

GAZETTE

DRIVING THE WAY TOWARD
ENERGY INDEPENDENCE

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Pittsburgh Region Clean Cities was joined by the Electrification Coalition and MC ElectraPark (Philadelphia) for its Capitol Hill day visits, including this stop outside John Fetterman's office. (Photo credit: PRCC)

PRCC ENGAGES PA LEGISLATORS DURING CAPITOL HILL DAY VISITS

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Pittsburgh Region Clean Cities (PRCC) joined with over 25 other Clean Cities coalitions in Washington D.C. for Transportation Energy Partner's annual Energy Independence Summit, February 12 - 14th. The event marked the 18th year of collaborations in the nation's Capitol on clean transportation initiatives.

CLEAN CITIES UNVEILS NEW NAME AND LOOK:



**Clean Cities and
Communities**

The U.S. Department of Energy's Vehicle Technologies Office (VTO) is excited to unveil a new name and look for Clean Cities as the national network moves into its fourth decade of advancing clean transportation!

The new name, [Clean Cities and Communities](#), conveys the diversity of areas coalitions serve, and the new logo also represents how coalitions work at the intersection where community, the environment, and technology come together to ensure clean transportation technologies benefit people.

The updated branding also better emphasizes that each Clean Cities coalition is a U.S. Department of Energy designated coalition in the Clean Cities and Communities partnership. Our promise is to passionately and tirelessly champion the deployment of clean transportation technologies and support communities with collaboration, expertise and resources.

[Watch an announcement by Austin Brown](#) from the U.S. Department of Energy's Vehicle Technologies Office.



*PRCC's Executive Director Rick Price and Board Member William Sapon ride the trolley between the Senate and House buildings on Capitol Hill
(Photo credit: William Sapon / PRCC)*

Participants in the Summit experience a full day of learning and engaging with industry leaders in preparation for a Capitol Hill day of visits with State legislators to advocate for clean fuels and vehicle technologies. The event ends with roundtables with several federal agencies, including the Department of Energy, the Department of Transportation, the Environmental Protection Agency and others.

This year, PRCC met with Staff from Senator Casey's and Senator Fetterman's offices as well as House Representatives Kelly, Thompson and Boyle. Conversations focused on leveraging clean fuels to insulate Americans from volatile gas prices, reducing foreign oil dependence, transitioning to zero-emission vehicles and decarbonized fuels, and building the American workforce to support an equitable energy transition. The group asked legislators to continue to support the Clean Cities program, to maintain the suite of existing tax incentives for 10 years and to continue energy programs under the BIL and IRA.

DEPARTMENT OF ENERGY (DOE) ANNOUNCES \$32.5 MILLION IN FUNDING TO ADVANCE TRANSPORTATION ELECTRIFICATION

In January, the Department of Energy (DOE) announced the selection of 16 projects totaling \$32.5 million to advance technology integration in areas critical to achieving net-zero greenhouse gas emissions in the transportation sector. Spanning nine states and Washington, D.C., the selected projects will focus on expanding electric vehicle (EV) deployment and supporting EV charging infrastructure by reducing installation costs, educating consumers, and implementing regional deployment. The funding supports strategies detailed in the [U.S. National Blueprint for Transportation Decarbonization](#), and the Biden-Harris Administration's whole of government approach to reaching a fully decarbonized, clean transportation future that benefits all Americans.

"DOE is committed to investing in clean energy technologies critical to decarbonizing our transportation system," said Jeff Marootian, Principal Deputy Assistant Secretary for Energy Efficiency and Renewable Energy. "This funding supports projects that embody our transformative approach to achieving a clean, safe, secure, and accessible mobility system that benefits Americans in every part of the country."

Funded through DOE's [Vehicle Technologies Office \(VTO\)](#), in the Office of Energy Efficiency and Renewable Energy, the selected projects are expected to:

- Reduce EV infrastructure soft costs across the nation;
- Increase consumer familiarity with EVs and their benefits;
- Demonstrate and deploy novel clean transportation solutions, including electric construction vehicles and school buses;
- Provide regional clean transportation outreach, education, and training for underserved communities.

As part of the Biden-Harris Administration's commitment to ensuring the benefits of a clean transportation system are shared equally, this funding sought the participation of underserved communities and underrepresented groups. Applicants were required to submit a Diversity, Equity, and Inclusion Plan that described the actions taken to foster a welcoming and inclusive environment, support people from underrepresented groups in STEM, and advance equity.

Selection for award negotiations is not a commitment by DOE to issue an award

or provide funding. DOE and the applicants will first undergo a negotiation and DOE may cancel award negotiations and rescind the selection for any reason.

Learn more about the [selected projects](#) and other work funded by the [Office of Energy Efficiency and Renewable Energy](#).

Clean Cities coalitions will play a significant role in the success of these projects. Projects include collaboration with over 40 Clean Cities coalitions spanning over 30 states across all 7 Clean Cities Regions.

