Texas Bets Big with Alternative Fuels
Texas Energy Summit
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DFW Clean Cities Coordinator
Benefits of Alternative Fuels

- Lower Price Volatility
- Increased Energy Security
- Reduced Cost of Ownership
- Reduced Emissions
Alternative Fuel Benefits – Lower Price Volatility

Average U.S. Retail Fuel Prices per Gasoline Gallon Equivalent

Alternative Fuel Benefits – Lower Costs

**Source:** Argonne National Laboratory Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool; [https://greet.es.anl.gov/afleet](https://greet.es.anl.gov/afleet)

**EV Has Lowest Total Cost of Ownership**

![Bar chart comparing total cost of ownership for gasoline, gasoline PHEV, and EV passenger cars.]

<table>
<thead>
<tr>
<th>Category</th>
<th>Gasoline</th>
<th>Gasoline PHEV</th>
<th>EV</th>
</tr>
</thead>
<tbody>
<tr>
<td>License and Registration</td>
<td>$1,801</td>
<td>$1,801</td>
<td>$1,801</td>
</tr>
<tr>
<td>Insurance</td>
<td>$16,633</td>
<td>$16,633</td>
<td>$16,633</td>
</tr>
<tr>
<td>Maintenance and Repair</td>
<td>$29,514</td>
<td>$28,018</td>
<td>$26,006</td>
</tr>
<tr>
<td>Diesel Exhaust Fluid</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Fuel</td>
<td>$18,108</td>
<td>$11,055</td>
<td>$8,701</td>
</tr>
<tr>
<td>Depreciation</td>
<td>$18,590</td>
<td>$30,209</td>
<td>$27,885</td>
</tr>
<tr>
<td>Financing</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>
Alternative Fuel Benefits – Air Quality

Well-to-Wheels Emissions Impacts – Nitrogen Oxides (NO$_x$)
Representative Results Based on Today’s Fuel and Vehicle Technologies

Source: Argonne National Laboratory, Greenhouse Gases, Regulated Emissions, and Energy use in Transportation Model, Well-to-Wheel Calculator
https://greet.es.anl.gov/results
Alternative Fuel Benefits – Air Quality

Well-to-Wheels Emissions Impacts – Greenhouse Gases

Representative Results Based on Today’s Fuel and Vehicle Technologies

Source: Argonne National Laboratory, Greenhouse Gases, Regulated Emissions, and Energy use in Transportation Model, Well-to-Wheel Calculator

https://greet.es.anl.gov/results
Clean Cities National Clean Fleets Partnership

- Helps Large Private Fleets Significantly Cut Petroleum Use
- Provides Tools, Expertise and Technical Support to Incorporate Alternative Fuels and Fuel-Saving Measures
- Positions Partners as Pace-Setters for Others to Follow

More Than 25 Partners

More up-to-date information may be available. See the Clean Cities website: https://cleancities.energy.gov/fleets
WHERE ARE WE NOW AND WHERE ARE WE GOING??
Texas Coalitions’ Impact Over Last Decade

**Number of Alternative Fuel Stations**

- **193% Increase in Number Stations**
- **Petroleum Displacement:**
  - 18.5 Million in 2006
  - 55.9 Million in 2016
  - **202% Increase**

<table>
<thead>
<tr>
<th>Alternative Fuel</th>
<th>2007</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiesel</td>
<td>42</td>
<td>18</td>
</tr>
<tr>
<td>CNG</td>
<td>16</td>
<td>125</td>
</tr>
<tr>
<td>Ethanol</td>
<td>27</td>
<td>217</td>
</tr>
<tr>
<td>LNG</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>LPG</td>
<td>0</td>
<td>556</td>
</tr>
<tr>
<td>Electric</td>
<td>1027</td>
<td>0</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Number of Alternative Fuel Stations by Year:**
- **2007:**
  - Biodiesel: 42
  - CNG: 16
  - Ethanol: 27
  - LNG: 2
  - LPG: 0
  - Electric: 1027
  - Hydrogen: 0

- **2017:**
  - Biodiesel: 18
  - CNG: 125
  - Ethanol: 217
  - LNG: 19
  - LPG: 556
  - Electric: 0
  - Hydrogen: 1
Existing Alternative Fuel Network in Texas

Gaseous Alternative Fuel Locations and Designated Alternative Fuel Corridors

- Compressed Natural Gas (CNG)
- Propane (LPG)
- Designated Alternative Fuel Corridors
Existing Alternative Fuel Network in Texas

Electric Recharging Locations and Designated Alternative Fuel Corridors
Trending Now: Electric Vehicles

North Texas Electric Vehicle (EV) Registration Trends

As of November 8, 2017:
- Texas Registration: 11,325
- DFW Area: 4,474 (~40% of TX)

DFW Area #13 Metro Area Nationwide

*Based on VIN Decoding of DMV Registration Data. “Other EV” includes BMW i3, Chevrolet Bolt &Spark EV, Fiat 500e, Fisker Karma, Ford Focus Electric, and Mercedes B250e; “Other PHEV” includes BMW i8, Ford C-Max Energi & Fusion Energi

