NC STATE UNIVERSITY

SUSTAINABLE FLEET TECHNOLOGY CONFERENCE & EXPO 2023

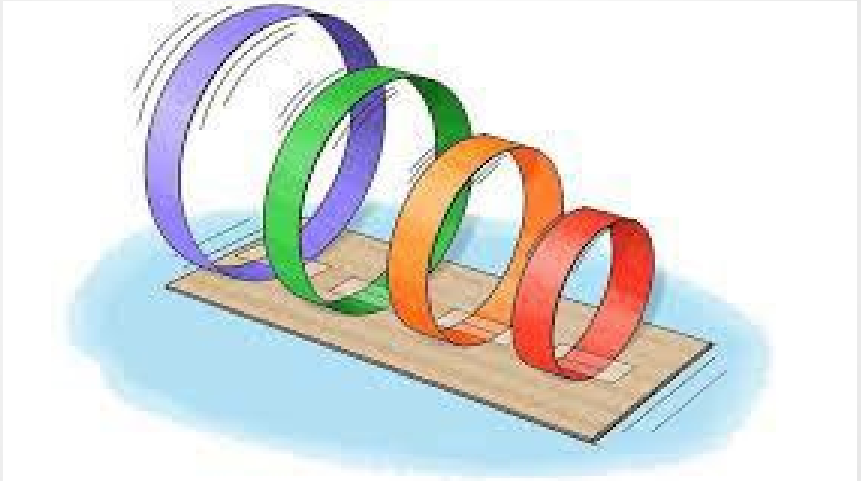
Track C Session 3: New Models for Fueling and Charging

August 16, 2023

NC CLEAN ENERGY TECHNOLOGY CENTER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Resonant Technology Capital, LLC



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Alternative Fleet Fueling Technology: Wireless Power Transmission

Mission

- **Resonant Technology Capital, LLC** invests in the emerging technology of in-motion wireless electric vehicle charging.

Wireless EV Charging

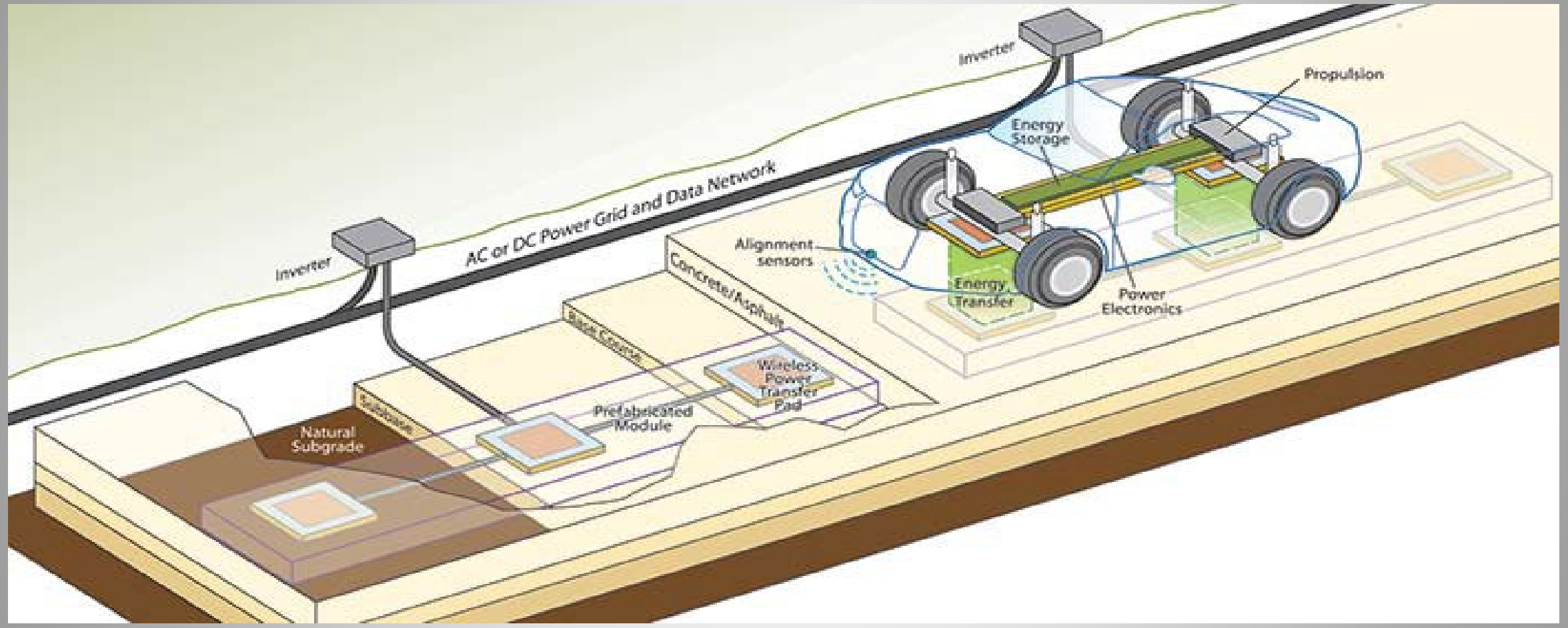
- Basic wireless charging is already available, although adoption is slow.
- A sending unit is installed where the vehicle is parked.
- A receiving unit is installed on the underside of the vehicle.