For example, DOE's \$5M investment in Plug-In America's PlugStar Consumer EV Education Campaign will accelerate equitable EV adoption at scale in partnership with 23 Clean Cities coalitions across 18 states. This announcement also includes 7 projects totaling \$7.4 million for Clean Cities coalitions providing communities outreach, education, and training to foster broader adoption of clean transportation. These projects include regional Clean Cities coalition collaborations across the Midwest, Southeast, Mid-Atlantic, Intermountain West, Northern California, and the Great River Corridor. Through the open topic, DOE also announced projects that will demonstrate innovative electrification technologies like cargo trikes, snow plows, and non-road construction equipment with active

collaboration from Clean Cities coalition partners.

Projects will also reduce infrastructure "soft costs" associated with EV charging installation, such as costs associated with permitting, siting, and installation. The 3 projects selected totaling \$15.5 million in DOE funding would enable swift deployment of lower-cost EV charging infrastructure, including in underserved communities.

Pittsburgh Region Clean Cities anticipates being a part of four projects that were selected by the DOE for support. These projects include:

- Plug-In America's PlugStar Consumer EV Education Campaign to accelerate equitable EV adoption;
- Pennsylvania Department of Transportation (PennDOT)'s demonstration and deployment project focused on electric construction vehicles;
- World Resources Institute (WRI)'s outreach, education and training project on Equitable Electric School Bus Adoption, featuring Clean Cities Coalition Electric School Bus Academies; and
- a partnership project through James Madison University to pursue expansion of the Mid-Atlantic Region Clean Cities Programs.

"We are excited to be a part of so many progressive and collaborative efforts selected by the DOE," said PRCC's Executive Director Rick Price.

NEW FUNDING ENHANCES EV CHARGING RESILIENCY, RELIABILITY, EQUITY and WORKFORCE DEVELOPMENT

The Joint Office of Energy and Transportation has made available \$46.5 million from President Biden's Bipartisan Infrastructure Law for projects that bolster America's electric vehicle (EV) charging infrastructure. The 30 projects across 16 states and Washington, D.C. will ensure convenient and efficient EV infrastructure for drivers; accelerate a resilient national EV charging network; grow the clean energy workforce; extend the benefits of clean transportation to rural, urban, and tribal communities; and validate real-world performance and reliability of high-power EV chargers.

The available funding will also address barriers to charging in multifamily housing facilities, explore new approaches to curbside charging in urban areas, promote seamless connections across modes through e-mobility hubs, and test new incentive structures to provide affordable public charging access.

"The Joint Office of Energy and Transportation is proud to fund these game-changing clean transportation projects in communities across the country," said Gabe Klein, Executive Director of the Joint Office. "These investments ensure we can meet unique local needs, create good-paying jobs, innovate new business models,

test products thoroughly, and work towards our goal of making it easy for everyone to ride and drive electric."

The number of EVs on America's roads has more than quadrupled since President Biden took office and these investments will be a crucial part of the Administration's goal of building a national network of 500,000 public EV charging ports by 2030 and reaching net-zero emissions by 2050.

A full list of the awards increasing charger reliability, advancing new business models for electrified shared mobility and fleet-based services, and supporting underserved communities through new jobs and training resources is available at driveelectric.gov.

PRCC is expected to participate the Team-based Evaluation, Surveying & Training (TEST) for Real-World Charging Project to establish a national baseline for the state of electric vehicle charging, in terms of user experience. It will employ potential workforce individuals to receive training and complete assessments of current EV infrastructure. From these rich data points a training program for State DOT's will be developed and launched online and in-person intending to be used nationwide.

IDLING REDUCTION FOR GREATER EFFICIENCY AND ENVIRONMENTAL SUSTAINABILITY:

By Divya Singh

Reducing vehicle idling is a crucial step towards environmental sustainability and economic efficiency. Idling, the act of running a vehicle's engine when it's not moving, is more than just a waste of fuel; it contributes significantly to air and noise pollution, increases engine wear, and leads to unnecessary carbon emissions. The [U.S. Department of Energy's IdleBox Toolkit](#) and efforts by various organizations highlight the importance of idling reduction across different vehicle types, from personal vehicles to heavy-duty trucks and locomotives.

Idling consumes over 6 billion gallons of fuel annually in the U.S., costing over \$20 billion. This substantial waste underscores the need for both behavioral changes and technological advancements to curb the practice. For personal vehicles, the solution is

straightforward: turning off the engine during prolonged stops can save fuel and reduce emissions. Modern vehicles are designed to minimize the need for idling, with many featuring stop-start technologies that automatically shut off the engine when the vehicle is stationary.

For medium- and heavy-duty vehicles, including trucks and locomotives, the approach to reducing idling is more nuanced. The U.S. Department of Energy and Argonne National Laboratory have led research into idling reduction, offering tools and studies to help drivers and companies find effective strategies. Technologies such as auxiliary power units, automatic engine shut down/start up systems, and shore connection systems offer alternatives to idling, providing the necessary power for vehicle operations without the environmental toll.

In addition to technological solutions, policy and educational efforts are vital. Many states and municipalities have implemented anti-idling laws, and federal incentives encourage the adoption of idling reduction measures. Educating drivers and fleet managers about the benefits of idling reduction, as well as the availability of efficient technologies, is key to changing behavior.