*Other - PHEV*
*Volt*
*Other - EV*
*Tesla*
*LEAF*
*MiEV*
# Texas’ Top 5 in EVs

<table>
<thead>
<tr>
<th>Counties</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travis</td>
<td>1,827</td>
</tr>
<tr>
<td>Harris</td>
<td>1,651</td>
</tr>
<tr>
<td>Dallas</td>
<td>1,636</td>
</tr>
<tr>
<td>Collin</td>
<td>971</td>
</tr>
<tr>
<td>Tarrant</td>
<td>939</td>
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</table>

<table>
<thead>
<tr>
<th>Cities</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin</td>
<td>1,496</td>
</tr>
<tr>
<td>Houston</td>
<td>1,043</td>
</tr>
<tr>
<td>Dallas</td>
<td>666</td>
</tr>
<tr>
<td>San Antonio</td>
<td>540</td>
</tr>
<tr>
<td>Plano</td>
<td>265</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Makes/Models</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tesla Model S</td>
<td>3,333</td>
</tr>
<tr>
<td>Chevrolet Volt</td>
<td>2,337</td>
</tr>
<tr>
<td>Nissan LEAF</td>
<td>1,580</td>
</tr>
<tr>
<td>Tesla Model X</td>
<td>1,221</td>
</tr>
<tr>
<td>Ford Fusion</td>
<td>1,000</td>
</tr>
</tbody>
</table>
GAINING MOMENTUM.....AND HOW DO WE GO FURTHER?
Alternative Fuel Sales Forecast

Percent of U.S. New Vehicle Sales
Passenger Vehicles (P) and Commercial Vehicles (C)

Keys to Further Adoption

Additional Refueling Infrastructure

Cost Reduction

State/Local Regulations
Local Partnerships: Clean Cities Coalitions

- Nearly 100 Local Coalitions
- 15,000 Stakeholders
  - 52% Private
  - 48% Public
- Nearly 500,000 Alternative Fuel Vehicles (AFVs)

A DOE Clean Cities Coalition Serving Central Texas
Clean Cities Portfolio

U.S. Department of Energy

Reduce

Fuel Economy

Eliminate

Idle Reduction

Replace

Biodiesel

Electricity

Hydrogen

Natural Gas

Propane

Ethanol
Clean Cities coalitions are locally based with the ability to tap national resources.
Potential New Alternative Fuel Corridors

- NCTCOG Metropolitan Planning Area
- Ozone Nonattainment Counties
- Corridors Designated by FHWA (2016)
- Potential TxDOT Submittal
- Additional NCTCOG Recommendations

Data Source: NCTCOG
Total Settlement to Date: $14.7 Billion

Zero Emission Vehicle (ZEV) Investment - Managed by Electrify America

Environmental Mitigation Trust (EMT) - Distributed to States

Settlement Breakdown ($ in Billions)

- Vehicle Buyback and Modification
- ZEV Investment
- Environmental Mitigation Trust

Texas’ Share: $209 Million
# Incentives for Alternative Fuel Vehicles

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Who</th>
<th>Amount</th>
<th>Incentive Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV, Hybrid, Natural Gas</td>
<td>Consumers</td>
<td>$3,500</td>
<td><strong>AirCheckTexas Drive a Clean Machine Program</strong></td>
</tr>
<tr>
<td>EV</td>
<td>Anyone</td>
<td>Up to $7,500</td>
<td><strong>Qualified Plug-In Electric Drive Motor Vehicle Tax Credit</strong></td>
</tr>
<tr>
<td>EV, Natural Gas, Propane</td>
<td>Anyone</td>
<td>$2,500</td>
<td><strong>Light-Duty Motor Vehicle Purchase or Lease Incentive Program</strong> Coming Soon</td>
</tr>
<tr>
<td>Natural Gas, Propane</td>
<td>Fleets</td>
<td>Varies Based on Vehicle Details</td>
<td><strong>Texas Natural Gas Vehicle Grant Program</strong></td>
</tr>
<tr>
<td>EV, Hybrid, Natural Gas, Propane, Hydrogen</td>
<td>Fleets</td>
<td>Up to 80% of Incremental Cost</td>
<td><strong>Texas Clean Fleet Program</strong></td>
</tr>
<tr>
<td>Any</td>
<td>Fleets</td>
<td>Various</td>
<td>Various “Clean Diesel” Programs from EPA or TCEQ TERP</td>
</tr>
</tbody>
</table>
# Incentives for Alternative Fuel Infrastructure

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Amount</th>
<th>Incentive Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any</td>
<td>Up to 50% Project Cost</td>
<td><strong>Alternative Fueling Facilities Program</strong></td>
</tr>
<tr>
<td>Electric</td>
<td>Up to 100% if Government-Owned; 80% if Non-Government Owned</td>
<td><strong>Volkswagen Settlement Environmental Mitigation Trust??</strong> <strong>Texas Plans To Be Determined</strong></td>
</tr>
</tbody>
</table>

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*U.S. Department of Energy*
National Resources on Alternative Fuels

Alternative Fuels Data Center (US Department of Energy)

www.afdc.energy.gov

- Technical Data
- Case Studies and Publications
- Tools
For More Information

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