Wireless power transmission (WPT) is referred to as induction. Resonant induction permits the sending and receiving nodes to be distant by matching frequencies.

In-motion EV Charging

- In-motion wireless EV charging is in the pilot stage. Researchers in the USA, the UK, Germany, France, Israel and Japan are advancing the technology now.
- Those researchers include large corporations and small startups, universities such as M.I.T., and government agencies such as Oak Ridge National Laboratory.

In-motion EV Charging



This system for in-motion EV charging was developed at Utah State University

Smart Powered Roadway

This ¼ mile electrified track in Logan, Utah is a testing ground for in-motion EV charging develop-ment.

Photo: Sydney Dahle

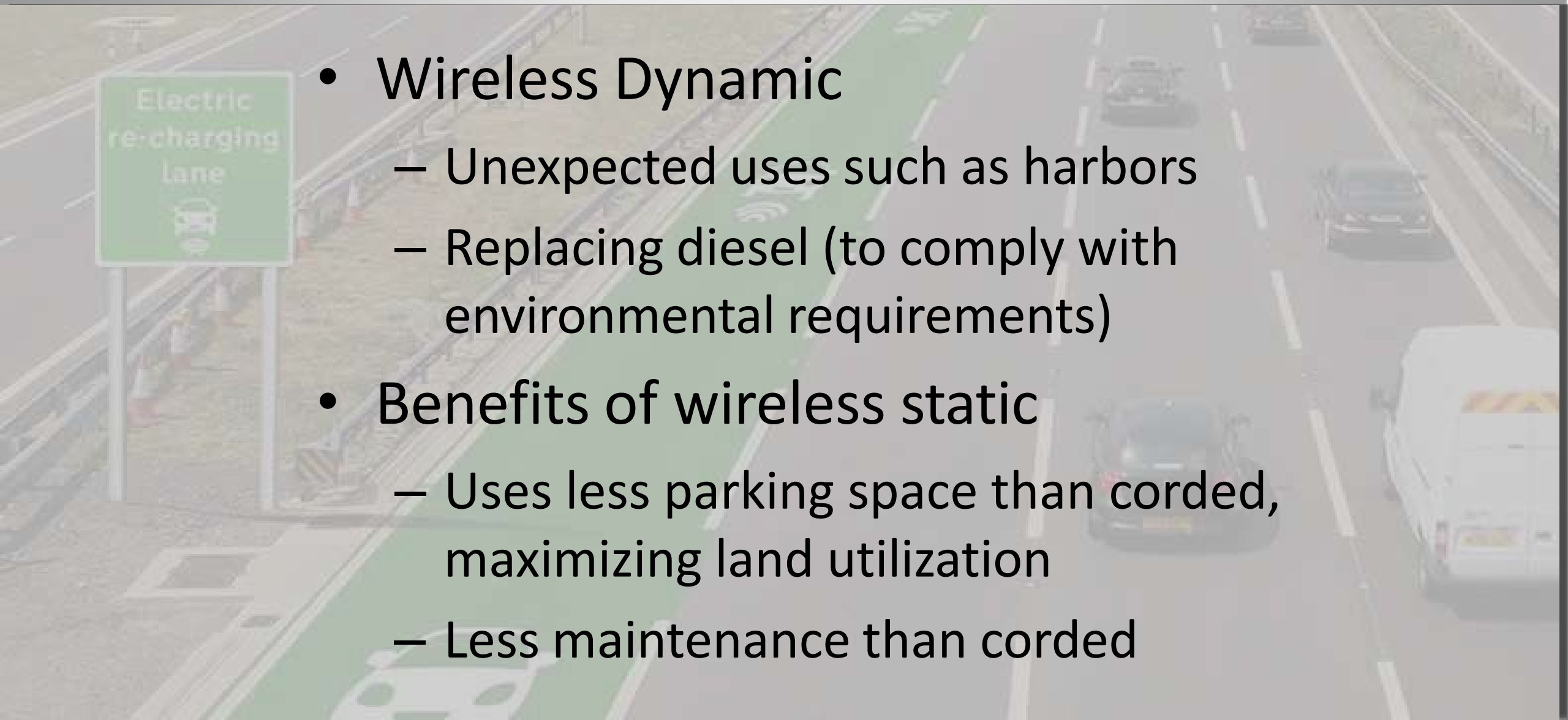
In-motion EV Charging

- This technology has the potential to transform the automotive industry. The commercial potential is estimated to be >$136B annually.
- Tesla, Volvo and others are developing electric long-haul trucks, which would be especially suitable for in-motion charging installed in a lane of Interstate highways.
- China already has over 500,000 electric buses in service

In-motion EV Charging

- Two systems are proposed for in-motion wireless charging; they are not mutually exclusive:
  - Dynamic EV Charging (DEVC): charging transfer element installed in (or on) the roadway. Permits high charging volume; installation would be expensive. Suitable for busy highways.
  - Fixed automatic single location (Static): Very suitable for high-density urban intersections. Lower cost, but possibly less total charging per vehicle. Could use existing technology. A Japanese study shows urban drivers spend as much as 40% of their time at stop lights.

Fleet Installations



- Wireless Dynamic
  - Unexpected uses such as harbors
  - Replacing diesel (to comply with environmental requirements)
- Benefits of wireless static
  - Uses less parking space than corded, maximizing land utilization
  - Less maintenance than corded

