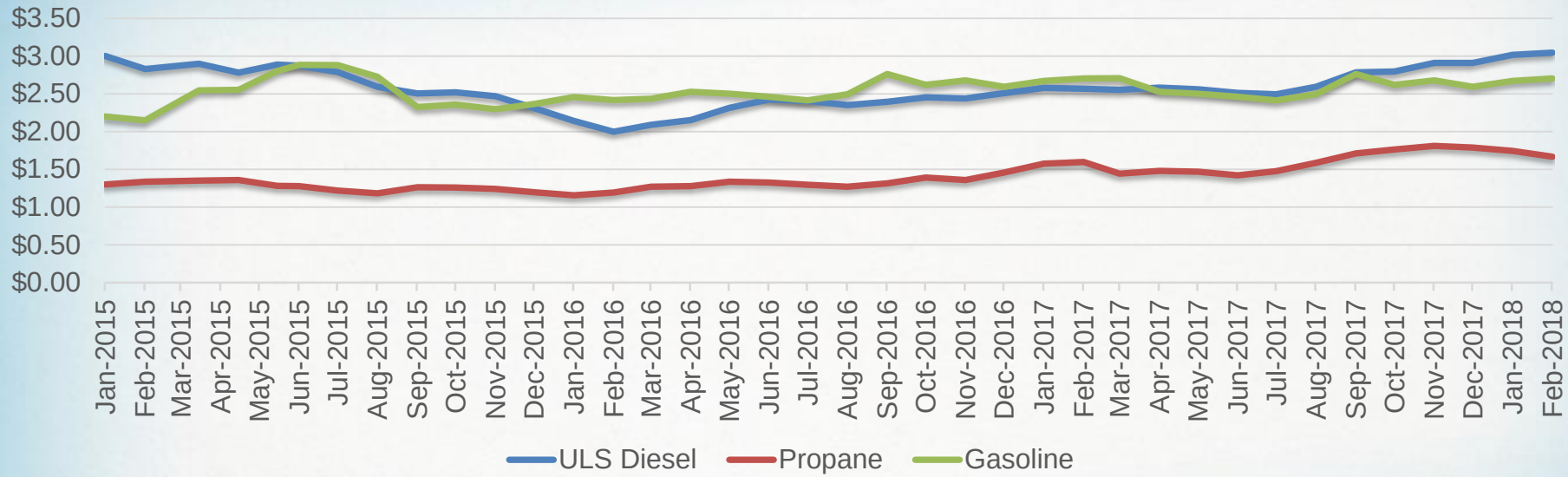
- Approx ~ 4.5% of Ford's entire 2018 6.8L V10 engine production will end up in a Blue Bird Vision school bus.

- High Volume Production Benefits:
  - Key in-process checks
  - Production quality
  - Data management / integrity / tracking
  - Improvement in process over time

Modern Diesel Technology

- Increasing complexity and cost
- Additional tooling and training
- Challenges with School Bus duty cycle

Fuel Component



- Propane has a stable price history
  - Recent surge in gasoline and diesel
- Price lock contracting for multiple years
- Eligible for rebates, bringing District dollars back

Preventative Maintenance

Ford V10
Propane
7 Quarts

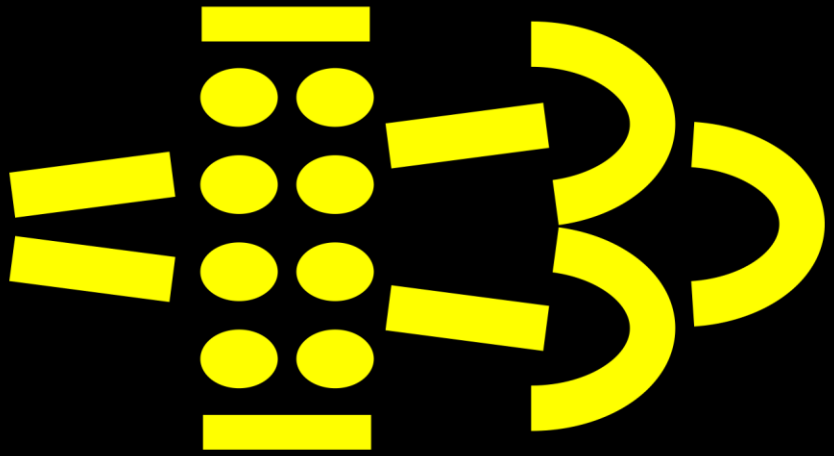
Various Engines
Diesel
17 – 30 Quarts

- Propane eliminates the need for DEF and the possibility of putting the wrong fluid in a tank

- Average diesel needs around 40 gallons / year

ROUSH CLEANTECH

The Diesel We Know Today



Benefits: Better Fueling

- Propane fuel transfers as fast as gasoline or diesel but with these added benefits:
  - Secured connection, no spillage
  - No diesel residual on pump handle
  - No residual on the ground
  - Non-carcinogenic

- Propane is non-toxic and dissipates into the atmosphere

Tank Protection & Crash Testing

- Followed CMVSS 301.1 protocol
- 4,000 lbs @ 40 MPH
- Angled side and rear impact
- 220 PSI tank pressure
- No leakage or no pressure drop in 30 minute test

ROUSH CLEANTECH

Real World Savings

"15 Cents per Mile Savings on Average"

CLEAR CREEK INDEPENDENT SCHOOL DISTRICT

"34 Cents per Mile Savings on Average"

CRESTWOOD

"Over $7,000 per Bus Savings in First Year"

UPPER MORELAND

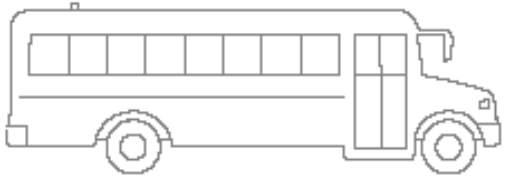
"80% Lower Fuel Costs"

COOK-ILLINOIS CORPORATION

ROUSH CLEANTECH

PROPANE BUS SNAPSHOT

TEXAS



WITH ITS **2,870** PROPANE BUSES, **TEXAS** ALREADY SAVES ON FLUIDS, FILTERS, FUEL, AND REPAIRS FOR A LOWER TOTAL COST-OF-OWNERSHIP.

7.5 MILLION

POUNDS OF NOx EMISSIONS A YEAR COULD BE REDUCED*

*By replacing the state's 21,964 diesel buses older than the model year 2007 with new propane buses.

Investing in more propane buses is an important step to saving more money and cutting harmful emissions in your community. Learn more about propane buses at **propaneschoolbuses.com**.

Similarly Equipped Blue Bird Type C Bus

Diesel, Cummins, ISB, 6.7L	$98,500.00
LPG, Ford/Roush, 6.8L	$107,000.00
CNG, Ford/Roush, 6.8L	$134,000.00
Electric, Adomani,	$375,000.00

Fuel Cost – Gallon Equivalent.
Diesel – Avg. 2.17
LPG – Avg. .78
CNG – Avg. .80
Electric - NA

ROUSH CLEANTECH

Some of the Local School Districts Operating Propane Buses:

Northside

Leander

Alvin

Clear Creek

Arlington

Ft. Worth

Prosper

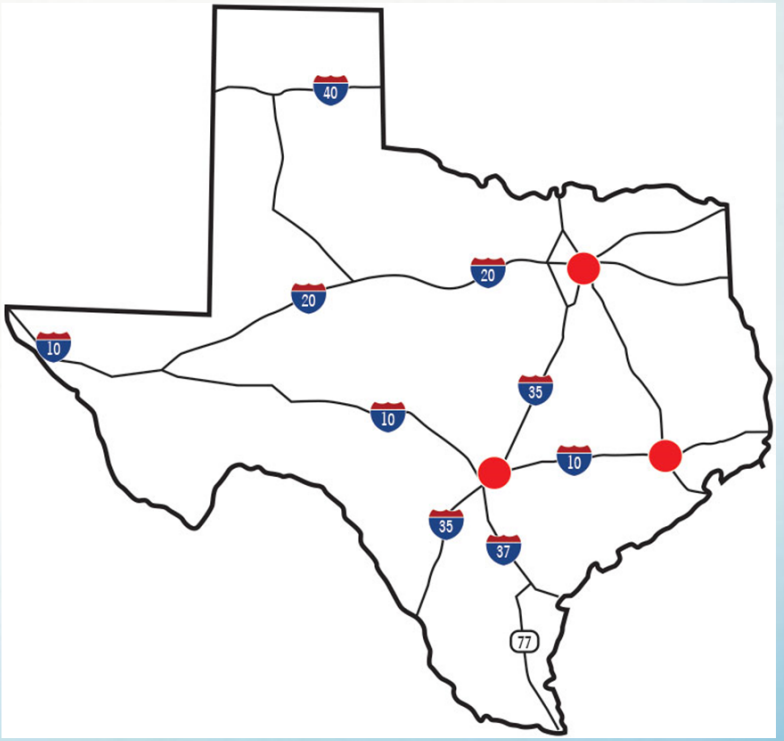
ROUSH CLEANTECH

Rush Bus Centers- Texas

Rush Bus Center- Dallas
4910 Transport Drive
Dallas, TX 75247
1-800-460-2877

Rush Bus Center- Selma (San Antonio)
16345 IH 35 North
Selma, TX 78154
1-877-578-4287

Rush Bus Center- Houston
8401 East Freeway
Houston, TX 77029
1-855-578-4287



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For more information contact:

Stephen Whaley, *Autogas Advisor*
Propane Education & Research Council
stephen.whaley@propane.com
864-923-5000

Robert Holt, *General Manager*
Rush Bus Centers
holtr@rushenterprises.com
210-800-8925

EPA's Diesel Emissions Reduction Act (DERA) School Bus Rebate Program

JASON WILCOX

U.S. ENVIRONMENTAL PROTECTION AGENCY

Health Impacts of Diesel School Buses

Why does EPA want to replace old diesel school buses?

- Diesel bus exhaust contains harmful Particulate Matter (PM), Nitrogen Oxides (NOx), and other pollutants
- Children are particularly vulnerable
  - Pollutants can be 2-5 times worse inside cabin than outside
- Link between PM/NOx and significant health problems:
  - Decreased lung function, aggravated asthma and other respiratory symptoms
  - Cancer, heart disease
  - Premature deaths, lost work and school days, and other health impacts

Health Impacts of Diesel School Buses

- Most 2007+ diesel engines are equipped with Diesel Particulate Filters (DPFs)
  - Can reduce Particulate Matter (PM) pollution by 90%

What About New Diesel Buses?

- Most 2010+ engines include Selective Catalytic Reduction (SCR) systems in addition to DPFs
  - SCRs can reduce NOx pollution by 90%
- How can you tell if you have an SCR system on your bus?

https://www.flickr.com/photos/drtran/2186120627

Health Impacts of School Buses

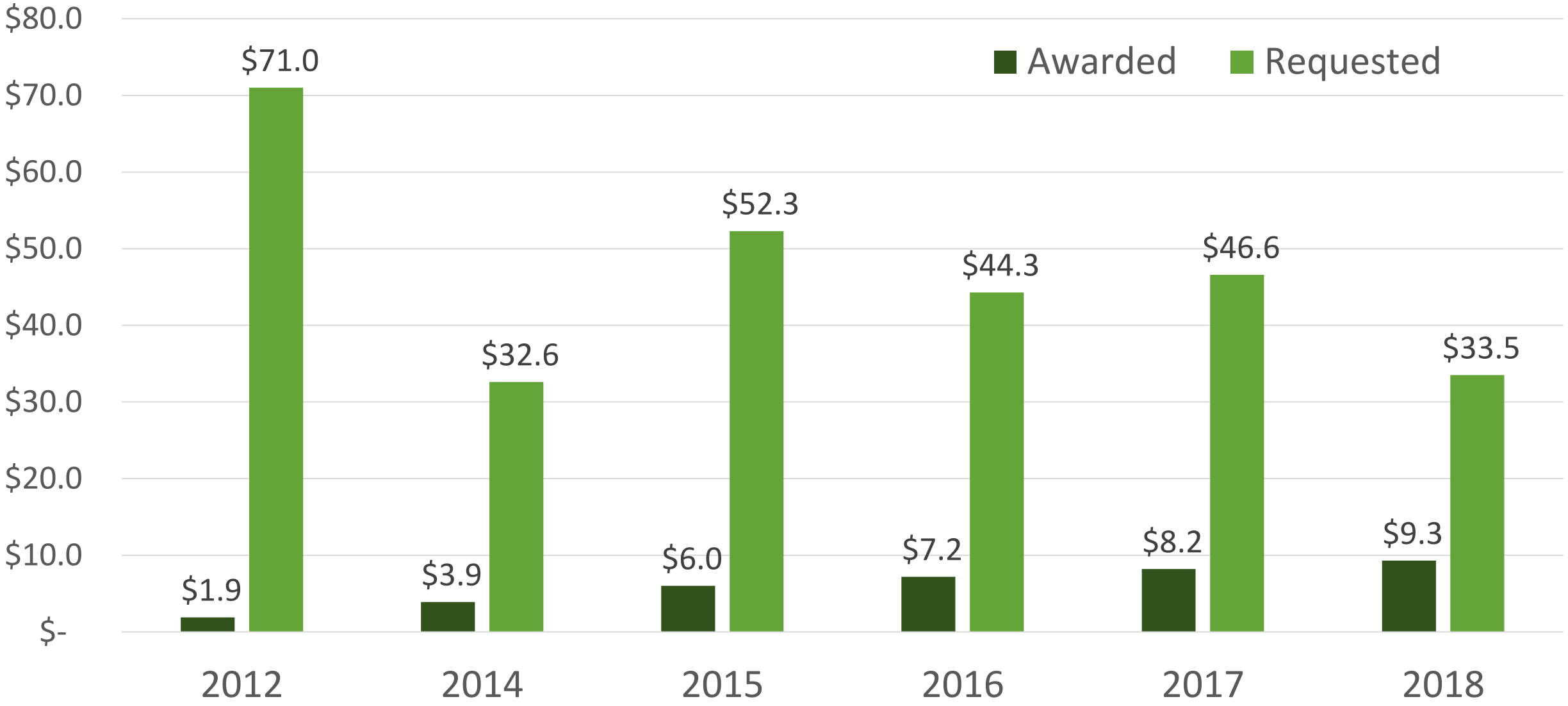
What about non-diesel buses?

- New gasoline buses are significantly cleaner than pre-2007 diesel engines
- Some new propane and CNG buses meet California's optional low-NOx engine standards which reduce NOx emissions by another 90% beyond EPA's heavy duty standards
- Electric buses have zero tailpipe emissions

DERA School Bus Rebate Program

- Simplified funding opportunity for replacement of old, dirty diesel school buses
- One year between application period and close-out
- Over $36 million awarded to date
- Nearly 2000 bus replacements funded

Rebate Funds Awarded and Requested in Millions



2019 Rebate Program*

- Anticipate awarding $10 million to fleets to scrap and replace old diesel school buses

Who is eligible to apply?

- Eligible applicants include preprimary, primary, or secondary public schools and private fleets under contract with public schools
- Applicants must own the buses being replaced (no leased buses)

*All 2019 rebate details in this presentation are based on the 2018 rebate program and are subject to change

2019 Rebate Program*

What old buses are eligible?

- Diesel-powered, Class 3-8 (Greater than 10,000 lb. GVWR)
- Powered by an engine with model year 2006 or older
- Transports 10 or more pre-primary, primary, or secondary school students to school or homes
- Operational and in regular use at the time of application
- Usage requirements:
  - Accumulated at least 10,000 miles transporting students over the most recent 12 months; or
  - Been in use for at least 3 days per week transporting students during the current school year
- Old bus must be scrapped before the rebate is issued

*All 2019 rebate details in this presentation are based on the 2018 rebate program and are subject to change

2019 Rebate Program*

What replacement buses are eligible?