THANK YOU FOR NOT IDLING

According to Argonne National Laboratory research:

- ▶ Idling uses more fuel than does restarting your car.
- ▶ Unless you're driving a clunker, your vehicle will restart.
- ▶ You will not wear out the starter.
- ▶ Idling a car wastes about 0.3 gal/h and a big truck about 1 gal/h.
- ▶ Each gallon of fuel burned emits about 20 lb. of carbon dioxide.
- ▶ In some locations, idling is illegal and can result in substantial fines.
- ▶ Idling gets you nowhere!

The impact of idling extends beyond fuel waste and emissions. In national parks and communities, vehicle emissions from idling can deteriorate air quality and public health. Programs like the Clean Cities National Parks Initiative demonstrate a commitment to reducing idling in sensitive areas, preserving natural resources, and ensuring cleaner air for visitors and wildlife.

Ultimately, reducing idling is a collective effort that requires awareness, technology, and policy support. By adopting idling reduction measures, we can improve air quality, conserve energy, and save money, contributing to a more sustainable and healthier environment for future generations.

NEW EV FRIENDLY PLANNING RESOURCES FOR STATE AND LOCAL GOVERNMENTS

The AFDC now features online resources to help state and local governments proactively plan for EV infrastructure by making their jurisdiction EV friendly. The content includes resources on EV infrastructure planning and charger equipment codes and standards, as well as best practices to navigate regulatory updates to facilitate infrastructure rollout, includ-

ing building codes, zoning ordinances, and permitting. These resources can help local and state government departments understand the role they can play in developing strategic plans to support EV adoption and streamline approval processes for EV charger projects. Visit the new [EV Planning Resources Page](#) on the AFDC today!

GASP SEEKS INPUT ON ENVIRONMENTAL JUSTICE SURVEY

Local air quality organization GASP is taking on the work of building a more diverse, equitable, and inclusive organizational culture.

As part of their commitment to this work, they have developed a survey aimed at gaining a deeper understanding of how groups in Environmental Justice Communities are engaging with GASP. The goal is to discover what practices are working well while also identifying areas for improvement.

If you reside or work in an Environmental Justice Community as defined by the Department of Environmental Protection and you have a history of involvement with GASP, please take the survey! Your feedback will not only help enhance local operations but also strengthen GASP's programmatic work collaborations with EJ communities.

[Access the survey here.](#)

Please complete the survey by **Friday, March 1st** to ensure your input is included in the analysis. This survey should take between 5-20 minutes to complete.

CMU ENERGY WEEK TO EXPLORE TRANSPORTATION DECARBONIZATION

On March 19-21, the Wilton E. Scott Institute for Energy Innovation marks Energy Week - a three day conference to combine forces and exchange ideas on the best paths to decarbonizing transportation.

The free event features an Energy Industry Career Fair for students, keynote and moderated panel sessions with industry leaders, a student research poster competition, the Cleantech Investor Forum, the CMU Energy Showcase, tons of networking and more!

Conference Sessions will focus on decarbonizing both community and freight solutions as well as strategies to decarbonize with equity and access. Rachael Nealer, Deputy Director of the Joint Office of Energy and Transportation will deliver the conference keynote presentation on Wednesday, March 20th. PRCC collaborators and board members are among the list of highlighted speakers, including Sean Qian, CMU Professor; Erin Russel-Story, Clean Cities Regional Manager with the National Energy Technology Laboratory; Katherine Kelleman, Pittsburgh Regional Transit; and Chris Sandvig, PRCC Board Member and Executive Director for Mobilify Southwestern PA. For the full agenda and to register by March 4th, please visit the [conference website](#).

UPCOMING EVENTS:

Electrify Allegheny Program KickOff

March 12, 2024
10 a.m. - 11 a.m.

GreenGov Council & Penn State Sustainability Webinar Series - Sustainable Transportation - PA Turnpike

March 15, 2024
1:00 - 2:00 p.m.

CMU Energy Week - Transportation Decarbonization

March 19-21, 2024
Cohon University Center (2nd Floor)

BOARD OF DIRECTORS MEETING SCHEDULE FOR 2024:

March 6, 2024 @ DLC
May 1, 2024
July 10, 2024
September 4, 2024
November 6, 2024

10:00 a.m. - 11:30 a.m.

THREE RIVERS EVA CLUB MEETINGS:

March 16, 2024
April 20, 2024
10 a.m. @ Laird Hall, Murrysville

For details, contact Jonathan and Bonnie Belak, 724-387-8210.



TRAINING COURSES:

PRCC joins the National Alternative Fuels Training Consortium and the Community College of Allegheny County - West Hills Center in offering training classes.

This year, we are expanding our curriculum offerings focused on alternative fuels and we'd love to hear from you!

Please join us for our upcoming course offering:

Hands-On Workshop: Propane & Natural Gas Vehicles

March 27, 2024
10 a.m. - 12 p.m.
CCAC-West Hills Campus
[Register](#)

To register for these classes, contact Bob Koch at 412-788-7378 or rkoch@ccac.edu.