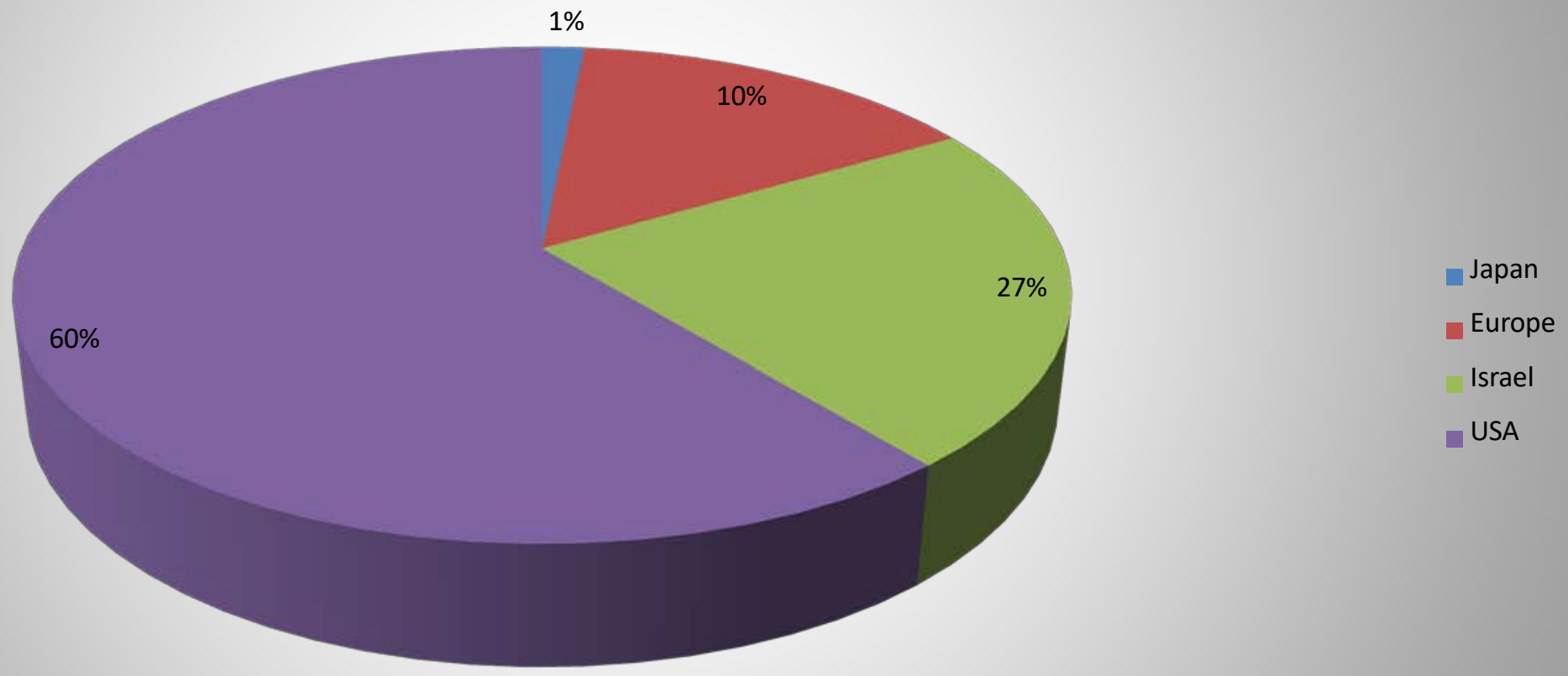
Antelope Valley (CA) Transit Authority

- The first all-electric transit agency in North America.

  AVTA's 100% electric zero-emission transit fleet consists of:
- 62 BYD zero-emission buses
- 8 battery electric support vehicles
- 24 MCI battery-electric commuter coaches
- January 2022, Antelope Valley Transit Authority celebrated seven million miles driven by its all-electric zero emission fleet. Those seven million electric miles represent:
  - 1,750,000 gallons of diesel fuel avoided
  - $2,362,500 Net Savings
  - 41.58 million pounds of CO2 reduced

- https://www.avta.com/avta-039-s-journey-to-electrification---video

Geographic Diversification



As of July 2023

Thank you for your interest

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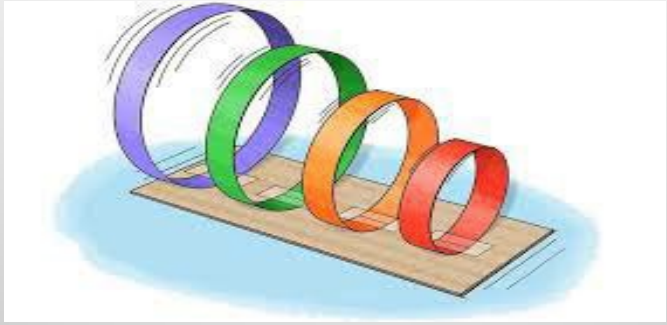


Sustainable Fleet Technology Conference

New Models for Fueling Fleet Vehicles

John Plant
Chevron Renewable Energy Group
Senior Manager Strategic Initiatives

Cautionary statement

This presentation contains forward-looking statements relating to Chevron's operations and energy transition plans that are based on management's current expectations, estimates and projections about the petroleum, chemicals and other energy-related industries. Words or phrases such as "anticipates," "expects," "intends," "plans," "targets," "advances," "commits," "drives," "aims," "forecasts," "projects," "believes," "approaches," "seeks," "schedules," "estimates," "positions," "pursues," "may," "can," "could," "should," "will," "budgets," "outlook," "trends," "guidance," "focus," "on track," "goals," "objectives," "strategies," "opportunities," "poised," "potential," "ambitions," "aspires" and similar expressions are intended to identify such forward-looking statements. These statements are not guarantees of future performance and are subject to certain risks, uncertainties and other factors, many of which are beyond the company's control and are difficult to predict. Therefore, actual outcomes and results may differ materially from what is expressed or forecasted in such forward-looking statements. The reader should not place undue reliance on these forward-looking statements, which speak only as of the date of this presentation. Unless legally required, Chevron undertakes no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.

