Alternative Fuel & Electric Vehicles –
US/TN Data & ETCleanFuels Projects
Agenda

✓ Our members and partners
✓ National and Tennessee AFV and EV Data (fuel use, vehicles, growth)
✓ Actions for growing PEV use
✓ Developing DET chapters in Tennessee
✓ Winning DOE grants – setting TN as leader in DOE-CC program
✓ Projects
  ✓ DRIVE Electric USA
  ✓ DRIVE Electric USA #2
  ✓ EMPOWER Project
✓ Driving school districts to the EPA $5 billion – “TN Achieves”
✓ Other partnerships & efforts
✓ Don’t miss the first ever Drive Electric TN “Momentum Summit”
Our Members

This includes both Tennessee Clean Fuels and Drive Electric TN members.
Clean Cities Alternative Fuel Vehicle Inventory

Source: Clean Cities coalitions annual activity reports
In 2020 alone, coalition projects resulted in a cumulative impact in energy use equal to 740 million gasoline gallon equivalents by using alternative fuel vehicles. *Source: Clean Cities Coalitions 2020 Activity Report*

*EVs include all-electric vehicles and plug-in hybrid electric vehicles, but not hybrid electric vehicles.*

This includes both Tennessee Clean Fuels and Drive Electric TN members.
2021 NGV Fuel Use
610 Million GGE Total

In 2021, 64% of all on-road fuel used in natural gas vehicles was RNG

- Conventional Natural Gas
  220 Million GGE

- Renewable Natural Gas
  390 Million GGE

RNG Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>RNG GGE</th>
<th>RNG EGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>166.2</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>242.6</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>305.3</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>404.4</td>
<td></td>
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<tr>
<td>2021</td>
<td>568.7</td>
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Comparative GHG Emissions from Passenger Cars running on Different Fuels

![Graph showing comparative GHG emissions from different fuels.]

- Gasoline
- Diesel
- LPG
- Natural Gas (EU-RX)
- Biomethane (from maize)
- Bioethanol
- Biopropylene
- Ethanol
- Biodiesel
- Hydrogen

Based on:
- 2.2 kg CO₂ per liter of gasoline
- 2.6 kg CO₂ per liter diesel

Categories:
- Fossil Fuels
- Bio Fuels
- Electronic Motors

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National
National Level – Alt. Fuel Stations

Stations = ALL

All maps from the AFDC Station Locator: https://afdc.energy.gov/stations/#/find/nearest

Stations = Electric
National Level – Alt. Fuel Stations (cont’d)

Stations = CNG (Compressed Natural Gas)

Stations = LPG – Propane Autogas

RNG = Renewable CNG or LNG

Renewable Propane
National Level – Alt. Fuel Stations (cont’d)

Stations = E-85 ethanol

Stations = B-20 biodiesel

Both E85 and B20 are great choices if you care about GHG emission reductions!
ET+MWT GGE Reductions by Fuel/Tech.
Tennessee – PEV Registrations and Growth
Tennessee’s EV Growth – Recent History

<table>
<thead>
<tr>
<th></th>
<th>12/31/19</th>
<th>12/31/20</th>
<th>12/31/21</th>
<th>% change – ‘19 - ‘20</th>
<th>% change – ‘20 - ‘21</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEVs (battery EVs)</td>
<td>5,911</td>
<td>6,953</td>
<td>11,277</td>
<td>18%</td>
<td>62.0%</td>
</tr>
<tr>
<td>PHEVs (plug-in hybrid EVs)</td>
<td>3,749</td>
<td>4,081</td>
<td>5,625</td>
<td>9%</td>
<td>29%</td>
</tr>
<tr>
<td>Totals = PEVs (plug-in EVs)</td>
<td>9,660</td>
<td>11,084</td>
<td>16,902</td>
<td>15%</td>
<td>52%</td>
</tr>
</tbody>
</table>

✔ Tennessee’s and DET’s collective goal for EVs is **200,000 on our roads by 2028**

✔ Actual needed growth rate to reach 200,000 goal by 2028 is higher; MUST continue nonlinear growth rate. If we doubled number of BEVs every year, would hit 192,000 in 2029.

✔ Just looking at Jan. 1 – June 30, 2022, we have seen a 24% increase in the BEV numbers (14,002)
Actions to Increase TN PEV Numbers

- Development of partnership **Drive Electric TN**
  - *Three Working Groups started in 2019 to address EV adoption barriers (Infra., Awareness, Policy & Pgms)*
  - *Development of more community EV chapters that hold educational events, and increasing local involvement in them*

- Local Power Companies (LPCs) learning and developing incentives *(alone and via multiple partnerships)*

- Amazing work done by **TDE&CD and partners to bring LOTS of clean-energy jobs to TN via EV, battery and related-component manufacturing**

- Effective fed. funding mgmt. and **addition** of more funding from TVA and TDOT (millions) to expand infrastructure for both DCFC and Level 2 across multiple needs

- **Fleet engagement – leaders developing or being developed (e.g., TVA, Nash., Chatt., Memphis)**

- All kinds of partners (e.g., TVA, LPCs, ETCleanFuels, universities, TDEC, local citizens) developing projects and programs focused on EV research, engagement, and deployment
Tennessee – DET Chapters

- Drive Electric
  - Upper West Tennessee
  - Nashville
  - Clarksville
  - Upper Cumberland
  - Appalachian Highlands
  - Gateway to the New South
  - Smoky Mountains
  - Scenic City

- Nearing sustainability, complete 4Q 2022
- Startup phase, sustainable 2Q 2023
- Planning phase, sustainable 4Q 2023
- Potential chapter, TBD
Bringing DOE Funds into Tennessee

Clean Cities Coalitions Involved in FY20 TI Awards

Clean Cities coalitions will play a key role in the success of these awards.
- 32 Clean Cities Coalitions involved in projects*
- Representing 26 States

*Based on pre-negotiated project information. Project partners may change.