- Must be equipped with a certified 2017 or newer model year engine
- New bus may be powered by diesel, gasoline, CNG, propane, battery electric, or other alternative fuels
- Must be operated in the same manner and over similar routes as the original bus
- Must be no more than one vehicle class larger than original bus
- Must be purchased, not leased or leased-to-own
- Must not be purchased with other federal funds or VW Trust funds from your state

*All 2019 rebate details in this presentation are based on the 2018 rebate program and are subject to change

2019 Rebate Program*

How much are the rebates?

Class	Gross Vehicle Weight Rating of Replacement Bus	Rebate Amount per bus
Class 3	10,001-14,000 lbs	$15,000
Class 4	14,001-16,000 lbs	$15,000
Class 5	16,001-19,500 lbs	$15,000
Class 6	**19,501-26,000 lbs**	**$20,000**
Class 7	**26,001-33,000 lbs**	**$20,000**
Class 8	**33,001+ lbs**	**$20,000**

*All 2019 rebate details in this presentation are based on the 2018 rebate program and are subject to change

2019 Rebate Application Process*

- Download application PDF from our website in and email signed application with scans of bus titles and registrations to CleanDieselRebate@epa.gov
  - www.epa.gov/CleanDiesel/clean-diesel-rebates
- Fleets with more than 100 school buses can submit up to 2 applications
- Fleets can request up to 10 replacements per application
- EPA will select rebate applications in a lottery
- At least one eligible applicant will be selected for funding from each state/territory in the applicant pool

*All 2019 rebate details in this presentation are based on the 2018 rebate program and are subject to change

Estimated 2019 Rebate Program Timeline*

October 2019	Application period
January 2020	EPA posts selectees and waiting list online and emails official selection letters to selectees
April 2020	Deadline for submitting copies of purchase orders for replacement buses to EPA
September 2020	Deadline for fleets to submit proof of receipt of new buses and scrappage of old buses.

*All 2019 rebate details in this presentation are based on the 2018 rebate program and are subject to change

Questions?

- EPA DERA Homepage: www.epa.gov/CleanDiesel
- For questions on DERA funding, contact our helpline at CleanDiesel@epa.gov or reach out to me at Wilcox.Jason@epa.gov
- For info on other DERA funding opportunities, join the “Show Me the Money” session at 11:15am

Thanks for your efforts to clean up our old diesel school buses!

Texas Volkswagen Environmental Mitigation Program (TxVEMP)

Projects to Replace or Repower School Buses

Contact

- Visit www.TexasVWFund.org to view and download copies of the Mitigation Plan and application.
- Sign up for our email updates on our website.
- For information, call TCEQ's, TxVEMP staff at (833) 215-TXVM (8989).

AFVs for Healthy Neighborhoods

Clean Cities Success: Rio Rico Fire District

https://youtu.be/6sCTWS4pSL8

In 2007 RRMFD joined forces with Hans Huth, from ADEQ. There was an issue with a lot of waste cooking oil being poured out in the desert across the border in Mexico and it would eventually end up in the Santa Cruz river (which flows north) and cause problems with the water treatment plant in Santa Cruz county. A grant was given to RRMFD, University of Arizona, ADEQ, Bomberos Nogales, and ITN University in Nogales, Sonora. Two identical bio diesel processing plants were built, 1 at a Rio Rico Fire station and 1 at a University in Nogales Sonora.

It was going good until the $$ ran out

We partnered with our community asking them to not throw away used vegetable oil that would end up at the landfill, but rather to drop it off at our fire stations.

We were amazed at the communities response to our request. From 16oz repurposed water bottles filled with used oil, to 5 gallon containers the community started dropping off oil.

We were soon delighted to have a used oil storage problem!

Oil is moved from storage tanks

Into modified water heaters

Not just fighting fires and saving lives, we make bio diesel, to save money and the air we breath.

Then it goes into settling tanks

We sold off gas vehicles and purchased used diesel vehicles

And new B20 Ambulance's

30,000 Reasons we committed to a bio diesel program with a 20% savings on fuel cost.

We are giving away extra oil to others in need of waste vegetable oil for their private or fleet use and our relationship with the people of Santa Cruz County Arizona is something we are really proud of. Over 300+ gallons donated each month by our community plus our restaurant donors.

We are driving 30,000 pound fire trucks through the neighborhood with vehicles that are greatly reducing the amount of Carbon Monoxide, Hydro Carbons and Particulate Matters

It works! Our relationship with our neighbors is second to none!

POWERED BY BIODIESEL

RIO RICO MEDICAL & FIRE

INTER-AGENCY COOPERATION
FOR PROPANE INFRASTRUCTURE

LAKE WALES CHARTER SCHOOLS

POLK COUNTY PUBLIC SCHOOLS
STUDENTS FIRST

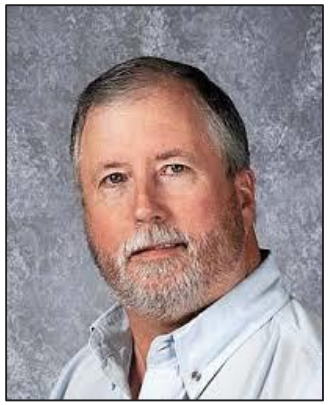
SHERIFF'S OFFICE
POLK COUNTY
FLORIDA
IN GOD WE TRUST

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

Ferrellgas

ENSIDA ENERGY
ALTERNATIVE FUEL SYSTEMS

Francis Hart, Jr. – Fleet Administrator



- Native of Polk County, Florida
- Hired as a Polk County deputy at age 21 in 1977
- Special Investigations as Undercover Narcotics Agent
- Promoted to Sergeant in 1983, Captain in 1988, and Major in 1996
- Commanded Special Operations Division for over 10 years
- 2007 - Retired from PCSO
- 2008 - Returned to PCSO as Fleet Administrator of 1,400 units
- 2010 - Began the Propane Auto Gas program

Among the specialty units he has overseen Aviation, Marine, Environmental, Agricultural, Animal Control, SWAT Team, Crisis Negotiation Team, Underwater Search and Recovery Team and currently Fleet Services.

In 2005 Major Francis Hart led dozens of Sheriff's deputies, police officers, EMT's, and fire fighters to assist the hurricane Katrina relief effort in Mississippi; which at 28 days was the longest and largest deployment Polk County has ever had.

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

SHERIFF GRADY JUDD

POLK COUNTY SHERIFF'S OFFICE

Integrity ★ Compassion ★ Accountability ★ Professionalism

★★★★★★★★★★

"TEN STAR ACCREDITED AGENCY"

Grady Judd began his career at the Polk County Sheriff 's Office in 1972 as a dispatcher. After transferring to the Patrol Division in 1974, he quickly progressed through the ranks – holding every rank from Sergeant to Colonel. Polk County overwhelmingly elected Grady to serve as Sheriff in 2004. He was subsequently re-elected in 2008, 2012 and 2016.

As of March 2017, the Polk County Sheriff's Office is the **only** law enforcement agency, out of 17,985 nationwide, that has been awarded three Accreditation with Excellence awards by the Commission on Accreditation for Law Enforcement Agencies, Inc. (CALEA) for Law Enforcement, Public Safety Communications, and for Polk State College's Public Safety Training Academy.

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

PCSO FLEET INFO

- Fleet Size: 1,400 pieces of equipment
- 750 are pursuit vehicles
- 200 Bi-Fuel LPG units
  - 2009-2011 3.9L EFI IMPALA'S
  - 2012 2016 3.6L DI IMPALA'S
  - 2017-2019 3.6L EFI CHARGER
- 1+ Million miles driven monthly
- Approx. 90-100,000 gallons of fuel used monthly
- Approx. 15,000 gallons of LPG used monthly
- 10 full-time and 2 part-time Technicians
- Technicians are Alt-Fuel Certified

- FIRST USE OF LPG FUEL - 1979 – PURSUIT CHEVY NOVA (Didn't go well.)

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

ALT-FUEL Considerations for Law Enforcement Vehicles

1. Which fuel to choose: **LPG vs CNG**
2. EPA Certifications Available
3. Equipment & Maintenance Cost **$$$**
4. Fueling Infrastructure Cost & Locations
5. Fuel Data Interface
6. Dedicated vs Bi-Fuel Systems
7. Equipment & Installation Vendor (Warranty Support)
8. Fuel Vendor Selection (Can they handle the whole fuel system or just fuel?)
9. Operator Education (Over-coming myths from TV & Movies)
10. Fuel Sites (Locations must be Convenient)
11. Fuel Quality & Filters

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

Why did Polk County choose PROPANE?

1. **Lower Costs:**
   a. Fueling Infrastructure (Location & Cost)
   b. Vehicle Fuel Systems (Bi-Fuel)
   c. Propane is typically $1.00 or more less per Gallon of Gasoline Equivalent
   d. Fast fill capability similar to gasoline pumps
   e. Emergency fuel support (Portable Fuel Sites & Bobtail Support)

2. **Safety:**
   a. Propane fuel tank pressure is approximately **165 psi vs 3,600 psi for CNG**
   b. Propane fuel tanks are made from chromoly steel
   c. Propane ignites at approximately **920 degrees** Fahrenheit
   d. No shop upgrades for doing maintenance

3. **Environmental Stewardship**
   a. Euro fill valves allow a very small amount of Propane into atmosphere
   b. Tail-pipe emissions are dramatically reduced compared to gasoline
   c. Less oil changes due to little carbon getting into engine.

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

How did Polk County choose a PROPANE supplier?

Considerations: Want a 1 stop shop!

1. Suppliers can be National, Regional, or Local
2. Contract Terms (Billing by consumption vs delivery)
3. Infrastructure Support
4. Integration of fuel data into fleet management systems
5. Emergency fuel availability
6. Pre-Pay Terms
7. Local Corp Control of Auto-Gas program

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

Inter-Agency Cooperation for PROPANE Infrastructure

- At **2,010** square miles, Polk County is the 4th largest in Florida

- Polk County is Larger than the State of Delaware

- Range is a major consideration

- Currently 200+ Bi-Fuel Law Enforcement Units

- Both the County and Lake Wales Charter Schools have added Dedicated LPG Buses to their Fleet - Approx. 34 units.

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

Inter-Agency Cooperation for PROPANE Infrastructure

- Joint Fuel Sites bring an Economy of scale to the operation

- Currently have 7 Fuel Master controlled fuel sites
  - 2 Located at County School Bus Maintenance Barns
  - 3 Located at Sheriff District Commands
  - 1 Located at Sheriff's Fleet
  - 1 Located at County Maintenance Barn

- All operators can fuel at any site and receive Separate Billing.

PROPANE AUTOGAS
CLEAN AMERICAN ENERGY

R.O.I.

VEHICLE RANGE from EPA Lab Dyno Results			
	Useable Gallons	MPG	Range In Miles
LPG	22	22.42	493.24
Gasoline	16	23.00	368.00
		TOTAL RANGE:	861.24

RETURN ON INVESTMENT: $4,680/YEAR

Assumptions:

1. Daily Fuel Consumption = 15 gallons
2. Average difference between Gasoline and LPG = $1.20/gallon
3. 15 gallons x $1.20/gallon = $18.00 savings per day
4. $18.00 savings per day x 5 days = $90.00 savings per week
5. $90.00 savings per week x 52 weeks = $4,680.00 savings per year

FUEL ECONOMY from EPA Certified Test Lab	
Test # T-434	
EPA FTP 75/Hwy Gasoline Consumption	23.00 mpg
ENSIDA EPA FTP 75/Hwy LPG Consumption	23.61 mpg
ENSIDA with -5% gasoline at start and strategy contributions	22.42 mpg

EMISSIONS from EPA Certified Test Lab			
TEST # T-434	EPA Maximum Allowable Limits	Ensida Energy Test Results	Difference
NMOG(NMHC)	0.0550	0.0175	68% Lower
CO	1.7350	0.3644	79% Lower
Nox	0.0220	0.0060	70% Lower
HC	0.0110	0.0070	36% Lower

Bob Gerber
Director- National Sales
C: 561-627-2553
E: Bob@EnsidaEnergy.com

STEALTH POWER

Smart Power Systems

with Idle Reduction Capability

Shannon Sentell

CHIEF OPERATIONS OFFICER

Shannon Sentell is the Chief Operations Officer for Stealth Power – the global leader in mobile power and idle-reduction technology. Prior to joining Stealth Power, Sentell was Director of the Physics Program at the United States Military Academy at West Point, NY where he retired after 24 years of service as an Army officer. Sentell holds a Doctorate in Nuclear Engineering from the University of South Carolina and has graduate degrees from the Massachusetts Institution of Technology and the Fletcher School of Law and Diplomacy at Tufts University

In Brief...

Smart Power Systems

MOBILE IDLE REDUCTION

Full mobile power – without engine engagement – for vehicles with demanding electrical needs. Our smart electric-power systems provide energy to all onboard equipment while reducing idling.

REMOTE HYBRID POWER

Our hybrid systems provide safe, scalable power for remote applications, such as oil & gas, mining, irrigation, cell towers, watch towers, operating bases, and electrical grids for remote areas.

Vehicular Industry Applications

THE STEALTH POWER SYSTEM FITS ANY VEHICLE, ANY FLEET SIZE. FROM 1 KWH TO 60 KWH.

Law Enforcement

Fire/ EMS

Military

Service Vehicles

Communications

Oil &Gas

School Buses

Utility

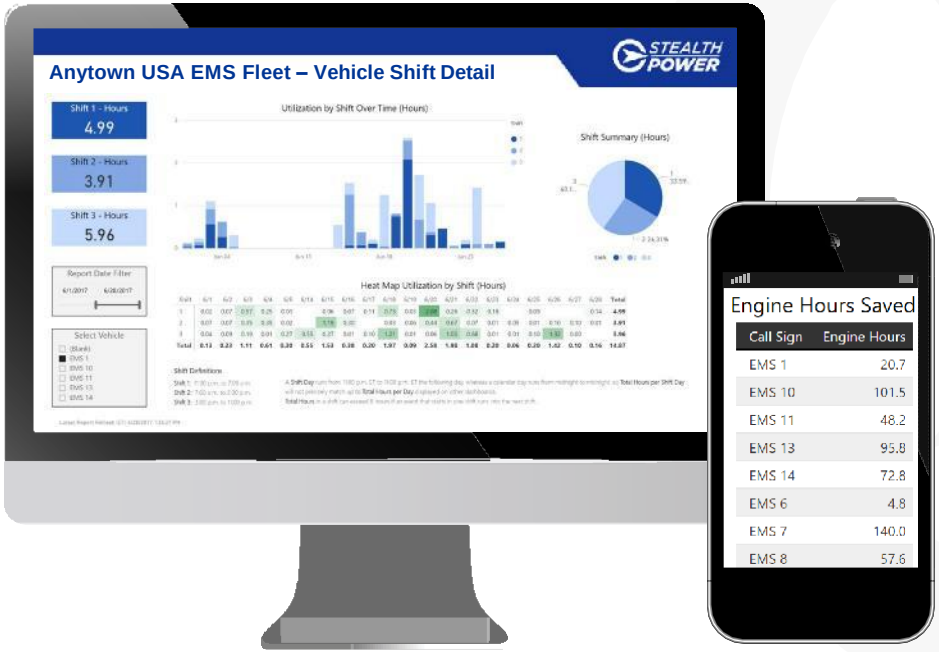
Operational Benefits

Our smart mobile power systems offer:

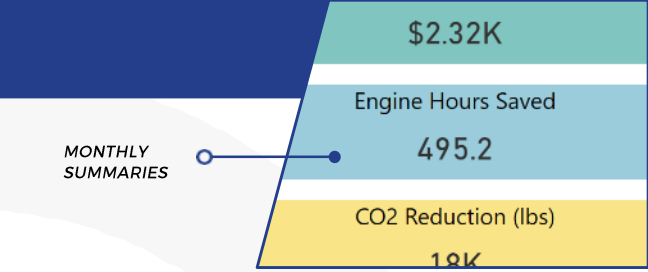
- Autonomous start/stop feature
- Remote diagnostics
- Reduced emissions
- Better work environment – no noise, no vibration, no fumes
- Reduced fuel usage and maintenance cost savings
- Emergency vehicle jump charge feature

Stealth Power Data Powered By Microsoft

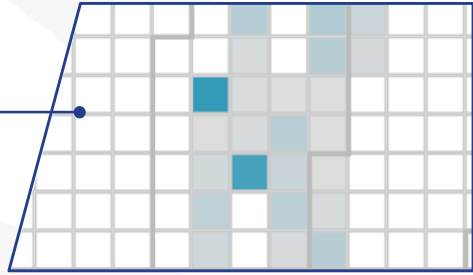
Our client dashboard utilizes real-time data to enhance fleet operation and maintenance.