Among the important factors that could cause actual results to differ materially from those in the forward-looking statements are: changing crude oil and natural gas prices and demand for the company's products, and production curtailments due to market conditions; crude oil production quotas or other actions that might be imposed by the Organization of Petroleum Exporting Countries and other producing countries; technological advancements; changes to government policies in the countries in which the company operates; public health crises, such as pandemics (including coronavirus (COVID-19)) and epidemics, and any related government policies and actions; disruptions in the company's global supply chain, including supply chain constraints and escalation of the cost of goods and services; changing economic, regulatory and political environments in the various countries in which the company operates; general domestic and international economic and political conditions, including the military conflict between Russia and Ukraine and the global response to such conflict; changing refining, marketing and chemicals margins; actions of competitors or regulators; timing of exploration expenses; timing of crude oil liftings; the competitiveness of alternate-energy sources or product substitutes; development of large carbon capture and offset markets; the results of operations and financial condition of the company's suppliers, vendors, partners and equity affiliates, particularly during the COVID-19 pandemic; the inability or failure of the company's joint-venture partners to fund their share of operations and development activities; the potential failure to achieve expected net production from existing and future crude oil and natural gas development projects; potential delays in the development, construction or start-up of planned projects; the potential disruption or interruption of the company's operations due to war, accidents, political events, civil unrest, severe weather, cyber threats, terrorist acts, or other natural or human causes beyond the company's control; the potential liability for remedial actions or assessments under existing or future environmental regulations and litigation; significant operational, investment or product changes undertaken or required by existing or future environmental statutes and regulations, including international agreements and national or regional legislation and regulatory measures to limit or reduce greenhouse gas emissions; the potential liability resulting from pending or future litigation; the company's future acquisitions or dispositions of assets or shares or the delay or failure of such transactions to close based on required closing conditions; the potential for gains and losses from asset dispositions or impairments; government mandated sales, divestitures, recapitalizations, taxes and tax audits, tariffs, sanctions, changes in fiscal terms or restrictions on scope of company operations; foreign currency movements compared with the U.S. dollar; material reductions in corporate liquidity and access to debt markets; the receipt of required Board authorizations to implement capital allocation strategies, including future stock repurchase programs and dividend payments; the effects of changed accounting rules under generally accepted accounting principles promulgated by rule-setting bodies; the company's ability to identify and mitigate the risks and hazards inherent in operating in the global energy industry; and the factors set forth under the heading "Risk Factors" on pages 20 through 25 of the company's 2021 Annual Report on Form 10-K and in subsequent filings with the U.S. Securities and Exchange Commission. Other unpredictable or unknown factors not discussed in this presentation could also have material adverse effects on forward-looking statements.

As used in this presentation, the term "Chevron" and such terms as "the company," "the corporation," "our," "we," "us" and "its" may refer to Chevron Corporation, one or more of its consolidated subsidiaries, or to all of them taken as a whole. All of these terms are used for convenience only and are not intended as a precise description of any of the separate companies, each of which manages its own affairs.

Terms such as "resources" may be used in this presentation to describe certain aspects of Chevron's portfolio and oil and gas properties beyond the proved reserves. For definitions of, and further information regarding, this and other terms, see the "Glossary of Energy and Financial Terms" on pages 24 through 25 of Chevron's 2021 Supplement to the Annual Report available at chevron.com.

Production And Distribution

45+ TERMINALS

11 BIOREFINERIES

DELIVERED PRODUCT TO:

44 STATES

6 CANADIAN PROVINCES

19 COUNTRIES

REG is Reducing Carbon at Scale

4.1 MILLION METRIC TONS

OF CARBON REDUCTION[1]

FROM AN ESTIMATED 480 MILLION GALLONS OF BIO-BASED DIESELPRODUCED IN 2021

EQUIVALENT TO

GHG EMISSIONS FROM
10.2 BILLION MILES
DRIVEN BY AN AVERAGE PASSENGER VEHICLE[2]