UPCOMING CONFERENCES:



Work Truck Week
March 5-8, 2024
Indianapolis, IN

For those who design, build, use and maintain work trucks, see the industry's latest products & technology, learn together & discuss the future.

[Learn More](#)



NAFA 2024 Institute & Expo
April 22-24, 2024
San Antonio, TX

Join the industry's largest gathering of fleet and mobility professionals to share insights and perspectives on the many facets of the fleet professional's day-to-day responsibilities and strategic leadership roles. Gain tools, resources, and knowledge needed to maximize your fleet operations.

[Learn More](#)



Advanced Clean Transportation Expo
May 20-23, 2024
Las Vegas, NV

Uniting the transportation sector in efforts to reduce emissions from goods movement, the service industry, and passenger transportation. Learn about the latest technologies, services, and vehicles driving the transition to low- and zero-emission transportation solutions.

[Learn More](#)

THE PUSH TO GO GREEN - CHOOSING THE BEST ALTERNATIVE FUEL FOR YOUR SCHOOL BUS FLEET

By Shane Johnson, Chief Operating Officer, Palmer Bus Service

Originally published in the January 2024 edition of the School Transportation Association newsletter.

Palmer Bus Service Inc., a family-owned school bus contractor, is setting a new standard of going green by piloting the first school bus in Minnesota to use the Demi- NeuFuel school bus platform. Aptly branded as the “CowFartBus,” the technology will enable the school district to power buses using renewable natural gas (RNG) which reduces greenhouse gas (GHG) emissions by over 85%.

Palmer Bus, which serves multiple Minnesota-based school districts, outfitted two diesel school buses with Ingevity’s NeuFuel low-pressure adsorbed natural gas system, a technology that enables the use of a small, low-cost fueling appliance, and American CNG’s DEMI Diesel Displacer system. The Demi-NeuFuel-powered buses run on diesel and RNG blend that ensures no disruption to operations throughout the school day and no compromise to the vehicle



Ingevity's NeuFuel system and American CNG's DEMI Diesel Displacer system enable existing diesel school buses to run on a blend of diesel and RNG. (Photo credit: Ingevity)

functionality, range or performance.

“The DEMI-NeuFuel system is aligned with our focus on operational excellence and environmental stewardship by offering a cost-effective platform to reduce fuel costs and emissions as well as providing a solution for our in-service diesel school buses where one previously did not exist,” said Shane Johnson, Chief Operating Officer of Palmer Bus. “We are excited with this technology and the early results we are experiencing.” Alternative fuel options have been available for the school bus industry for many years, however on a relative cost-basis, the renewable natural gas solution allows for conversion of 26 existing in-use diesel school buses to 1 new BEV bus or 12 RNG buses to 1 new propane powered school bus, all with very limited infrastructure required.

“Both Ingevity and American CNG share in Palmer Bus’ passion to bring to market a solution that protects the environment while providing greater operational efficiencies and without vehicle or fleet compromise,” said Russell Schindler, Sales and Business Development Manager with Ingevity’s NeuFuel team. “We are proud to have the opportunity work with industry thought leaders and include Palmer Bus Service alongside our other nationally-recognized fleet partners embracing RNG as transportation fuel.”

About Palmer Bus:

Palmer Bus began in St. Clair, MN in 1974, with 8 buses and a dream. It is a family owned and operated business that has grown over the years with the hard work and commitment of many individuals. Palmer Bus Service is committed to our Purpose and Core Values. Palmer Bus Service provides student transportation to approximately 30 districts across the state of Minnesota.

For more “information, reach out to shanej@palmerbuservice.com. For additional information on the DEMI-NeuFuel (aka the "CowFartBus") reach out to russell.schindler@ingevity.com.



DOMINION ENERGY SELECTS INNOVATIVE RAIL TECHNOLOGIES FOR BATTERY-ELECTRIC LOCOMOTIVE PROJECT AT FORT CAVAZOS

Dominion Energy has been designated as the leader of a project funded by the Texas Military Preparedness Commission to improve energy resiliency for rail operations at Fort Cavazos, Texas. Dominion Energy has selected Innovative Rail Technologies (IRT) to provide its ATLAS lithium-ion battery-electric propulsion system for the initiative. The project was the top-scoring proposal chosen for funding and will result in the conversion of one of the U.S Army's diesel locomotives to battery electric.

The project provides Fort Cavazos not only with a cost-effective way to update and expand mission capabilities of one of its aged legacy diesel locomotives with IRT's state-of-the-art ATLAS propulsion technology but also to collaborate with the electric utility service provider, federal, state, and local government officials on base readiness, infrastructure resilience, community coordination, and environmental justice objectives. The

battery system on ATLAS locomotives is capable of providing a significant source of back-up power during emergency events, including cyber-attacks, providing an additional layer of operational readiness.

"The Dominion Energy Fort Cavazos Team is looking forward to partnering with Innovative Rail Technologies on this extremely significant electric locomotive switcher project. Having the opportunity to partner on a project that brings this capability to Fort Cavazos, the Army and Department of Defense is outstanding. The environmental, reliability and cost savings benefits this is going to bring will be more than innovative – it can be a game changer," said Kevin M Mann, Dominion Energy's Manager of Privatization – Fort Cavazos.