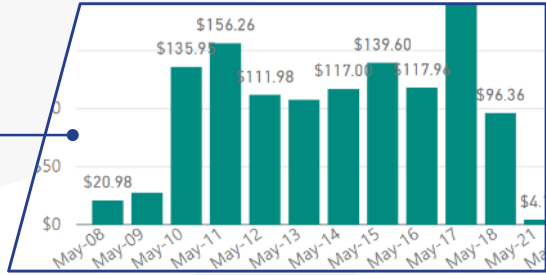
MONTHLY SUMMARIES



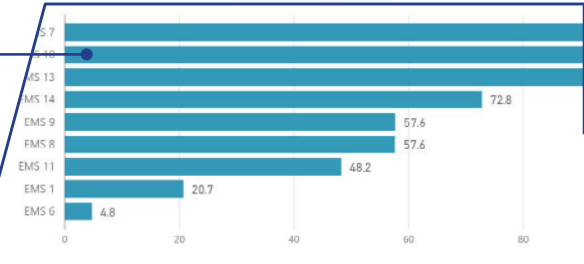
HEATMAP VIEWS



FUELSAVINGS BY MONTH

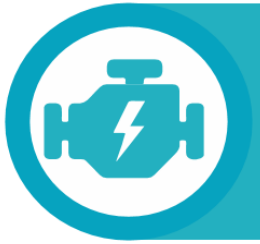


ENGINE HOURS SAVINGS BY VEHICLE



Real-Time OBD Fault Logging

Real-time remote data capture



Service alerts (ie. Oil lighting, check engine lighting, etc.) -Translate the actual faults into codes

Intermittent faults-capture

Green Power Solutions

Cut costs while reducing your environmental impact

REDUCE HARMFUL EMISSIONS

Significantly reduces CO2, NOx, and Greenhous Gas Emissions

- Automatic vehicular idle reduction
- Improves working conditions
- Limits exposure to noise pollution
- Limits the use of remote, full-time generators

CLEAN POWER

Provides cleaner and more reliable power than diesel/gas

- Lithium ion batteries
- Vehicular solutions offer HVAC options
- Large, scalable hybrid solutions
- Optional solar integration on all systems

Shannon Sentell

COO

SSentell@stealthpower.net

T: 803.587.5550

F: 512.617.7904

STEALTH POWER

www.stealthpower.net

PEPSICO

WE ARE BETTER TOGETHER

PepsiCo Fleet Sustainability

April 2019

PepsiCo Food and Beverages Fleet
- One of the Largest Private Fleets in North America

11,100
TRACTORS

3,500
STRAIGHT TRUCKS

8,300
SERVICE/SUPPORT VEHICLES

17,500
TRAILERS

70,000+ Assets

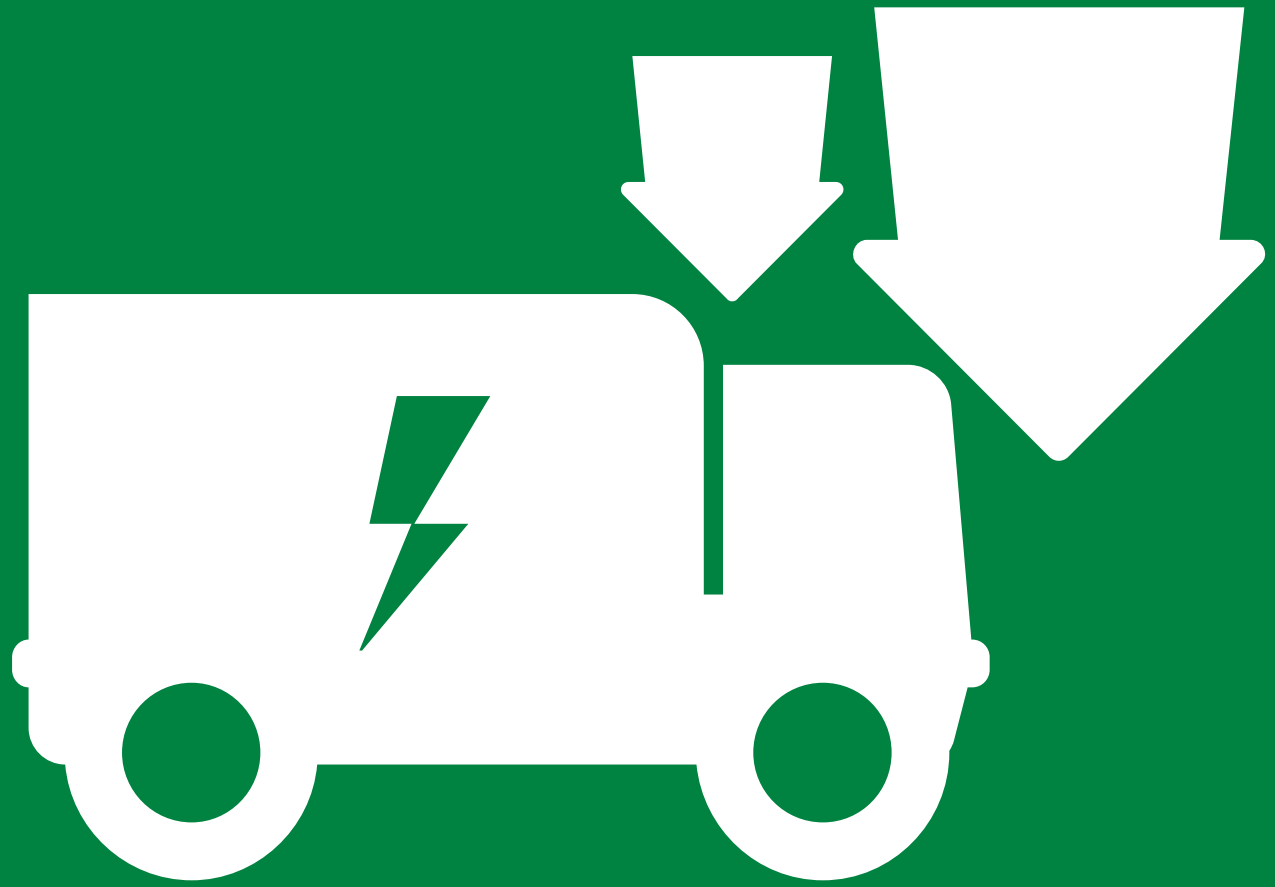
12,300
VANS

350
YARD TRACTORS

4,200
COMPANY CARS

14,500
MATERIAL HANDLING

PepsiCo is Winning with Purpose with Company-Wide GHG Reduction Goal



REDUCE ABSOLUTE GREEN HOUSE GAS EMISSIONS ACROSS OUR VALUE CHAIN BY

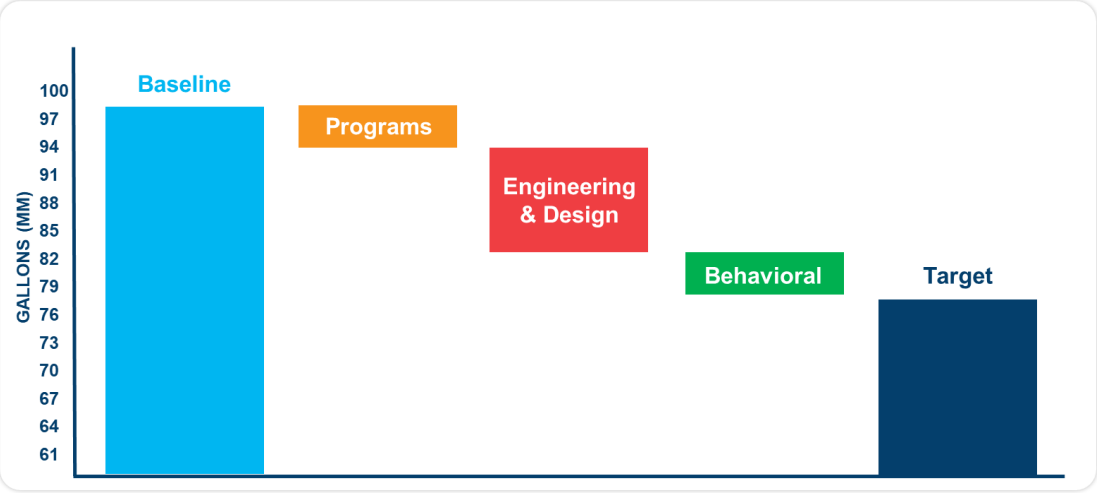
20%

PEPSICO | WE ARE BETTER TOGETHER

PepsiCo Established Holistic Fleet GHG Reduction Strategies

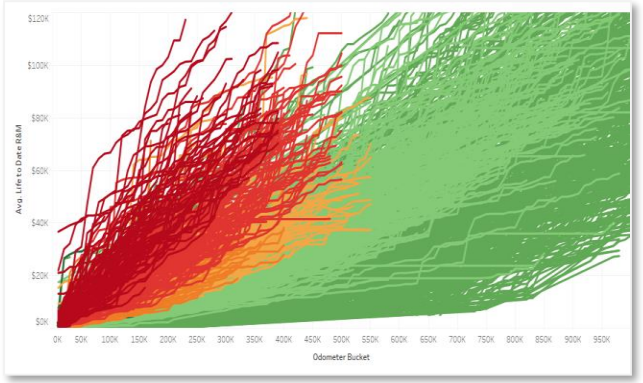
Strategy for achieving reductions:

- Programs – Do we need to operate that mile on that type of equipment?
- Engineering & Design
- Behaviors - Conservation



Tactics for achieving reductions:

- Extensive Data/Quantitative Analytics



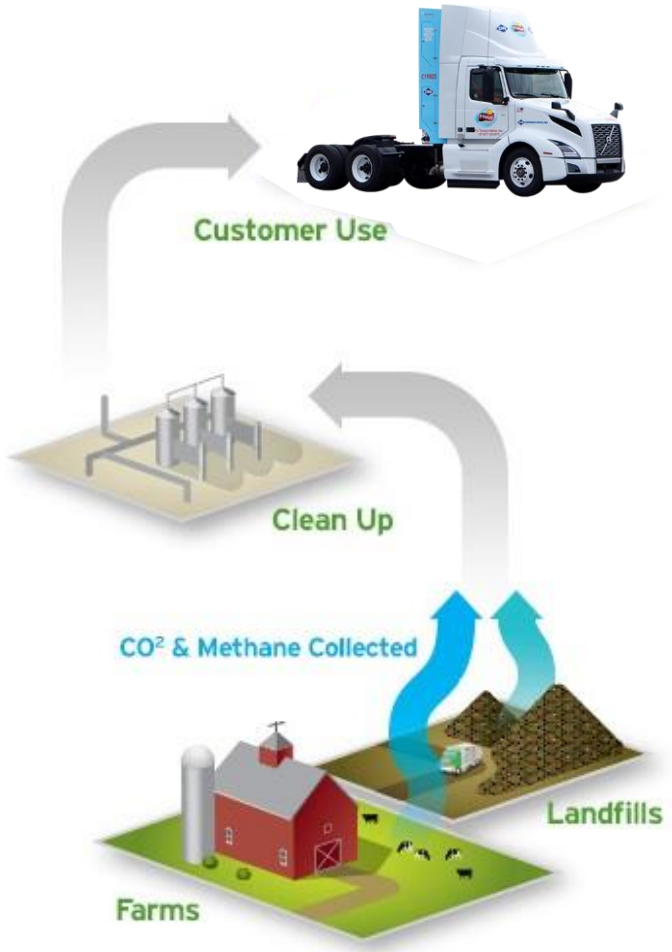
- Targeted Investment
- TCO
  - Right vehicle Right route
  - Acquisition/Leasing/Depreciation Cost
  - Repair and Maintenance Cost
  - Fuel Energy Costs
- WwP Capital Programs – GHG impact/$ invested

Leveraging Experience in Fleet Sustainability

Alternative Fuel Fleet

Hybrid 	Hybrid 	CNG 
Propane 	Electric 	Electric 

Renewable Natural Gas



Emerging Initiatives:

- Electrification
- Zero and Near-Zero Emission Freight Facility

PEPSICO | WE ARE BETTER TOGETHER

Transformative Solutions for Product Distribution

- California grant program drives transformative, cost-effective, clean & innovative technologies
- In partnership with the San Joaquin Valley Air Pollution Control District, Frito-Lay's vision is to transform the Modesto plant into a near-zero emissions freight facility
- Scope includes:
  - Solar panel array with battery storage
  - Employee EV charging
  - Electric yard tractors, box trucks, and tractors
  - Charging infrastructure with battery storage
  - Low NO_X renewable CNG tractors and fueling
  - Li-ion powered forklifts
- Other partners include: Tesla, Peterbilt, Meritor, BYD, American Natural Gas, Volvo

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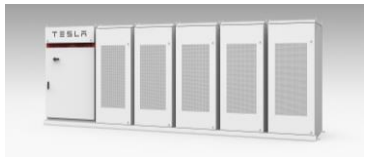
663 KWH
ENERGY STORAGE
FOR FACILITY & LD EVSE
BATTERY
ELECTRIC FORKLIFTS
PUBLIC ACCESS
RNG FUEL
STATION
SOLAR PV CARPORT
& LDV EVSE
NEW ELECTRICAL SERVICE
& 1690 KWH ENERGY STORAGE
FOR HD EVSE
HEAVY-DUTY ZE/NZE
TRUCK PARKING & EVSE

Accelerated Deployment of Advanced Technologies



- Late 2018 to Mid 2019
  - Grant Award, Contract Completion, Start CNG and Electric Infrastructure Projects, Test Electric Box Truck
- Mid 2019 through 2020
  - Infrastructure Components Complete, Vehicle Deployment
- First Quarter 2021
  - Project Completion, Final Report, Inaugural Event