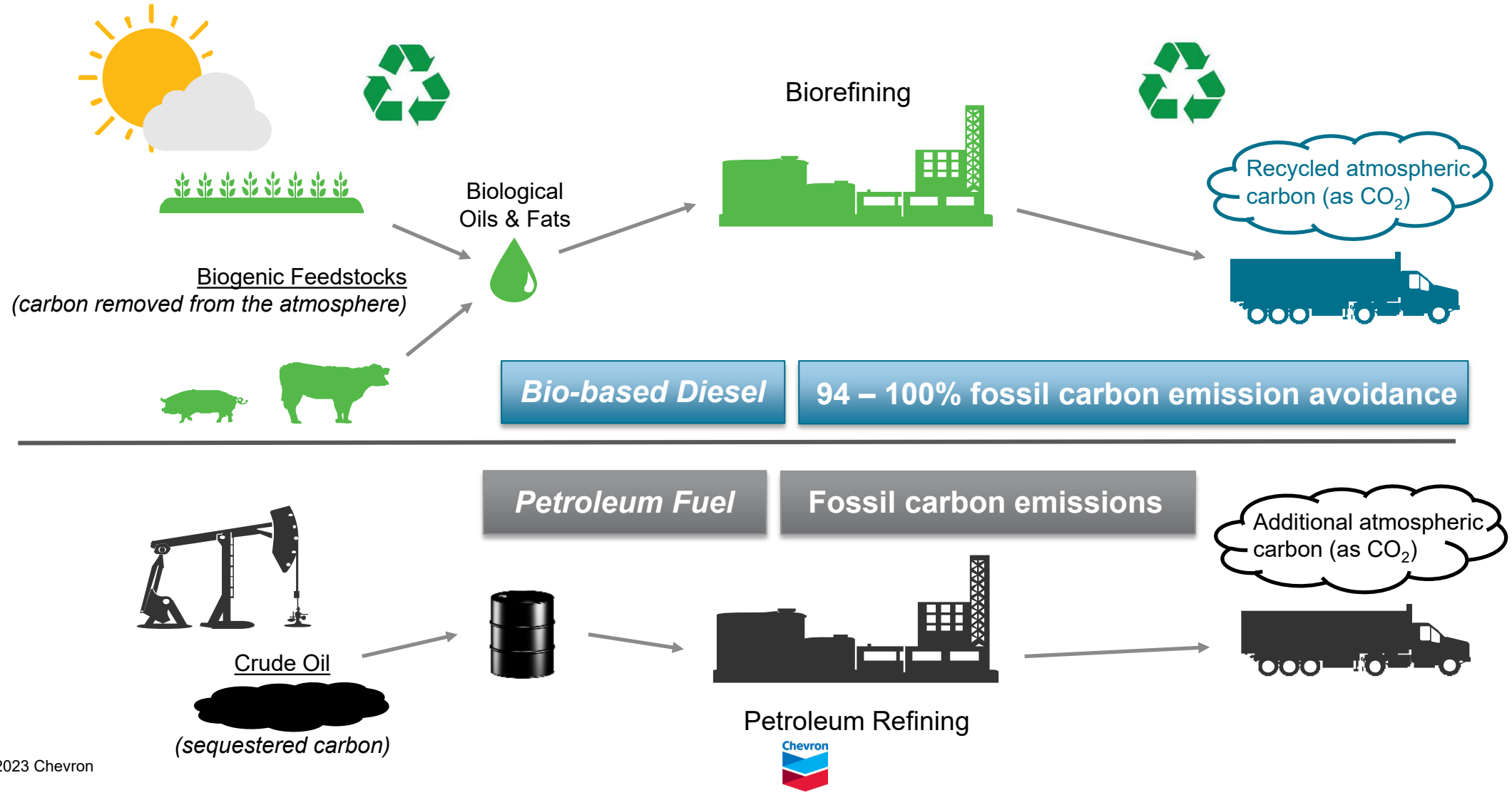
CO_2 EMISSIONS FROM
4.5 BILLION POUNDS
OF COAL BURNED[2]

CO_2 SEQUESTERED BY
5.0 MILLION ACRES
OF U.S. FORESTS IN ONE YEAR[2]

CO_2 EMISSION REDUCTION FROM
1.2 MILLION
PASSENGER ELECTRIC VEHICLES ON THE ROAD IN ONE YEAR[3]

(1) Carbon reduction based on life cycle analysis of REG-produced fuels versus petroleum diesel.
(2) EPA.gov/energy/greenhouse-gas-equivalencies-calculator
(3) Assumes annual travel of 11,484 miles/year and national grid average electricity versus gasoline using CA-GREET

Biogenic Carbon vs. Fossil Carbon



B100 with Optimus Technology

Chevron REG and Optimus have a strategic marketing agreement to jointly develop and implement technology with fleets in public and private sectors.