FY20 TI Awards: $37M for 18 Projects

Topic Areas and # of Projects
- Gaseous Fuels Technology Demonstration (2)
- Alt. Fuel Proof-of-Concept in New Communities and Fleets (8)
- EV and Charging Community Partner (3)
- TI Open Topic Projects (5)

This excludes the EMPOWER project and $3M+ that will flow through ETCleanFuels 2022-2024.
DRIVE Electric USA

Partnership across 14 states to develop statewide, branded EV initiatives nationwide. Project started with intent to grow the involvement by other states and seek additional funding.

1. ETCleanFuels is the Prime
2. Clean Cities coalitions leaders that partner with electric utilities, state agencies, NGOs, municipalities and more to develop sustainable partnerships to advance EV efforts into the foreseeable future

www.DRIVEElectricUSA.org
DRIVE Electric USA

Seven “Priority Areas” of work that each state is undertaking:

1) Building **statewide, branded initiatives** – *Develop a statewide Roadmap or Plan*
2) **Consumer Education & Chapter Development**
3) **Engaging Electric Utilities & Regulators**
4) **EV Charging Infrastructure and Planning**
5) **Educating State & Local Government Officials**
6) **Dealer Engagement** – *Develop “Certified EV Dealer” Programs*
7) **Engaging Fleets & EV Adoption**

[Weblink: www.DRIVEElectricUSA.org]
DRIVE Electric USA “2”

Partnership across 14 states to develop statewide, branded EV initiatives nationwide. Project started with intent to grow the involvement by other states and seek additional funding.

1. 14 original states – gray
2. 12 states currently included in DEUSA2 - colors

Project is being converted into a Program by seeking external funding for long-term development across even more states.
EMPOWER

Build a nationwide, sustainable Workplace Charging Program

Map of partner states and communities >>>

Most CC-inclusive project DOE-CC has ever seen!

EMPOWER = “Equitable, Mobility Powering Opportunities for Workplace Electrification Readiness”

Danniel Siksay
Chief of Staff, East Tennessee Clean Fuels

Madelyn Collins
Project Manager, East Tennessee Clean Fuels
1. **Partners, Process**
   a) Significant partners include Clean Cities coalitions across the country, and many utilities
   b) Coalitions will work with partners in their area – like utilities – to reach directly out to employers in 30 states

2. **Goals:** By end of Year 3, have signed up 3,500 workplaces that have committed to install workplace charging equipment, and have 650 completed installations
   >>> In TN, that equals 80 workplaces reached, 25 installs

3. **Strong Energy & Environmental Justice component:** 40% of all outreach must occur within underserved communities or at employers that benefit those communities
2022: EPA Clean School Bus Program

Savannah Robertson
DriveElectricTN Coordinator, East Tennessee Clean Fuels

Leland Davidson
Project Manager, East Tennessee Clean Fuels
Medium-Duty eTruck Project

Allow fleets in TN to borrow a class 4 all-electric box truck for up to two months

Rural Reimagined

Service to underserved communities by demonstrating EVs & developing infrastructure plans

Rural EV Testbed

Upper Cumberland area focused project offering two-week EVs test drives, working on community education events, and installing Level 2 infrastructure in rural counties
OTHER EFFORTS, PROJECTS

FHWA – NEVI State Plan
TDOT & TDEC crafted Plan;
ETCleanFuels & TDOT developing criteria for evaluating sites for funding

Green Fleet Planning
ETCF leads partnership across major cities in TN to review fuel use and GHGs as a team & make plans for adding cleaner vehicles

National Alt. Fuel Corridor Council
TN and AL Clean Cities manage nationwide CC + state DOT reps discussions about FHWA corridors – planning for corridor ID and wayfinding signage, and filling alt-fuel gaps

EV Community Preparedness
The NFPA and 30 Clean Cities coalitions helping many communities prepare for the EV revolution

Ainsley Kelso
Communications Coordinator, East Tennessee Clean Fuels
Fleet Examples in Tennessee

1. Hawkins County Schools starting a new propane school bus program (through state DERA funds)

2. Knoxville now has renewable propane efforts moving forward with plans for almost 30 propane-powered vehicles by end of 2023!

3. Chattanooga acquiring MD and HD AFVs: 4 propane, 2 CNG, and 1 class 5 all-electric tire truck, plus all the necessary infrastructure!

4. Middle Tennessee Electric providing great leadership in developing plans and programs to expand EV education in their footprint; includes Wilson, Cannon, Rutherford and Williamson Counties.

5. Metro Nashville – plan to have 25% of fleet EV by 2030; 59 EVs ordered in 2022!

6. Clarksville-Montgomery County School System now up to 74 of their 350 school buses running propane autogas!

7. Shelby County received DOE grant and is acquiring 4 Ford Lightnings in Roads & Bridges Dept., plus Level 2 and DCFC infrastructure for charging

8. Paris BPU becoming partner to help work on EV furtherance across multiple counties

9. Metro Nashville – plan to have 25% of fleet EV by 2030; 59 EVs ordered in 2022!

Kingsport now has over 100 propane vehicles, handful of Nissan Leafs and has provided public L2 for city for years

Greeneville now has almost 90% of police vehicles on propane, plan to go almost 100%
Tennessee’s Drive Electric License Plate Campaign

1,100 people signed up at start, thanks to TVA covering plate cost!

Waiting on production of the plates; expected in next two months.
STFE & Momentum Summit

Don’t miss it!

Being held at UTK
Student Union!!

We are taking over
management of STF&E
while holding our first
ever DET Momentum
Summit.

Register here:
stfe2022.eventbrite.com
Thank You!

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