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8

Questions

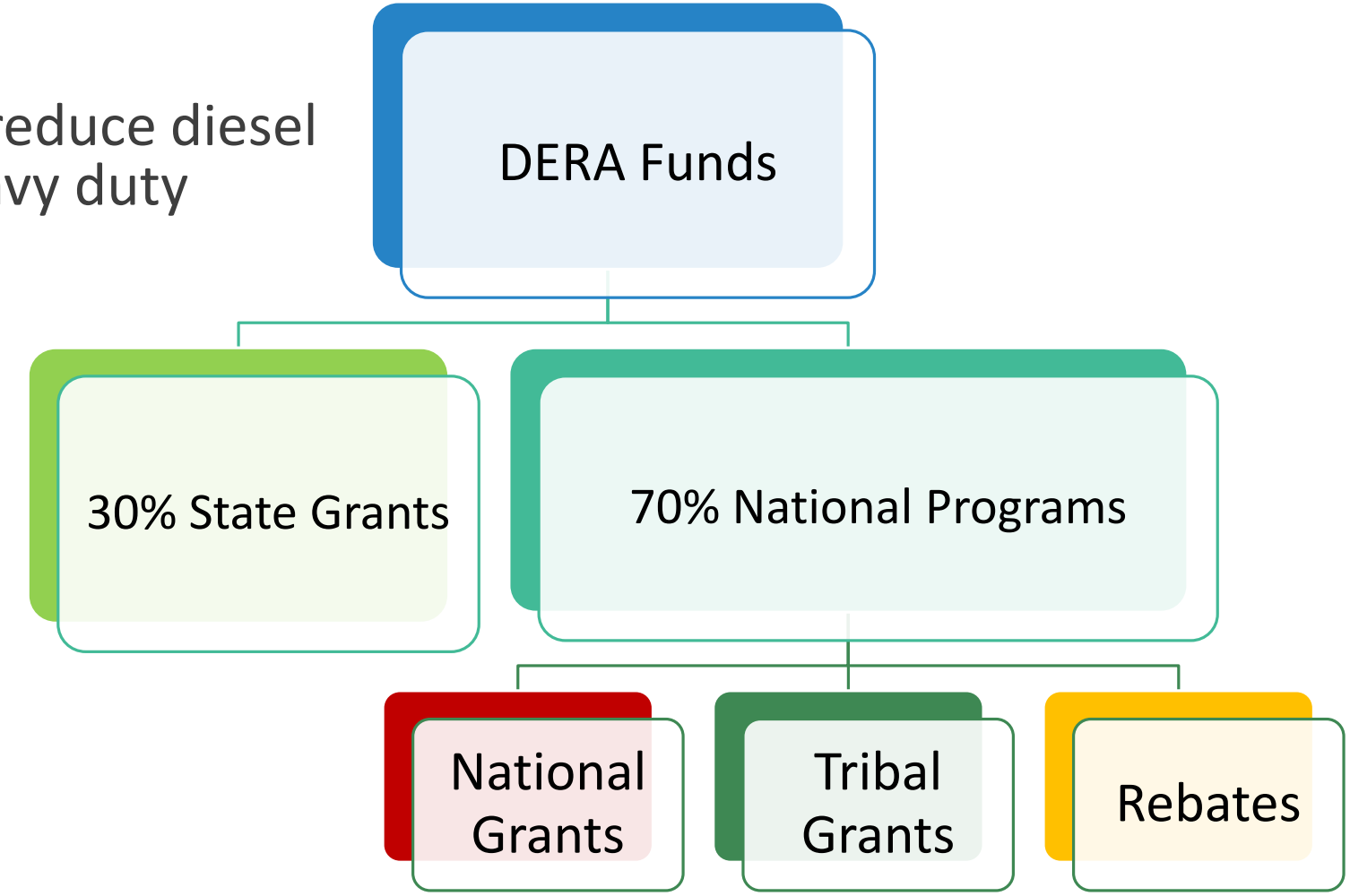
EPA's Diesel Emissions Reduction Act (DERA) Funding Opportunities

JASON WILCOX

U.S. ENVIRONMENTAL PROTECTION AGENCY

DERA Overview

- Grant and rebate programs to reduce diesel emissions from nonroad or heavy duty highway vehicles
- 3 annual grant programs:
  - State
  - National
  - Tribal
- School Bus Rebate Program
- Total funding:
  - FY 2018: $73 million
  - FY 2019: $84 million



Health Impacts of Diesel Engines

Why does EPA want to clean up old diesel engines?

- Diesel exhaust contains harmful Particulate Matter (PM), Nitrogen Oxides (NOx), and other pollutants
- Link between PM/NOx and significant health problems:
  - Decreased lung function, aggravated asthma and other respiratory symptoms
  - Cancer, heart disease
  - Premature deaths, lost work and school days, and other health impacts

Eligible Vehicles and Projects for DERA Grants

Vehicles, equipment, engines:

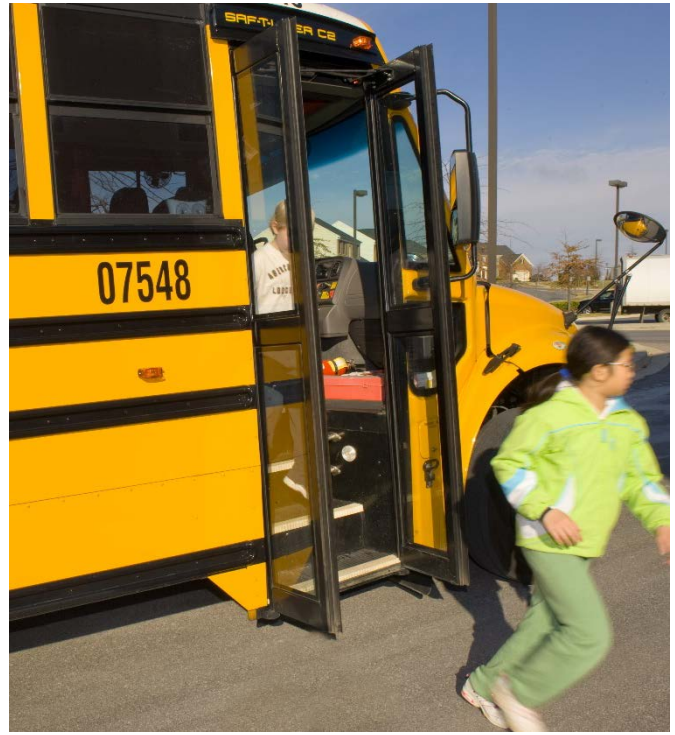
- Buses
- Class 5 – Class 8 heavy-duty highway vehicles
- Marine vessels
- Locomotives
- Nonroad equipment used in:
  - Construction, cargo handling, agriculture, mining, or energy production

Projects:

- Exhaust retrofits
- Idle reduction technologies
- Engine replacements
- Vehicle replacements
- Truck stop electrification
- Marine or locomotive shorepower
- And more!

DERA School Bus Rebate Program

- Simple alternative to grant funding opportunities
  - Easy application process
  - ~1 year from application to close-out
  - Lottery selection process
- Public fleets and private fleets serving public schools are eligible to apply
- EPA offers $15,000-$20,000 for scrapping and replacing old school buses
- Nearly 2000 bus replacements funded to date
- 2019 Application period to open in October



DERA Tribal Grant Program

- Competitive grant program offered to federally recognized Indian tribal governments
- Most recent competition closed April 3rd
  - ~$4 million to be awarded
- Tribes can use VW Environmental Mitigation Trust Funds via the DERA Option

DERA National Grant Program

- Largest funding opportunity in DERA
  - Anticipate awarding $40 million in recently closed FY 2019 opportunity
- Eligible applicants:
  - Regional, state, local, tribal, or port agency with jurisdiction over transportation or air quality
  - Non-profits that:
    - represent or provides pollution reduction or educational services to persons or organizations that own or operate diesel fleets; or
    - have, as their principal purpose, the promotion of transportation or air quality.
- Competition prioritizes areas of poor air quality and goods movement facilities

DERA State Grant Program

- 30% of total DERA funds offered to states and territories
  - 2/3 of state grant funds offered as a base funding level
  - 1/3 offered as a bonus for states that match EPA funds dollar-for-dollar
    - Bonus = 50% of base amount
- Non-competitive
- States that match EPA funds dollar-for-dollar get 50% more
- States and territories can use VW Environmental Mitigation Trust Funds via the DERA Option

Volkswagen Environmental Mitigation Trust Fund "DERA Option"

- States and tribes can expand the scope of their DERA State and Tribal grants using VW Trust Funds via the "DERA Option"
- VW Trust Funds can only cover the "voluntary" cost-share in DERA projects
  - VW Trust Funds cannot cover the "mandatory" cost-share in DERA Projects

More Information

- EPA DERA homepage: www.epa.gov/CleanDiesel
  - We expect to post FY 2020 funding opportunity details on the website late this year
- For questions on DERA funding, contact our helpline at CleanDiesel@epa.gov or reach out to me at Wilcox.Jason@epa.gov

Thanks for your interest in reducing harmful diesel emissions!

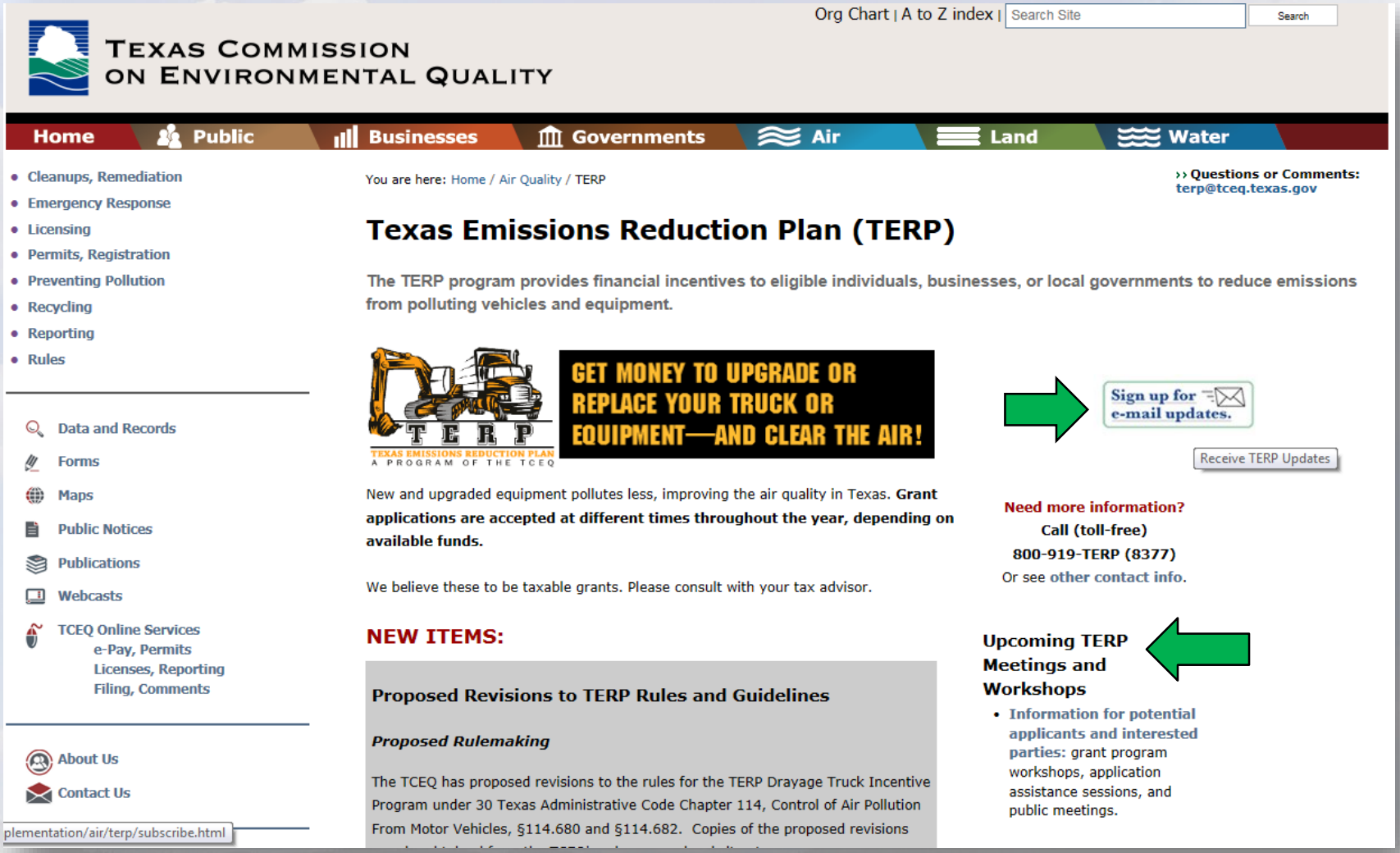
Funding Opportunities

Texas Emissions Reduction Plan (TERP)

and

Texas Volkswagen Mitigation Program (TxVEMP)

Sign-up for Updates!



Contact

- Visit www.TexasVWFund.org to view and download copies of the plan
- Questions may be submitted to vwsettle@tceq.Texas.gov
- For information, call TCEQ's TxVEMP staff at (833) 215-TXVM (8989)
- Visit www.terpgrants.org to access TCEQ's TERP programs

HGACBuy™
THE SMART PURCHASING SOLUTION

THE SMART PURCHASING SOLUTION

A GOVERNMENT-TO-GOVERNMENT NATIONWIDE COOPERATIVE PURCHASING PROGRAM

Presented by: Brian Denzel

☎ : 832-681-2554 ✉ : bdenzel@h-gac.com

About HGACBuy

- HGACBuy is a nationwide cooperative purchasing program operated by the Houston-Galveston Area Council of Governments

- Establishes contracts for products and service by virtue of a public competitive bid or RFP process in compliance with government purchasing statutes

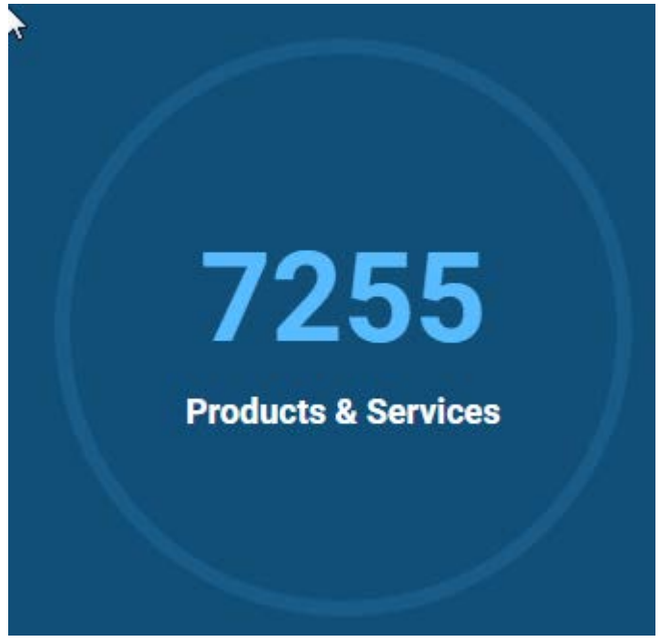
- The HGACBuy Program has been serving our members for over 40 years

Advantages of HGACBuy

- Increased number of manufacturers and products available
- Better pricing as a result of volume discounts
- Soft cost savings; more efficient use of time and resources
- Satisfy statute requirements for competitive bids/RFPs

More About HGACBuy

- Over 7,000 Members Nationwide
- Over 800 Contractors
- 38 Major Product Categories
- 7000 products and services



Types of Participating End Users

- Municipalities
- Counties
- Schools and School Districts
- Colleges & Universities
- Hospitals and Hospital Districts
- Emergency Services Districts
- Rural Fire Prevention Districts
- Volunteer Fire Departments
- Emergency Medical Services
- Special Law Enforcement Jurisdictions
- Judicial Courts & Districts
- Emergency Communications Districts Councils of Governments
- Utility Districts (MUDs, WCIDs, Irrigation, etc.)
- Special Districts
- Authorities (Airport, Port, River, Water, Toll Road, etc.)
- State Agencies
- Not-for-Profit Corporations providing one or more government functions and services