IRT is expected to begin the rebuild of the Fort Cavazos locomotive immediately and deliver it to Fort Cavazos by the end of 2024.

About Innovative Rail Technologies

Innovative Rail Technologies (IRT) is a rail solutions provider offering its proprietary technology ATLAS (Advanced Technology Li-Ion Adaptive System). ATLAS is a turnkey, scalable propulsion and control package customized to the unique needs of customer operations. Paired with automated, high-speed charging, IRT's ATLAS-powered locomotives maintain 24/7 availability for its operators in an economically beneficial package. IRT was established in 2019 and has a rapidly expanding list of customers which includes Fortune 500 companies, Ports, Industries, and Short Line Railroads. IRT works with its growing nationwide network of locomotive remanufacturers (ATLAS Authorized Installers) and can also provide ATLAS kits directly to customers for in-house remanufacture. More information about the company can be found at: www.InnovativeRailTech.com.



*IRT's battery-powered locomotive at U.S. Steel.
(Photo credit: Pittsburgh Tribune Review)*



*Propane school buses are a great, viable option for colder climates.
(Photo credit: ROUSH Cleantech)*

PROPANE SCHOOL BUSES LOVE COLD WEATHER

With millions of Americans facing sub-zero temperatures this winter, school systems need reliable transportation that operates well in cold weather.

Cold Weather Performance

Cold weather should not be a constant barrier to getting children to and from school. Thankfully, the 1,000+ school districts operating propane school buses are consistently and seamlessly transporting 1.3 million students to school safely every day — even in the harshest of conditions.

In the Blue Bird Vision Propane school bus, propane remains in a liquid state until it reaches the cylinder. This cutting edge technology alleviates cold-weather start issues associated with

vapor technology propane systems of the past. In fact, the new fuel system provides for unaided cold weather start ups to minus 40 degrees Fahrenheit.

Transportation directors across the country and in Canada share that, in cold weather conditions, buses fueled by propane autogas start and operate better than their diesel and EV counterparts, where the fuel may gel or range may be compromised. Let's see how districts in the coldest parts of North America are faring with propane school buses.

Howard-Winneshiek School District, Iowa

Howard-Winneshiek Community School District in Cresco is located in

Community

northeast Iowa. The district's school buses travel up to 15,000 miles each per school year on long rural routes. The weather can be extreme, with cold-weather months of negative 30 degree temperatures and abundant snowfall. The district's fleet consists of nine propane buses and 23 diesel models.

"Our propane buses perform flawlessly," said Director of Transportation Brian Swestka. "They warm up substantially quicker than our diesel buses. The propane buses are ready to go in just a few minutes compared with 20-30 minutes for diesel to warm up."

For the school district's diesel buses to operate during the winter months, the maintenance crew plugs the engine block heater to an electrical outlet at night, costing both time and money. This is not needed for the propane buses.

"Every time we do any type of service, it costs us money. Propane buses require less maintenance than our diesel buses, and that means lower costs," added Swestka, who said the school district's yearlong data showed the average cost per mile for its propane buses to be about 60 percent lower than its diesel buses.

Cost savings benefit the school district, but the biggest difference for the drivers and the passengers has been

the warmer and quieter performance of the propane buses. On very cold days, the school district's diesel buses often don't get warm enough to get to a comfortable temperature inside the bus, which is not the case with the propane models. Also, the school district's drivers can hear traffic around the propane buses better and hear the students inside the bus with more clarity.

Brandon School Division, Manitoba, Canada

Brandon School Division in Manitoba covers a landscape containing both urban and rural areas. Temperatures average in the mid-80s in the warmer months, and down to negative 35 degrees Fahrenheit in the colder months, with wind chills as low as negative 60. Average yearly snowfall is 40 inches. Its school bus fleet is made up of 12 propane buses and 31 diesel buses.

The propane buses have performed consistently for the school district. "We get temperatures from extreme cold to quite hot, and there is no change in how the propane bus performs, which is consistently great," said Supervisor of Transportation Ron Harkness.

Prior to purchasing its first propane bus, the school district tested a demo propane bus for its cold-weather performance. It found that the demo bus did not need to be plugged into

block heaters and that they started right up. The diesel models are always kept plugged.

The drivers are equally impressed with the propane buses. “The propane buses heat up quickly, which our drivers appreciate,” said Harkness. “The student and driver comfort is fantastic. Students even need to tell the drivers to turn the heat down — that never happens with the diesel buses.”

Proctor Public Schools, Minnesota

Proctor Public Schools in Proctor, Minnesota, operates a school bus fleet of 30 with nine Blue Bird Vision Propane buses. The buses travel rural and mountainous terrain. Nearly three-quarters of the area is serviced by gravel roads and the elevation significantly changes throughout the district. During the summer, temperatures reach into the 90s, with temps dipping to as low as negative 30 degrees during the winter with negative 50-degree wind chill. Average snowfall is 75 inches annually.