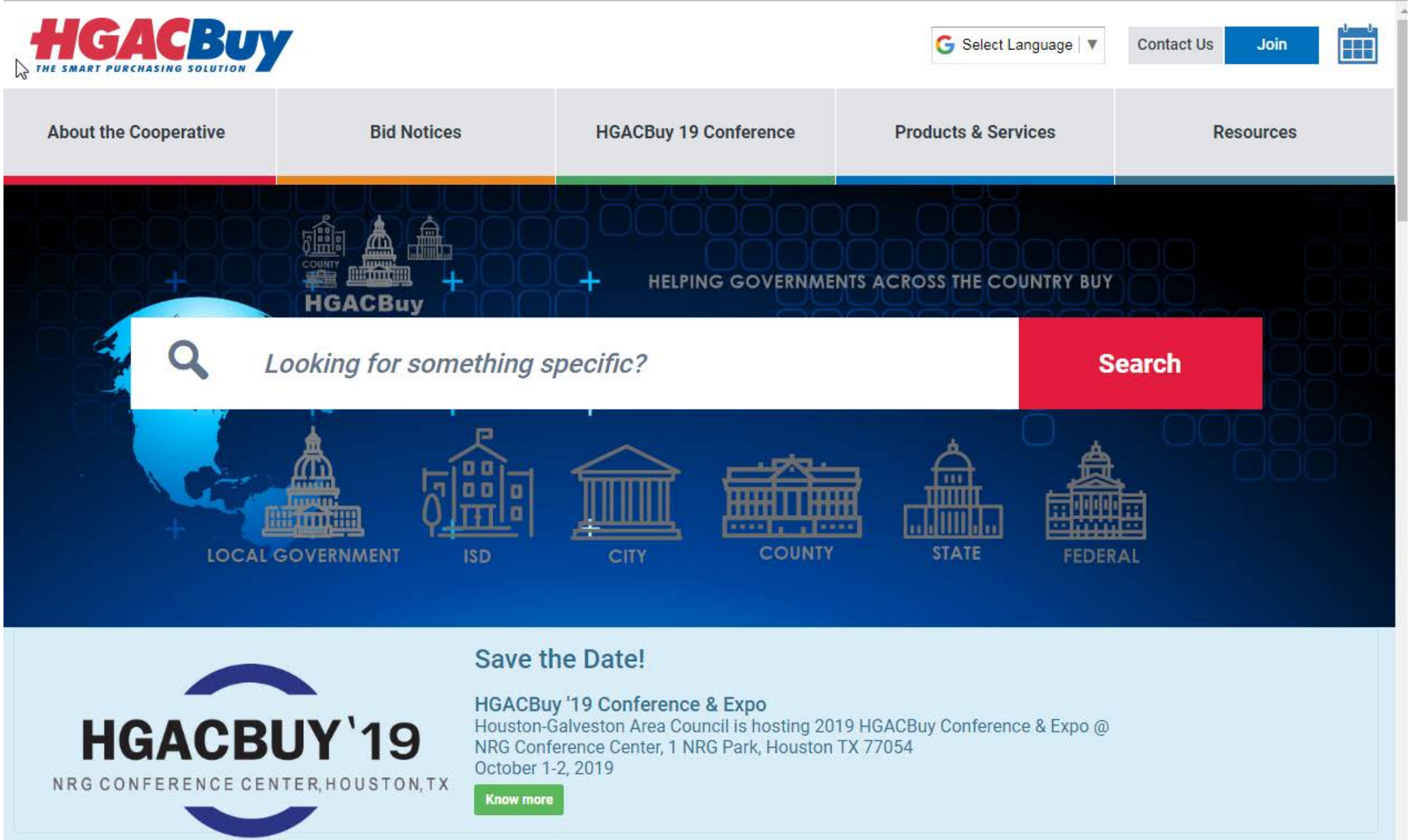
What is required to participate?

- Complete the HGACBuy Interlocal Contract Form --Available for download from the HGACBuy webpage
- Submit signed ILC documents to H-GAC via email, fax or regular mail for execution
- No cost for membership

Alternative Fuel Vehicles

Alternative Fuel Vehicles (CNG – Propane)

- AM10-18 – Ambulances, EMS, and Other Special Services Vehicles
- BS08-17 – School Buses
- BT01-19 – Buses – Shuttles, Transits, Trams, & Other Specialty Buses
- FS12-17 – Fire Apparatus
- HT06-18 – Medium & Heavy Trucks & Truck Bodies
- RH08-18 - Refuse Handling Equipment
- SW04- 18 – Sweeping Equipment
- VE11-18 – Current Model Cars & Light Trucks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Resources
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ISD
CITY
COUNTY
STATE
FEDERAL
HGACBUY '19
NRG CONFERENCE CENTER, HOUSTON, TX
Save the Date!
HGACBuy '19 Conference & Expo
Houston-Galveston Area Council is hosting 2019 HGACBuy Conference & Expo @
NRG Conference Center, 1 NRG Park, Houston TX 77054
October 1-2, 2019
Know more

Clear All Filters

Product Category

Search

- Communications Equipment & Services
- Consulting & Staffing Services
- Emergency Equipment & Supplies
- Emergency Preparedness & Disaster Recovery
- ✔ General Purpose, Emergency & Autonomous Vehicles
- Grounds Facilities & Parks Equipment
- Infrastructure Equipment & Services
- Public Works Equipment

Description:
Ambulances, EMS, and Other Special Service Vehicles

Number:
AM10-18

Effective Date:
10/01/2018 - 09/30/2020

Contract Details:
Ambulances; Light & Medium EMS/Rescue Vehicles, Mobile & Urban Command Vehicles; Mobile Command Centers. Many variations, options and accessories are available thru the HGACBuy contracts.

Full details

Description:
Automated Vehicles

Number:
AV11-18

Effective Date:
11/01/2018 - 10/31/2020

Contract Details:
HGACBuy has established contracts for Automated Vehicles through lease that are designed to serve urbanized environments such as universities, downtowns, office campuses, neighborhood "last mile" connections to transit facilities, along with associated maintenance and operations support.

Full details

Description:
Trailers - Equipment, Cargo, & Specialty

Number:
TR11-18

Effective Date:
11/01/2018 - 10/31/2020

Description:
Buses - Shuttles, Transits, Trams, & Other Specialty Buses

Number:
BT01-19

Effective Date:
01/01/2019 - 12/31/2021

Alternative Fuel Vehicles on North Texas SHARE

Any Entity with an Interlocal Agreement with North Texas SHARE can Take Advantage of the Opportunities

www.northtexasshare.org → Quick Links → Participating Organizations

All Contracts Through Sourcewell Available

Alternative Fuel Vehicle and Equipment Options Include:

Dallas-Fort Worth CLEAN CITIES

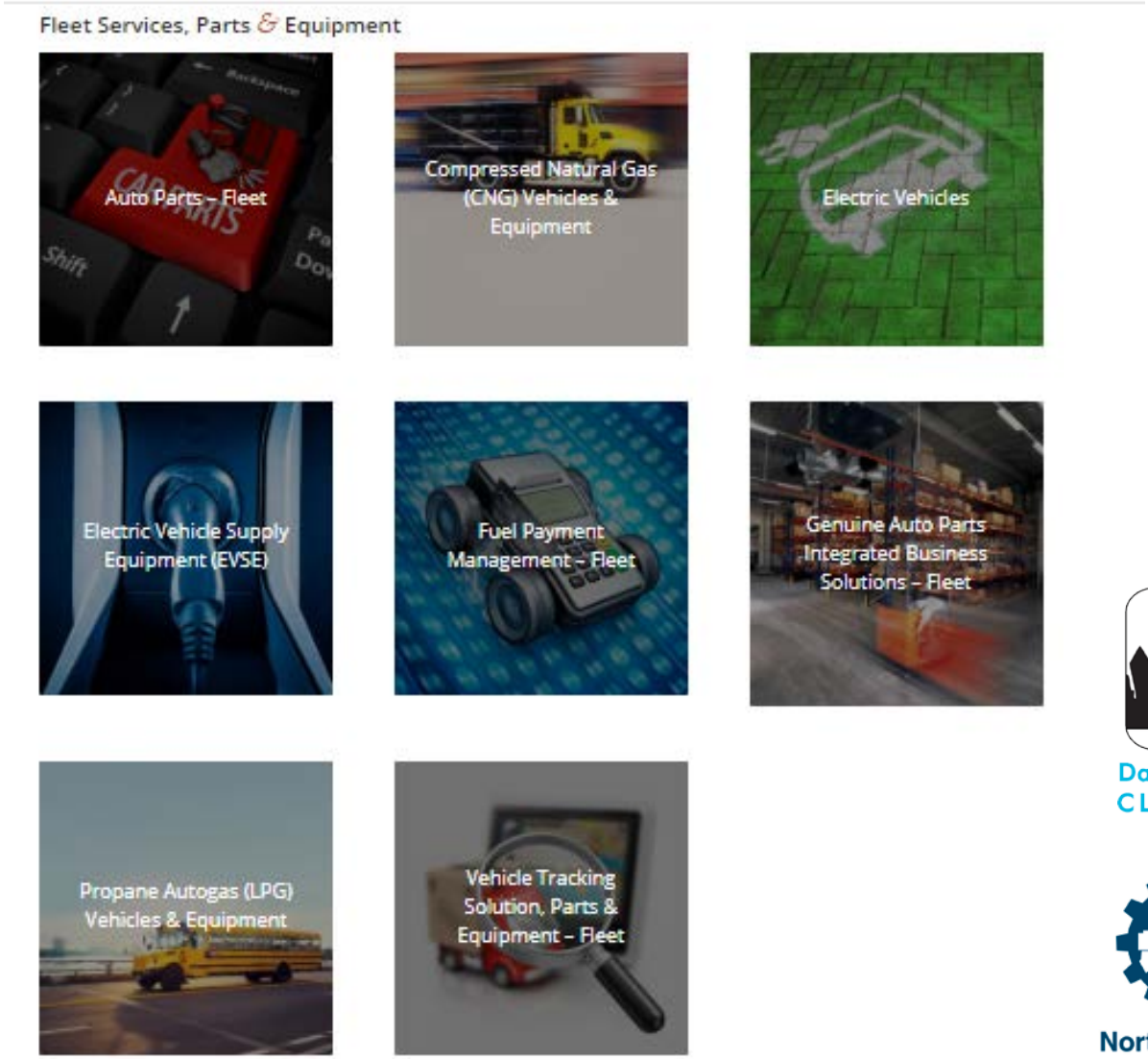
North Central Texas Council of Governments

Alternative Fuel Vehicles on North Texas SHARE

www.northtexasshare.org

Go to “Quick Links” → “Available Contracts”

Scroll to “Fleet Services, Parts & Equipment”

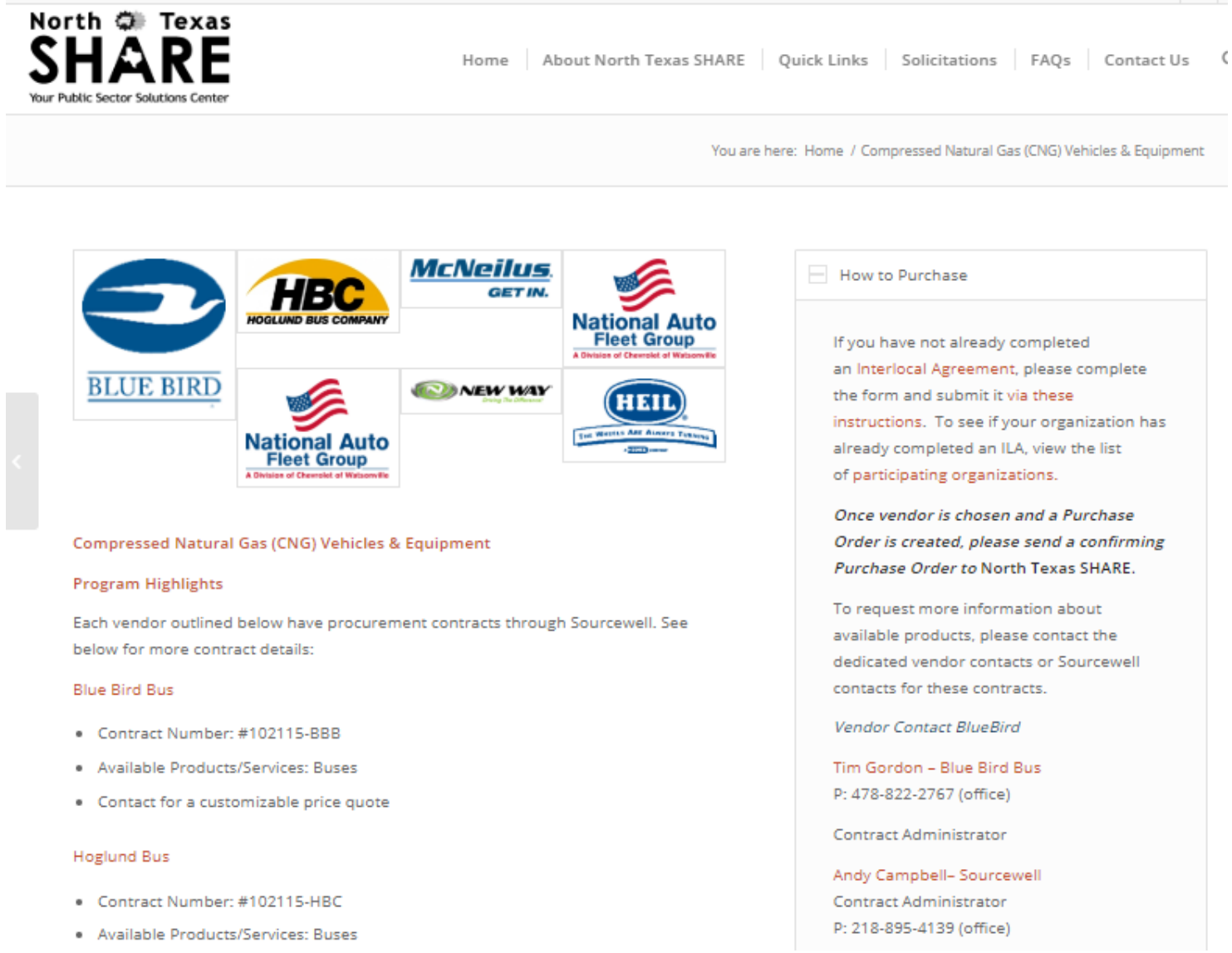


Dallas-Fort Worth CLEAN CITIES

North Central Texas Council of Governments

Alternative Fuel Vehicles on North Texas SHARE

Example:
CNG Vehicles



North Texas SHARE
Your Public Sector Solutions Center

Home | About North Texas SHARE | Quick Links | Solicitations | FAQs | Contact Us

You are here: Home / Compressed Natural Gas (CNG) Vehicles & Equipment

Blue Bird | HBC Hoglund Bus Company | McNeilus Get In. | National Auto Fleet Group | New Way | Heil | National Auto Fleet Group

Compressed Natural Gas (CNG) Vehicles & Equipment

Program Highlights

Each vendor outlined below have procurement contracts through Sourcewell. See below for more contract details:

Blue Bird Bus

- Contract Number: #102115-BBB
- Available Products/Services: Buses
- Contact for a customizable price quote

Hoglund Bus

- Contract Number: #102115-HBC
- Available Products/Services: Buses

How to Purchase

If you have not already completed an Interlocal Agreement, please complete the form and submit it via these instructions. To see if your organization has already completed an ILA, view the list of participating organizations.

Once vendor is chosen and a Purchase Order is created, please send a confirming Purchase Order to North Texas SHARE.

To request more information about available products, please contact the dedicated vendor contacts or Sourcewell contacts for these contracts.

Vendor Contact BlueBird

Tim Gordon – Blue Bird Bus
P: 478-822-2767 (office)

Contract Administrator

Andy Campbell– Sourcewell
Contract Administrator
P: 218-895-4139 (office)

Dallas-Fort Worth CLEAN CITIES

North Central Texas Council of Governments

Alternative Fuel Vehicles on North Texas SHARE

For More Information:

Lori Clark
Program Manager and DFW Clean Cities Coordinator
lclark@nctcog.org
(817) 695-9232

www.northtexasshare.org

Dallas-Fort Worth CLEAN CITIES

North Central Texas Council of Governments

Pathway to Zero

Kris Russell

Environmental Program Manager

DALLAS
FORT WORTH

DFW AIRPORT RANKINGS

- 4th in the world for flights
- 15th in the world for passengers

187 domestic destinations

62 international destinations

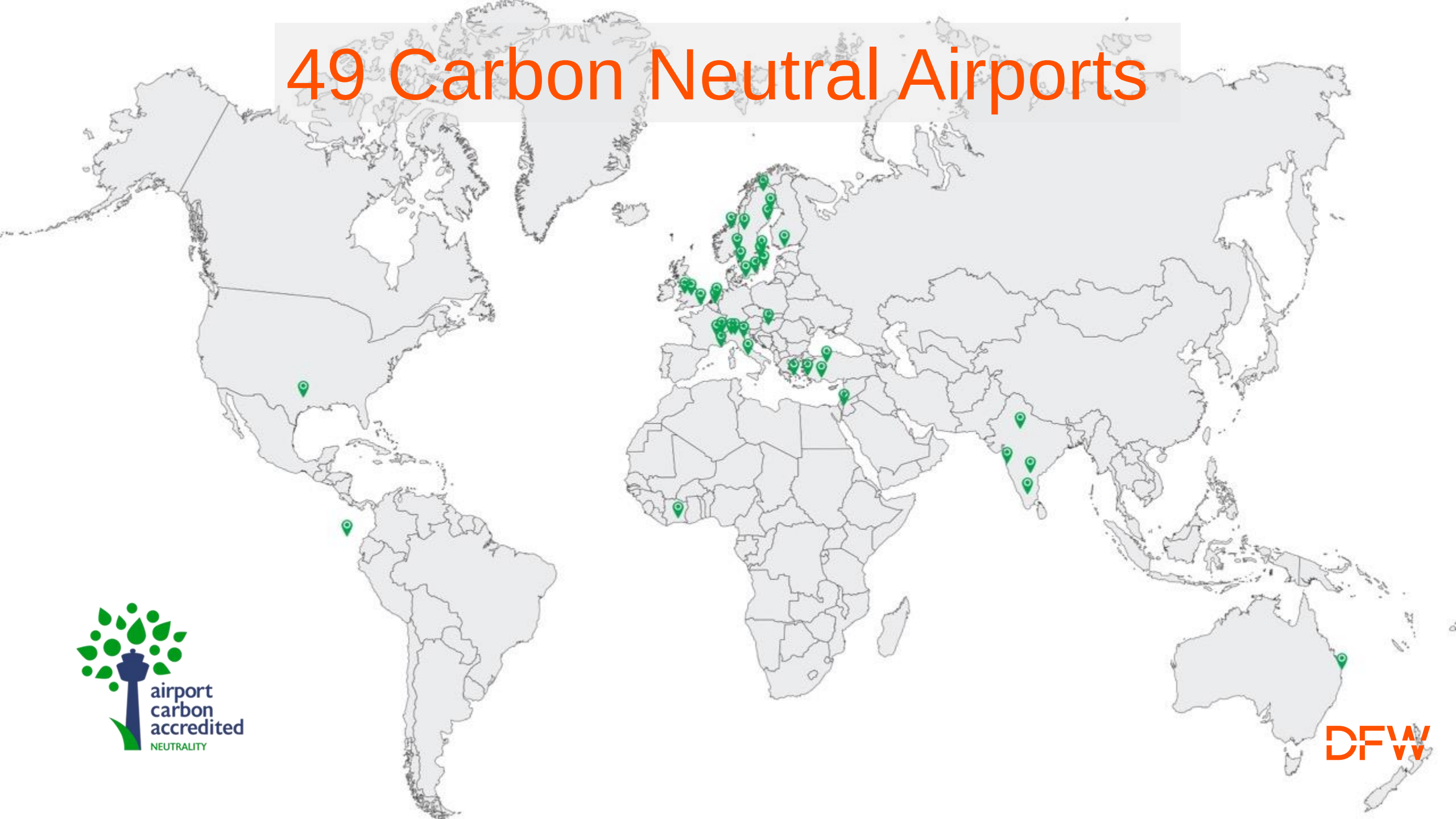
DFW

198,000

DAILY CUSTOMERS


airport
carbon
accredited
NEUTRALITY
CARBON NEUTRAL
DFW

49 Carbon Neutral Airports

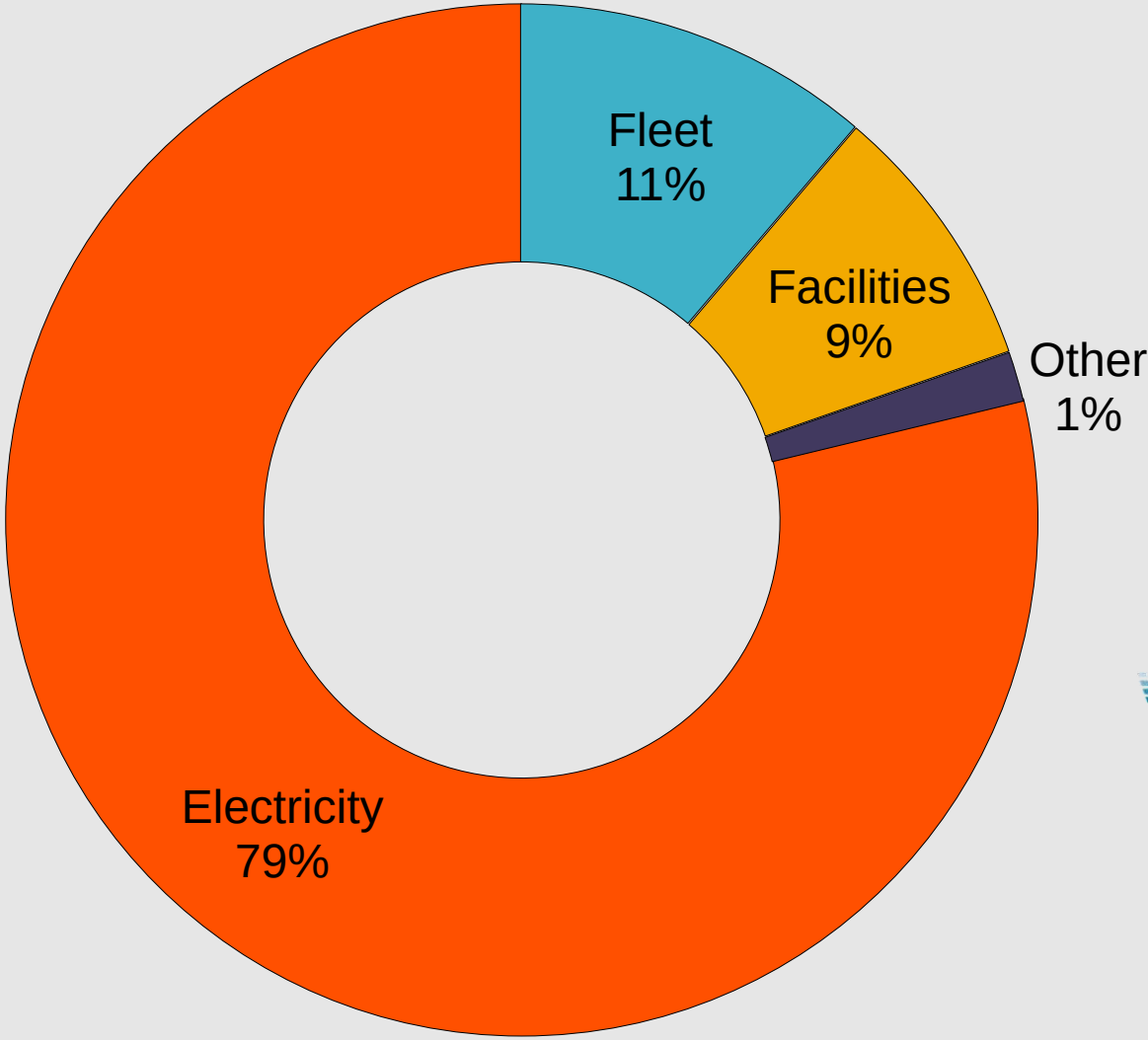


airport carbon accredited
NEUTRALITY

DFW

ACHIEVING NEUTRALITY

100% Renewable Energy
Texas Wind Power



Carbon Offsets
Texas Landfill and Wastewater Treatment Plant Methane Capture Projects

airport carbon accredited NEUTRALITY

VCS VERIFIED CARBON STANDARD
A Global Benchmark for Carbon

CLIMATE ACTION RESERVE

DFW

DFW Transportation

13 Million

Annual Transit Passengers

11 Million

Annual Vehicle Miles Traveled

2 Million

Diesel Gallon Equivalents of CNG

18 Hours

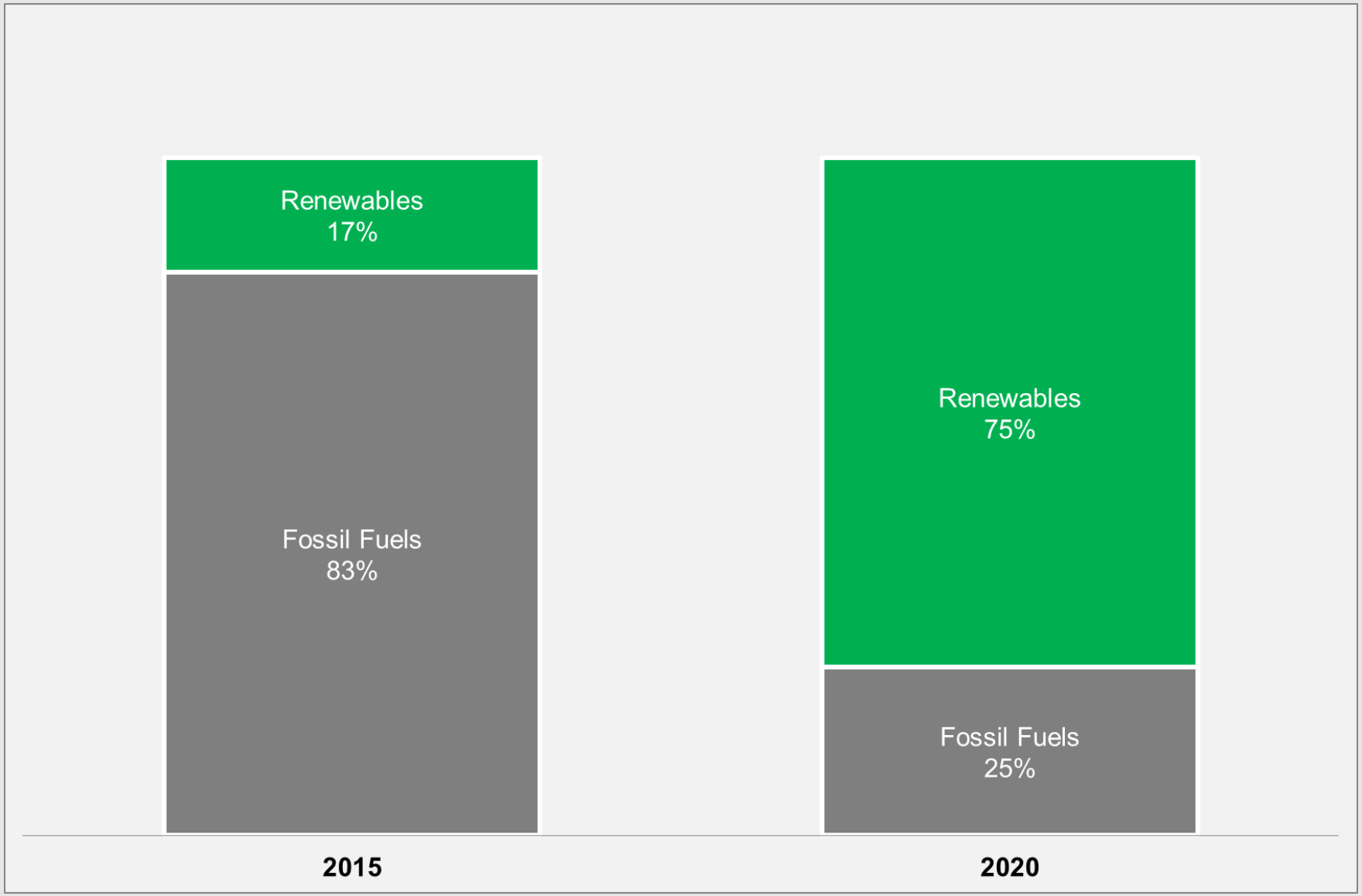
Circumnavigate the earth


Rental Car Center
CNG
DFW

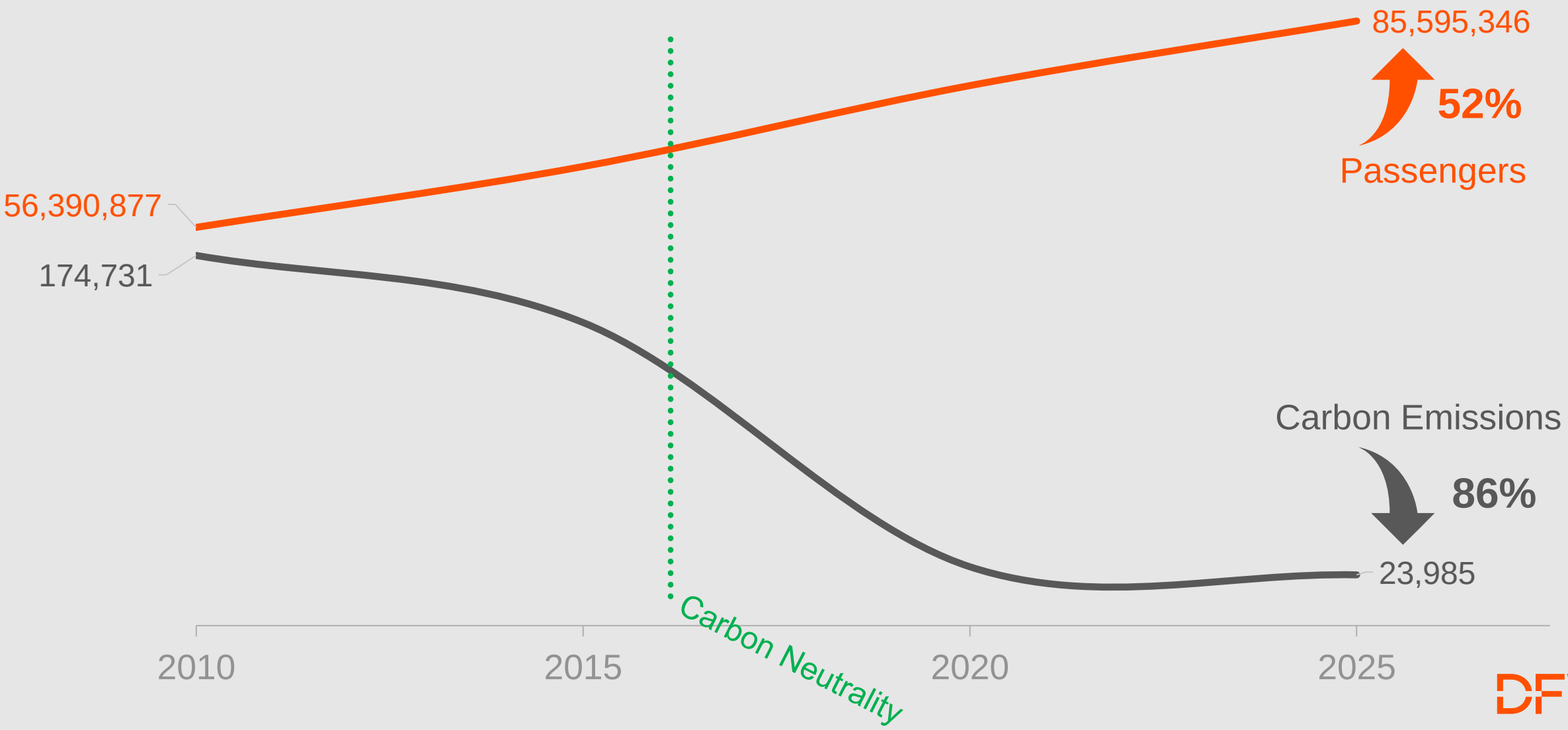
RENEWABLE NATURAL GAS

In 2018, over 40% of natural gas used in vehicles was renewable natural gas produced from local landfills

Growing renewables at DFW



Decoupling Growth from Emissions



WHAT'S NEXT?