Transportation Supervisor Curt Benassi has found that his propane school buses are outperforming their diesel buses in these conditions. “When it’s cold out, our diesel buses take forever to warm up and we need to check them to see if they work,” Benassi said. “Even when it’s 40 below, our propane buses start up with no trouble and no additional time needed.”

Benassi says that on cold days lower

than 20 degrees, his maintenance crew must dump fuel conditioner into the diesel fuel to avoid it from being turned into a wax. Each bottle of condition fuel is \$9 per bus per time. Sometimes in the district’s diesel buses, a block heater doesn’t work to warm up the antifreeze, and they can’t use the bus. He often has diesel buses that don’t start up due to cold weather. In comparison, Proctor Public Schools’ propane buses do not need fuel conditioner or electric block heaters to start.

The school district’s school bus drivers and students also benefit from the ability of the propane buses to start up and stay warm inside the cabin. “Our drivers love how warm the propane buses get,” said Benassi. “From front to back, the temperature remains at a consistent 70 degrees. Students sometimes tell the driver to turn the heat down, which never happens in diesel. Compare that to the front of the diesel bus that might be only 30 degrees — throughout the entire bus route. Drivers often cover themselves with blankets in diesel buses, and, on extremely cold days, almost all of the floor is covered with frost during the route.”

During cold-weather months, propane school buses across North America are proving to perform consistently and economically at temperatures well below zero, satisfying drivers, students, technicians, parents and district leadership.



*Propane offers many attractive attributes as a cleaner fuel for the future.
(Photo credit: FuelsFix)*

PROPANE: AN UNDERRATED FUEL OF THE FUTURE

By Cameron Farid, sophomore mechanical engineering student at Princeton University

While EVs bask in the spotlight of an energy transition, they cast a shadow on other fuels that can help offset conventional diesel and gasoline usage. Propane, a staple in many American households, is one of these underdog fuels. Propane, or liquified petroleum gas (LPG), is an energy-dense gas produced as a byproduct of natural gas processing and crude oil refining. It is typically stored as a liquid under pressure in tanks, powering appliances like grills, furnaces, and water boilers. However, as will soon be revealed, its abilities extend far beyond smoking burgers on a Sunday afternoon.

Affordable costs, abundant supply, and performance benefits suggest that propane, much like electrification, can help modernize America's transportation sector.

The transportation sector is undergoing a shift from conventional gasoline and diesel to alternative fuels, most notably electricity, but also fuels like CNG, biodiesel, and propane. Last summer, I had the pleasure of interning with the New Jersey Clean Cities Coalition, a nonprofit dedicated to promoting the use of alternative fuels in the state's transportation sector. My primary project was a fleet evaluation, where I analyzed the economic, energy security, and environmental impacts of alternative

fuels on a gasoline and diesel work truck fleet. This involved research into fueling infrastructure, vehicle performance limitations, and costs and emissions modeling. Propane revealed itself to have attractive attributes that make it a compelling fuel for the future. In the following sections, I will evaluate the impacts of propane usage across several core competencies: financial viability (economics), environmental and energy security impacts, and performance viability. The first two sections concern the question: What benefits and drawbacks does propane use offer to individual fleets, the nation, and local/greater environmental health? The third section, on performance viability, concerns whether or not propane use is viable for a fleet, regardless of its potential benefits. After all, even if the numbers add up on paper, propane vehicles must be able to meet the sometimes intense demands of fleets, especially those performing emergency operations.

Economics of Propane Fleet Implementation

Propane often has a lower cost per gallon than gasoline at primary fueling stations (those dedicated to vehicle fueling). For instance, Alliance Autogas, a fleet conversion organization with a large propane fueling network, reported average propane prices for the week of September 1, 2023 between \$1.39 and \$1.71 per gallon, depending on the US region. During

the same week, gasoline prices in the United States averaged \$3.82 per gallon. Thus, per-gallon costs can be more than halved by propane conversion. It should be noted that propane has roughly 27% less energy per gallon than gasoline. However, the cost per gallon averaging less than half that of gasoline still makes it a more economical choice per unit of energy. Furthermore, propane is a higher octane fuel than gasoline, reducing maintenance needs and extending engine lifetime. Taken together, reduced fuel and maintenance costs can often result in a net payback for fleets that implement propane vehicles.

Infrastructure complexity and costs are also minimal with propane implementation. Traditionally, propane vehicle fueling stations simply consist of an above ground tank and dispensing equipment. Total infrastructure costs can be as low as \$65,000, and suppliers will often cover equipment costs in exchange for a fuel contract.