TRANSPORTATION HUB EFFICIENCY RESEARCH

Partnership with national laboratories

Modeling integration of new technologies to improve mobility and reduce congestion

athena

NREL
Transforming ENERGY

OAK RIDGE
National Laboratory

DFW

ELECTRIFYING TRANSPORTATION

Electric vehicle charging infrastructure deployed for passengers and employees.

Current research underway to electrify future fleets.

SUSTAINABLE FUELS

DFW is working with airlines and business partners to facilitate the use of sustainable transportation fuels at DFW.


Travel. Transformed.
DFW

EarthX Clean Transportation Workshop Contact List

Name	Title	Organization	Session	Email	Phone Number
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Date: April 26, 2019

Typical Funding Opportunities for On-Road Vehicles and Refueling Infrastructure

Corrections in red were made after the EarthX workshop on April 26, 2019.

Funding Agency	Program	Status	Eligible Applicants	Eligible Activities	Old Vehicle Criteria*	Eligible Funding Levels
Propane Council of Texas	Propane Council of Texas Incentives	Open	Private fleets, local governments, state fleets, law enforcement, school white fleets, or non-profit fleets	- Purchase new, factory-direct propane; engine OEM and/or aftermarket conversions to propane	**N/A for purchase** **For aftermarket conversion:** **Fuel:** Gasoline **Mileage:** < 40,000 miles on odometer	Up to $7,500 per vehicle or conversion
IC Bus	IC Bus Grant Program	Open	School districts	- Purchase new propane CE Series school buses	N/A	$5,000 per bus
Texas Commission on Environmental Quality	TERP Seaport and Rail Yard Areas Emissions Reduction Program	Open until May 29, 2019	Any entity that can operate the vehicle or equipment operating at least 200 days per year of eligible seaport terminals and Class I intermodal rail yards	- Replace or repower drayage trucks and cargo handling equipment	**Weight:** Over 26,000 GVWR	Up to 80% of the new replacement vehicle or engine minus $1,000 scrap for replacements and $250 scrap for repowers, capped at $25,000 per ton NOx reduced
Texas Commission on Environmental Quality	TERP Texas Natural Gas Vehicle Grant Program	Open until May 31, 2019	Public and private entities	- Replace or repower a heavy-duty or medium-duty motor vehicle with a CNG, LNG, or LPG, engine or vehicle	**Fuel:** Diesel or gasoline **Weight:** Over 8,500 GVWR	Up to 90% of the new replacement vehicle or engine minus $1,000 scrap for replacements and $250 scrap for repowers
Texas Commission on Environmental Quality	TERP Light-Duty Motor Vehicle Purchase or Lease Incentive Program	Open until May 31, 2019	Public or private entities/individuals	- Purchase or lease new light-duty motor vehicle powered by CNG, LPG, or hydrogen fuel cell, or plug-in or plug-in hybrid	N/A	Up to $5,000 for eligible CNG or LPG Up to $2,500 for eligible hydrogen fuel cell or other electric drive (plug-in or plug-in hybrid)
Texas Department of Agriculture	Fire, Ambulance and Services Truck (FAST) Fund	Open until June 13, 2019	Non-Entitlement Communities (generally cities located predominately in rural areas with populations of less than 50,000 persons, and counties predominately rural in nature and generally have fewer than 200,000 persons in the non-entitlement cities and unincorporated areas)	- Purchase fire trucks, ambulances and similar emergency medical vehicles, jaws of life and similar rescue equipment; and/or rescue boats and similar specialized emergency vehicles	N/A	Up to $500,000 per jurisdiction
Texas Commission on Environmental Quality	Volkswagen Environmental Mitigation Trust	Expected Spring 2019	Public or private entities/individuals	- Replace or repower heavy-duty vehicles or equipment	**Fuel:** Diesel **Model Year:** 1992 - 2009 **Weight:** 14,001 GVWR and up	For Government Owned: Up to 80% For Private Sector: Up to 50% if electric, up to 40% reimbursement for repower, and up to 25% reimbursement for replacement (50% if drayage)
North Central Texas Council of Governments	Clean Fleets North Texas	Expected Late Spring 2019	Local governments or private companies that contract with local governments	- Replace heavy-duty vehicles and equipment	**Fuel:** Diesel **Model Year:** 1996 - 2006 (up to 2009 if replacing with electric) **Weight:** 16,001 GVWR and up	**Up to 45%** cost if new is electric **Up to 35%** cost if new is powered by engine certified to CARB optional low-NOx standards (both NG and LPG engines currently available) **Up to 25%** cost for all others
Texas Commission on Environmental Quality	TERP Emissions Reduction Incentive Grants	Expected Fall 2019	Public or private entities/individuals	- Replace, repower, new purchase or lease, or retrofit or add-on of emission-reduction technology, of heavy-duty vehicles, equipment, locomotives, or marine vessels - Install on-vehicle electrification and idle reduction infrastructure, refueling infrastructure (not diesel or gasoline), on-site electrification and idle reduction infrastructure, or rail relocation and improvement	**Weight:** Over 8,500 GVWR	Up to 80% of the new replacement vehicle or engine minus $1,000 scrap for replacements and $250 scrap for repowers, capped at $17,500 per ton NOx reduced For new purchase or lease, funds will pay for the cost difference between the manufacturer's suggested retail price of a baseline vehicle certified to the current federal NOx emission standards and the actual cost of the cleaner vehicle
Environmental Protection Agency	Diesel Emissions Reductions Act (DERA) Clean Diesel Funding Assistance Program	Anticipated Late 2019/Early 2020	Public entities	- Replace or repower heavy-duty vehicles or equipment	**Fuel:** Diesel **Model Year:** 1996 - 2009 (newer than 2010 if replacing with electric) **Weight:** 16,001 GVWR and up	**Up to 45%** cost if new vehicle is electric; up to 60% if repower **Up to 35%** cost if new is powered by engine certified to CARB optional low-NOx standards (both NG and LPG engines currently available); up to 50% if repower **Up to 25%** cost for all others; up to 40% if repower
Texas Commission on Environmental Quality	TERP Clean School Bus Program	Anticipated Late 2019/Early 2020	Any school district, charter school, or transportation system provided by a countywide school district	- Replace or retrofit buses	**Fuel:** Diesel **Model Year:** 2006 and older	Up to 75% of the cost of the new replacement vehicle minus $1,000 scrap for replacements
Environmental Protection Agency	DERA School Rebate Program	Anticipated Late 2019/Early 2020	Regional, state, or tribal agency that has jurisdiction over transportation and air quality, including school districts and municipalities, and private entities that contract with them	- Replace buses	**Fuel:** Diesel **Model Year:** 2006 and older **Weight:** Over 10,000 GVWR	$15,000 for buses between 10,001 - 19,500 GVWR $20,000 for buses with GVWR of 19,501 or higher
Texas Commission on Environmental Quality	TERP Texas Clean Fleet Program	Anticipated Early 2020	Any entity who owns a fleet of at least 75 vehicles and submit a grant application for at least 10 qualifying vehicles	- Replace diesel powered vehicles with alternative fuel or hybrid vehicles	**Fuel:** Diesel	Up to 80% of the new replacement vehicle or engine minus $1,000 scrap for heavy-duty vehicles and $500 scrap for light-duty vehicles
Texas Commission on Environmental Quality	TERP Rebate Grants Program	Anticipated Early 2020	Public or private entities/individuals	- Replace or repower heavy-duty vehicles or equipment	**Fuel:** Diesel **Weight:** Over 8,500 GVWR	Up to 80% of new replacement vehicle or engine minus $1,000 scrap for replacements and $250 scrap for repowers

Source: North Central Texas Council of Governments

Last Updated: May 2, 2019

Typical Funding Opportunities for On-Road Vehicles and Refueling Infrastructure

Corrections in red were made after the EarthX workshop on April 26, 2019.

Infrastructure Funding Opportunities						
Funding Agency	**Program**	**Status**	**Eligible Applicants**	**Eligible Activities**	**Other Criteria**	**Eligible Funding Levels**
State Energy Conservation Office	LoanSTAR Program	Open until August 30, 2019	Governments, school districts, institutions of higher education, and tax-supported public hospital districts	- Funds energy-related, cost-reduction retrofit projects such as the installation of rooftop solar water and space heating systems, geothermal heat pumps, and small wind and solar-thermal systems	N/A	Up to $8 million in loan size For loans funded with repaid ARRA funds, minimum loan size is $3 million
Texas Commission on Environmental Quality	Volkswagen Environmental Mitigation Trust	Expected Fall 2019	Public or private entities/individuals	- Funds charging infrastructure in public places, workplaces, or multi-unit dwellings	N/A	Up to 50% for electric vehicle supply equipment Up to 33% of hydrogen fuel cell supply equipment capable of dispensing at least 250 kg per day, or up to 25% for equipment capable of dispensing at least 100 kg per day
Texas Commission on Environmental Quality	TERP Alternative Fueling Facilities Program	Expected Fall 2019/Late 2020	Public or private entities/individuals	- Funds new construction or the expansion of existing alternative or natural gas fueling facilities	N/A	Up to $400,000 for a compressed natural gas CNG or LNG project Up to $600,000 for a combined CNG and LNG project Up to 50% or maximum of $600,000, whichever is less, for fuels other than natural gas

For more information and the latest updates, visit www.nctcog.org/agfunding

California Air Resources Board (CARB); Compressed Natural Gas (CNG); Gross Vehicle Weight Rating (GVWR); Liquefied Natural Gas (LNG); Liquefied Petroleum Gas (LPG); Original Equipment from the Manufacturer (OEM); Texas Emissions Reduction Plan (TERP)

*The criteria presented is not a comprehensive listing, and each program may have additional criteria such as operating hours, a specific counties of operation, vehicle registration limitations, etc.

Source: North Central Texas Council of Governments

Last Updated: May 2, 2019

Typical Funding Opportunities for School Districts

Corrections in red were made after the EarthX workshop on April 26, 2019.

School Bus Funding Opportunities					
Funding Agency	**Program**	**Status**	**Eligible Activities**	**Old Vehicle Criteria***	**Eligible Funding Levels**
Propane Council of Texas	Propane Council of Texas Incentives	Open	- Purchase new, factory-direct propane; engine OEM and/or aftermarket conversions to propane	**N/A for purchase** **For aftermarket conversion:** **Fuel**: Gasoline **Mileage**: < 40,000 miles on odometer	Up to $7,500 per vehicle or conversion
IC Bus	IC Bus Grant Program	Open	- Purchase new propane CE Series school buses	N/A	$5,000 per bus
Texas Commission on Environmental Quality	TERP Texas Natural Gas Vehicle Grant Program	Open until May 31, 2019	- Replace or repower buses with CNG, LNG, or LPG, engine or vehicle	**Fuel:** Diesel or gasoline **Weight:** Over 8,500 GVWR	Up to 90% of the cost of the replacement vehicle or engine minus $1,000 scrap for replacements and $250 scrap for repowers
Texas Commission on Environmental Quality	Volkswagen Environmental Mitigation Trust	Expected Spring 2019	- Replace or repower buses	**Fuel:** Diesel **Model Year:** 2009 and older **Weight:** Over 14,000 GVWR	Up to 80% reimbursement for repower or replacement for school districts Private company that provides bus service: Up to 50% if electric, up to 40% reimbursement for repower, and up to 25% reimbursement for replacement
North Central Texas Council of Governments	Clean Fleets North Texas	Expected Late Spring 2019	- Replace buses	**Fuel:** Diesel **Model Year:** 1996 - 2006 (up to 2009 if replacing with electric) **Weight:** 16,001 GVWR and up	**Up to 45%** cost if new is electric **Up to 35%** cost if new is powered by engine certified to CARB optional low-NOx standards (both NG and LPG engines currently available) **Up to 25%** cost for all others
Texas Commission on Environmental Quality	TERP Emissions Reduction Incentive Grants	Expected Fall 2019	- Replace, repower, new purchase or lease, or retrofit or add-on of emission-reduction technology, of heavy-duty vehicles, equipment, locomotives, or marine vessels - Install on-vehicle electrification and idle reduction infrastructure, refueling infrastructure (not diesel or gasoline), on-site electrification and idle reduction infrastructure, or rail relocation and improvement	**Weight:** Over 8,500 GVWR	Up to 80% of the new replacement vehicle or engine minus $1,000 scrap for replacements and $250 scrap for repowers, capped at $17,500 per ton NOx reduced For new purchase or lease, funds will pay for the cost difference between the manufacturer's suggested retail price of a baseline vehicle certified to the current federal NOx emission standards and the actual cost of the cleaner vehicle
Environmental Protection Agency	Diesel Emissions Reductions Act (DERA) Clean Diesel Funding Assistance Program	Anticipated Late 2019/Early 2020	- Replace or repower buses	**Fuel:** Diesel **Model Year:** 1996 - 2009 (newer than 2010 if replacing with electric) **Weight:** 16,001 GVWR and up	**Up to 45%** cost if new vehicle is electric; up to 60% if repower **Up to 35%** cost if new is powered by engine certified to CARB optional low-NOx standards (both NG and LPG engines currently available); up to 50% if repower **Up to 25%** cost for all others; up to 40% if repower
Environmental Protection Agency	DERA School Rebate Program	Anticipated Late 2019/Early 2020	- Replace buses	**Fuel:** Diesel **Model Year:** 2006 and older **Weight:** Over 10,000 GVWR	$15,000 for replacement buses between 10,001 - 19,500 GVWR, and $20,000 for replacement buses with GVWR of 19,501 or higher
Texas Commission on Environmental Quality	TERP Clean School Bus Program	Anticipated Late 2019/Early 2020	- Replace or retrofit buses	**Fuel:** Diesel **Model Year:** 2006 and older	Up to 75% of the cost of the new replacement vehicle minus $1,000 scrap for replacements
Texas Commission on Environmental Quality	TERP Texas Clean Fleet Program	Anticipated Early 2020	- Replace buses with alternative fuel or hybrid vehicles	**Fuel:** Diesel	Up to 80% of the new replacement vehicle or engine minus $1,000 scrap for heavy-duty vehicles and $500 scrap for light-duty vehicles
Texas Commission on Environmental Quality	TERP Rebate Grants Program	Anticipated Early 2020	- Replace or repower buses	**Fuel:** Diesel **Weight:** Over 8,500 GVWR	Up to 80% of new replacement vehicle or engine minus $1,000 scrap for replacements and $250 scrap for repowers
Infrastructure Funding Opportunities					
Funding Agency	**Program**	**Status**	**Eligible Activities**	**Other Criteria**	**Eligible Funding Levels**
State Energy Conservation Office	LoanSTAR Program	Open until August 30, 2019	- Funds energy-related, cost-reduction retrofit projects such as the installation of rooftop solar water and space heating systems, geothermal heat pumps, and small wind and solar-thermal systems	N/A	Up to $8 million in loan size For loans funded with repaid ARRA funds, minimum loan size is $3 million
Texas Commission on Environmental Quality	Volkswagen Environmental Mitigation Trust	Expected Fall 2019	- Funds charging infrastructure in public places, workplaces, or multi-unit dwellings	N/A	Up to 50% for electric vehicle supply equipment Up to 33% of hydrogen fuel cell supply equipment capable of dispensing at least 250 kg per day, or up to 25% for equipment capable of dispensing at least 100 kg per day
Texas Commission on Environmental Quality	TERP Alternative Fueling Facilities Program	Expected Fall 2019/Late 2020	- Funds new construction or the expansion of existing alternative or natural gas fueling facilities	N/A	Up to $400,000 for a compressed natural gas CNG or LNG project Up to $600,000 for a combined CNG and LNG project Up to 50% or maximum of $600,000, whichever is less, for fuels other than natural gas

For more information and the latest updates, visit www.nctcog.org/aqfunding

California Air Resources Board (CARB); Compressed Natural Gas (CNG); Gross Vehicle Weight Rating (GVWR); Liquefied Natural Gas (LNG); Liquified Petroleum Gas (LPG); Original Equipment from the Manufacturer (OEM); Texas Emissions Reduction Plan (TERP)

*The criteria presented is not a comprehensive listing, and each program may have additional criteria such as operating hours, a specific counties of operation, vehicle registration limitations, etc.