Environmental and Energy Security Impact of Propane Fleet Implementation

The emissions case for propane is favorable compared to its conventional counterparts. The Argonne National Lab GREET model estimates that conventional propane use reduces a vehicle's lifetime greenhouse gas emissions by nearly 13% compared to a gasoline counterpart. The use of

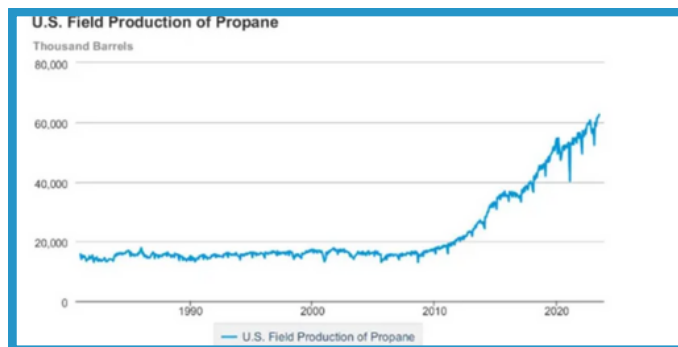
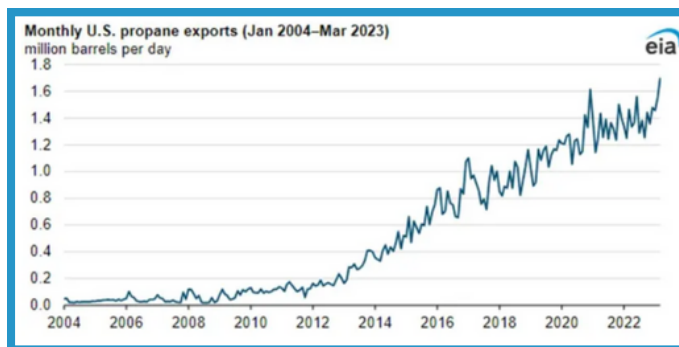
renewable propane, sourced from feedstocks like fat, vegetable oil, and waste grease, can significantly increase this reduction. According to the AFDC, the carbon intensity of renewable propane can be four times less than conventional propane. Thus, propane, especially when sourced renewably, can help fleets reduce their carbon footprint. Additionally, compared to diesel, propane use can cut nitrogen oxide emissions by roughly 95% in applications like school busing. This is important considering the harmful effects of local air pollutants like nitrogen oxides, especially around vulnerable populations like children.

Since 2000, US propane production has more than tripled, with recent production near 2.6 million barrels per day (mbpd). Exports make up over half of this, at 1.5 mbpd, while imports are only 80,000 bpd, meaning that the fuel is largely sourced domestically. It is thus an energy-secure fuel for use in the United States.

Furthermore, propane is sourced from crude oil refining and natural gas processing. When derived as a byproduct of natural gas production, according to the AFDC, it almost completely eliminates a fleet's lifetime petroleum consumption. While the US has recently become a net petroleum exporter, foreign imports still average over 8 million barrels per day, near 40% of consumption. Natural gas is domestically abundant, with imports less than 10% of domestic consumption and exports rapidly rising. Thus, by relying on a fuel that is not solely oil-based, like gasoline or diesel, fleets promote domestic energy security and reduce foreign oil reliance. Renewable propane, being sourced from domestic renewable feedstocks, has a similar energy security benefit.

Performance and Operational Viability of Propane Fleet Implementation

Propane Autogas already has a solid market size, being the third most common transportation fuel, behind



*Propane exports and production continue to increase in the U.S.
(Photo credit: FuelsFix)*

only gasoline and diesel. This is not surprising considering its performance characteristics. Propane vehicles can match or exceed the performance (power, acceleration) of conventional counterparts, even for heavy duty vehicles. For example, propane-fueled school buses provide a range up to 400 miles. Compare this to electric bus options which can get 75-210 miles on a single charge. Keep in mind that charging is a much more time consuming process than refueling with liquid propane. Additionally, the cost of a propane vehicle is roughly a third the price of an electric bus, allowing propane to replace conventional diesel fleets three times as fast as e-buses. Thus, even for heavy duty applications, propane is a functional choice for vehicle fleets.

Furthermore, propane's higher octane rating and lower contamination

characteristics can reduce engine wear and extend lifetime, making it an even more attractive option. New dedicated propane or bi-fuel (gasoline and propane) vehicles are widely available and can be purchased straight from manufacturers. Existing vehicles can be converted to run on propane as well.

To conclude, the transition of the transportation sector requires all options on the table to be considered. Propane, with its domestic abundance, operational viability, affordability, and relatively simple fueling infrastructure, makes quite the case for economic, energy security, and environmental gains. Although electric vehicles dominate the passenger vehicle industry, and will likely continue to, propane is worth exploring for decarbonization efforts in other sectors of transportation- like heavy duty trucking operations.

RESEARCHERS DEVELOP MICROMOBILITY GUIDANCE TOOL TO IMPROVE SAFETY OF SHARED E-SCOOTERS

Transportation Research Part A: Policy and Practice published the study, ["An E-Scooter Route Assignment Framework to Improve User Safety, Comfort, and Compliance with City Rules and Regulations."](#) The study develops a framework and micro mobility guidance tool to provide route and parking guidance for deckless

shared electric scooter users focused on safety, comfort, and regulatory compliance. The tool generates routes based upon infrastructure type and condition. Further research is suggested to examine the impact of pedestrian traffic volumes on e-scooter route choices.