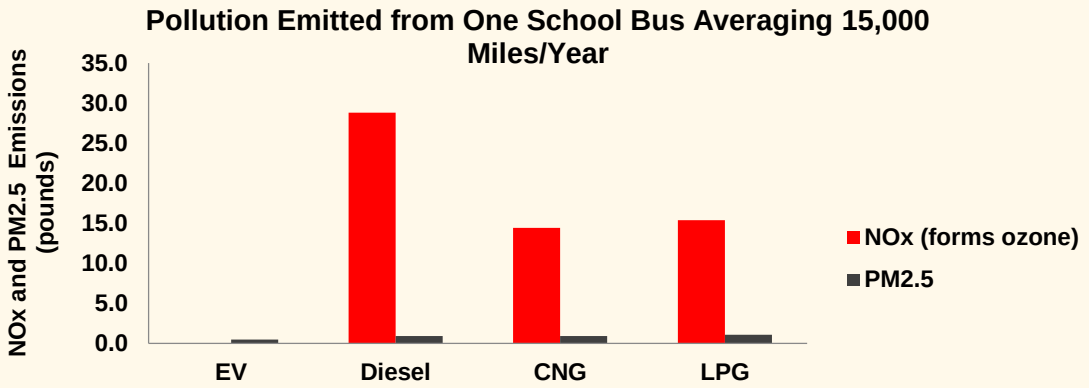
Source: North Central Texas Council of Governments

Last Updated: May 2, 2019

REDUCE COSTS AND IMPROVE AIR QUALITY with Alternative Fuel School Buses

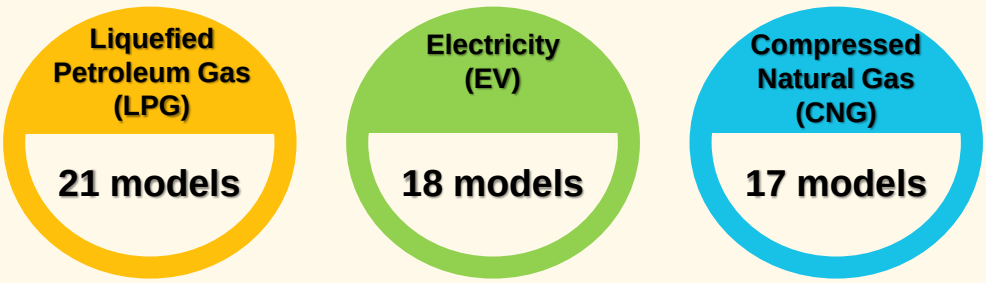
Did you know?

- 19 counties in Texas violate federal ozone standards, which means that the air in these counties can be unhealthy.
- Diesel engines emit more nitrogen oxides (NO_X) and particulate matter (PM) than alternative fuel engines.
- NO_X forms ozone, which hurts the environment and aggravates respiratory issues.
- Diesel exhaust is thought to cause lung damage when inhaled, and is a likely cause of cancer.



Resource: Argonne National Laboratory's Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool

What to do about it? Replacing old diesel buses with alternative fuels helps reduce air pollution. Alternative fuel bus availability as of September 2018 includes:



Benefits of Alternative Fuel School Buses include:

- Engines burn cleaner; some CNG and LPG emit 90% less NO_X cleaner than new, clean diesel engines.
- Domestically produced fuel.
- No risks of fuel leaks impacting water supplies.
- Lower fuel and maintenance costs means that buses costs less over time.
- A variety of incentive programs available, in addition to cooperative purchasing options:
    - See available contracts at www.NorthTexasShare.org
    - Browse incentive program details at www.NCTCOG.org/AQFunding

For more information, contact cleancities@nctcog.org

Dallas-Fort Worth CLEAN CITIES

North Texas SHARE
Your Public Sector Solutions Center

nct clean school bus

north central texas clean school bus program

IMPROVE YOUR COMMUNITY

alternative fuel

SCHOOL BUSES

facts + benefits

- lower fuel and maintenance costs
- domestically produced fuels
- reduce harmful NO_x tailpipe emissions
- no diesel exhaust emissions near children
- incentives available to reduce upfront cost

For information about clean school bus funding, contant cleancities@nctcog.org or visit NCTCOG.org/CleanSchoolBus

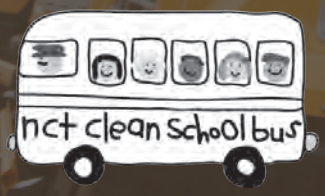
PROGRAM HOSTS

North Central Texas Council of Governments

The North Central Texas Council of Governments (NCTCOG) is a voluntary association of, by and for local governments, established to assist in regional planning. NCTCOG's purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions.

Dallas-Fort Worth CLEAN CITIES

The Dallas-Fort Worth (DFW) Clean Cities Coalition is hosted within the NCTCOG. Through this program, we work with local fleets to promote practices and decisions to reduce petroleum consumption and improve air quality. DFW was one of the first regions to be designated as part of the DOE Clean Cities initiative in 1995. DFW Clean Cities stakeholders reduce petroleum use by over 20 million gallons annually by using alternative fuel vehicles, reducing idling, and saving fuel through other best practices.



The purpose of the Clean School Bus program is to reduce emissions from school bus fleets and improve air quality in the DFW region. Improving air quality will help the region attain the federal air quality standards as well as reduce health impacts associated with poor air quality. The program provides educational materials to schools, districts, and bus operators about various options that can improve school bus fleets, benefit the environment, and protect the health of school aged children.

2018 year in review

Dallas-Fort Worth CLEAN CITIES

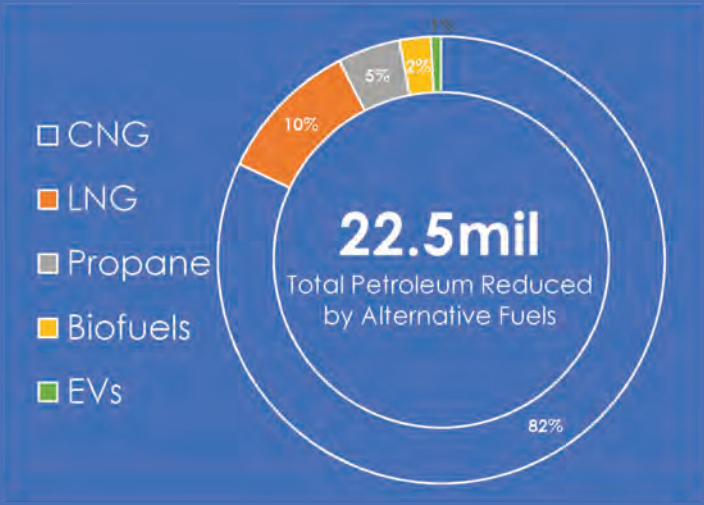
Annual Report

The Dallas-Fort Worth (DFW) Clean Cities Coalition works with local fleets to promote practices and decisions to reduce petroleum consumption and improve air quality. The Annual Report is a collection of yearly surveys completed by fleets in the region showing their petroleum reductions through collaborative efforts between the fleets and DFW Clean Cities.

~23mil
gallons of gasoline equivalent reduced

~32.8K
tons of greenhouse gas reduced equivalent to emissions from 162 railcars of coal burned

~782k
lbs. of nitrogen oxides reduced



6,993
Vehicles Across 32 Fleets Surveyed

526
Electric Vehicles Across 5 Fleets

387
LPG Vehicles Across 9 FLeets

3,408
Biofuel Vehicles Across 9 Fleets

100
LNG Vehicles Across 1 Fleet

2,572
CNG Vehicles Across 8 Fleets

Alternative Fuel Acronym Key
CNG = Compressed Natural Gas
LNG = Liquefied Natural Gas
LPG = Propane
EV = Electric Vehicle (Battery Electric, Plug-In Hybrid, Hybrid)
Biofuel = Ethanol, Biodiesel, Renewable Diesel

Fleets Employing Additional Fuel Efficiency Measures

Fleet Recognition

Fleets are awarded based upon their submittal of the DFW Clean Cities Annual Survey due every February.

This is the fourth year of recognition awards.

Dallas-Fort Worth CLEAN CITIES Silver Fleet

- Dallas
- DFW Airport
- Euless
- North Richland Hills
- Richardson
- Southlake

Dallas-Fort Worth CLEAN CITIES Bronze Fleet

- Addison
- Carrollton
- Coppell
- DART
- Denton
- Denton ISD
- Flower Mound
- Irving
- Lewisville
- Plano
- Tarrant County
- Trinity Metro

Electric Vehicles North Texas

Unlike other alternative fuels, electric vehicles in all their forms are an increasingly common sight in the DFW region, especially with the general public. With limited to zero emissions, electric vehicles have a significant impact on improving regional air quality.

6,701
EVs in DFW Area

48%
Growth since Dec. 2017

Estimated Annual Emission Reductions*

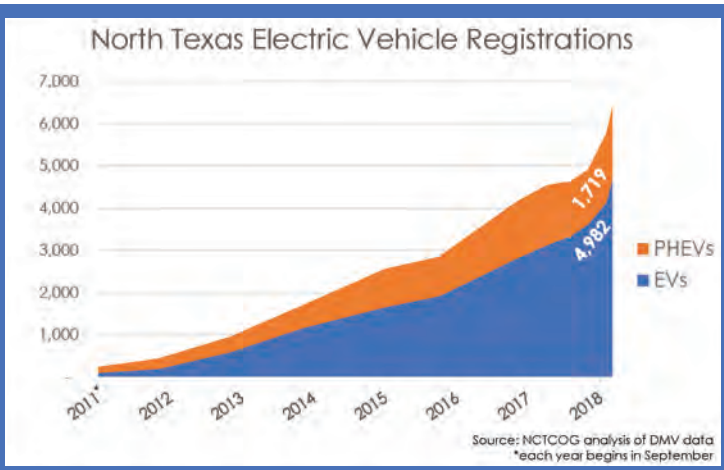
~2.26mil
Gasoline Gallon Equivalent

~10k lbs.
NOx

~13k tons
Greenhouse Gas Emissions

~14.8k lbs.
Volatile Organic Compounds

*Using the Argonne National Laboratory's AFLEET Tool



Drive Electric Week

169
EVs Attended

2nd Largest
Event in the Country

627
Registered Attendees

9.8.18
Grapevine Mills Mall

Outreach By the Numbers in 2018

+110,000
Reached at Community Outreach Events

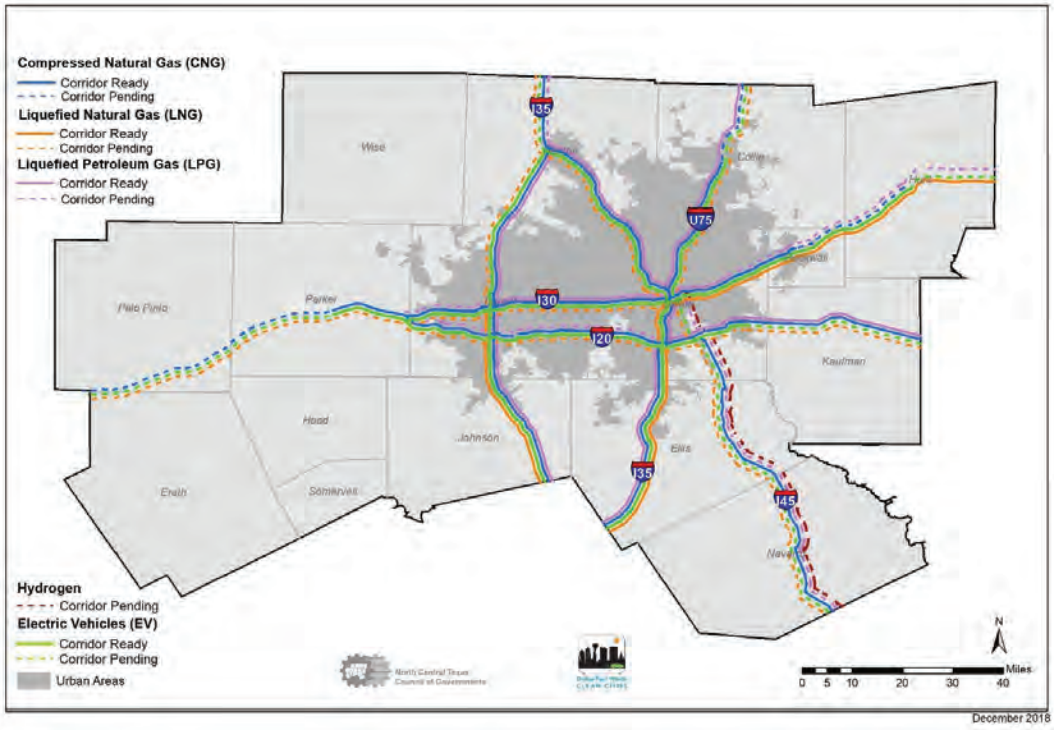
+1,000
E-blast Subscribers
138 added this Year

+4,000
Website Visitors

14
DFW Clean Cities Hosted Events

Alternative Fuel Corridors

Alternative Fuel Corridors are roadways within the National Highway System that provide sufficient alternative fuel and charging facilities for motorists. This initiative aims to develop a robust national network of alternative fueling and charging infrastructure, with correlated signage, along the National Highway System to improve the mobility of motorists that drive vehicles powered by alternative fuels or electricity.



Number of Public Fueling Station in DFW Area

6
LNG Stations

9
LPG Stations

25
CNG

322
EV Stations

Total Miles of Designated Corridors in North Texas

441
Miles of CNG Corridor

335
Miles of EV Corridor

284
Miles of LPG Corridor

149
Miles of LNG Corridor

North Central Texas
Council of Governments

The North Central Texas Council of Governments (NCTCOG) is a voluntary association of, by and for local governments, established to assist in regional planning. NCTCOG's purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions.

Dallas-Fort Worth
CLEAN CITIES

The Dallas-Fort Worth (DFW) Clean Cities Coalition is hosted within the NCTCOG. Through this program, we work with local fleets to promote practices and decisions to reduce petroleum consumption and improve air quality. DFW was one of the first regions to be designated as part of the DOE Clean Cities initiative in 1995. DFW Clean Cities stakeholders reduce petroleum use by over 20 million gallons annually by using alternative fuel vehicles, reducing idling, and saving fuel through other best practices.

THANK YOU!

your dfw clean cities team