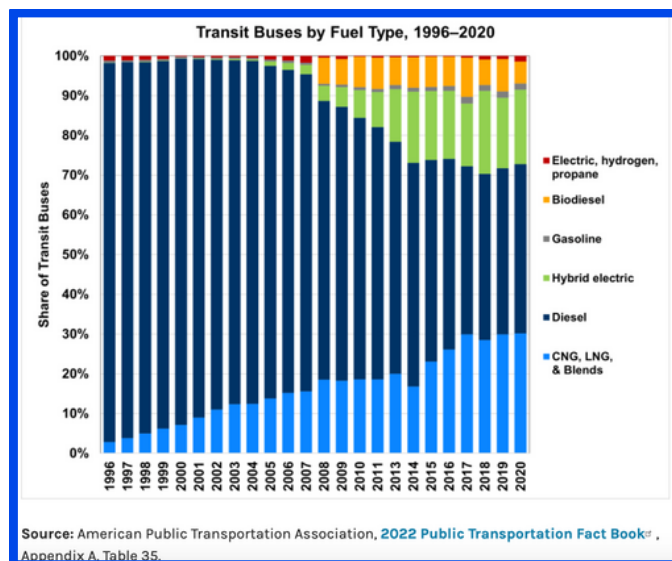
NEW PROGRAM OFFERS FREE TECHNICAL ASSISTANCE TO DEVELOP BUS FLEET ELECTRIFICATION PLANS:

The [National Renewable Energy Laboratory \(NREL\)](#) recently announced the [Clean Bus Planning Awards \(CBPA\) program](#), funded by the Joint Office of Energy and Transportation (Joint Office). Managed by NREL, the CBPA provides free technical assistance to create comprehensive and customized bus electrification plans for fleets across the United States.

"The CBPA program meets fleets wherever they are at in the planning process and helps make the overwhelming task of electrification feasible by providing plans that are tailored to the unique needs and requirements of each fleet," said NREL's Abby Brown, senior researcher and Joint Office technical assistance lead.

Applications for assistance are open on a rolling basis through September 30, 2024, giving fleets an opportunity to fully understand their needs before applying for support. This new program will reduce the burden of electrification by helping fleet managers create a step-by-step plan to transition their bus fleet. [Learn more about the program here.](#)

MORE THAN HALF OF ALL U.S. TRANSIT BUSES USED ALTERNATIVE FUELS IN 2020:



In 2020, more than half (56%) of all transit buses were either hybrid electric or powered by an alternative fuel such as natural gas, propane, hydrogen, biodiesel, or electricity. In 1996, the vast majority (95.4%) of transit buses were powered by conventional petroleum diesel. By 2020, conventional diesel transit buses represented only 42.7% of the total fleet. Natural gas, including compressed natural gas (CNG) and liquified natural gas (LNG), fueled 30.2% of transit buses in 2020 while 18.8% were hybrid electric, 5.6% ran on biodiesel, and 1/4% were powered by hydrogen.

BEEP FOR SUCCESS: VTO'S SUPERTRUCKS ARE HITTING THE ROAD:

The [U.S. National Blueprint for Transportation Decarbonization](#) highlighted that while medium- and heavy-duty trucks and buses compose only 5% of total vehicles on the road, they contribute 21% of current transportation emissions. VTO's SuperTruck program works with heavy vehicle manufacturers to pioneer medium- and heavy-duty truck and freight system concepts that achieve higher efficiency and zero emissions.

In December 2023, DOE's SuperTruck II program was successfully completed. Launched in 2016, it had a budget of \$160 million, equally shared by government and industry. Five teams, Cummins-Peterbilt, Daimler, Navistar, Paccar, and Volvo, participated in this program with the goal of doubling freight efficiency of 18-wheel tractor-trailer trucks compared to their 2010 baseline. SuperTruck II followed SuperTruck I, the first ever public-private partnership aimed at developing fuel-efficient technologies for long-haul trucks, and improving heavy-duty truck freight efficiency by 50%.

All SuperTruck II teams achieved or exceeded their freight efficiency tar-

gets. Some teams also demonstrated a 55% brake thermal efficiency goal, an engine efficiency breakthrough(link is external) in heavy-duty vehicles. All teams developed high efficiency engines, advanced aerodynamics, and lightweighting, as well as 48V mild-hybrid systems that facilitate a transition to electrification, improve fuel efficiency and reduce cold start NOx emissions. These technologies together have propelled heavy-duty fuel efficiency to a new height, demonstrating more than 16 miles per gallon(link is external) of diesel fuel. MotorWeek recently released (link is external)a video highlighting four of the SuperTrucks.

In 2023 the five SuperTruck 3 teams (Daimler, Ford, GM, Paccar, and Volvo) funded by VTO and the Hydrogen and Fuel Cell Technologies Office kicked off research and demonstration of battery electric and fuel-cell electric technologies that achieve even higher efficiency and zero emissions.



*The Volvo VNRe HD Electric Truck.
(Photo credit: TransEdge)*

SUSTAINING MEMBERS

PLATINUM LEVEL MEMBERS:



GOLD LEVEL MEMBERS:



ROLLINGER MOTORS



SILVER LEVEL MEMBERS:





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