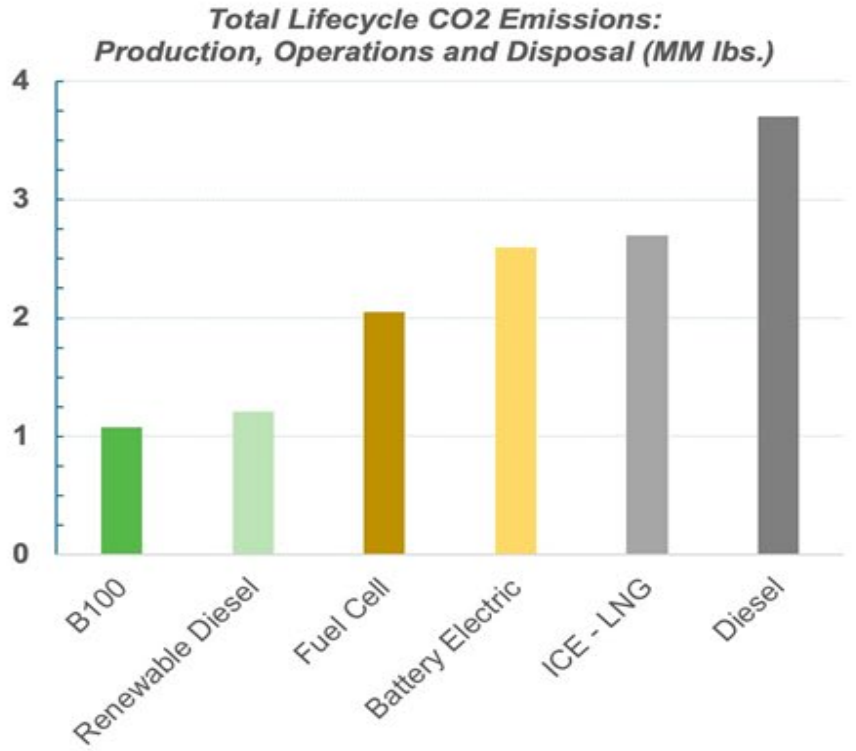
Optimus enables use of B100 providing 100% Scope 1 and Scope 2 greenhouse gas emission reduction compared to baseline of diesel fuel.

Who Is Utilizing B100 Technology?

- Archer Daniels Midland
- Renewable Energy Group
- Pepsico/Frito Lay
- Washington DC Public Works
- Washington DC Water
- Iowa DOT
- City of Ames
- City of Des Moines
- City of Madison
- Chicago Parks District
- Cook-Illinois Bus Company
- Refuse trucks
- Jobber delivery trucks
- Snowplows
- Dump and service trucks
- Class 8 Tractors
- Combination trucks: jobber with tankers
- School Buses

B100 – The Lowest CO_2 Option

*If a class 8 truck powered by 100% biodiesel is replaced with a BEV, the net carbon emissions output as a result would be increased by **2.5x.***



Class 8 internal combustion engine trucks utilizing B100 rank as the lowest total lifecycle CO_2 emissions (including truck production, operations, and disposal).

Source: American Transportation Research Institute (ATRI), May 2022 - *Understanding the CO_2 Impacts of Zero-Emission Trucks: A Comparative Life-Cycle Analysis of Battery Electric, Hydrogen Fuel Cell and Traditional Diesel Trucks*

An inexpensive way to lower carbon today— REG biomass-based diesel

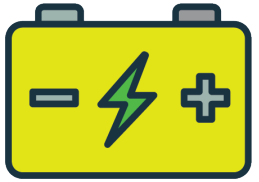
REG Bio-Based Diesel Can Reduce Carbon Emissions More than CNG-Fueled or Electric Vehicles

88%

v. Diesel(1)

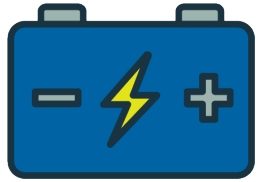
85%

v. CNG(1)



65%

v. EV and US grid average electricity(1)



42%

v. EV and CA grid average electricity(1)

Source: Company.

(1) Carbon reduction compared to REG's best-in-class biodiesel plant Albert Lea using UCO with life cycle analysis based on CA-GREET 3.0; utilized EV EER of 5.0 for heavy duty vehicles.

Biodiesel

InfiniD™ is a high-quality biofuel for use in virtually all conventional diesel applications

Enables reduced carbon today with much lower Carbon Intensity (CI)

Lower carbon, oxygenated fuel option that can improve combustion quality and lubricity when blended

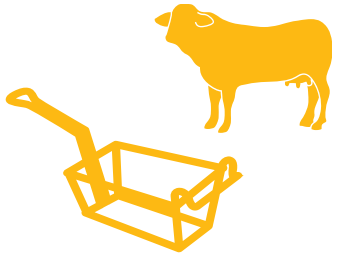
Lower carbon engine emissions: decreases harmful pollutants in tailpipe emissions from legacy engines and reduces the burden on New Technology Diesel Engines (NTDE) emissions control systems (fewer DPF regenerations, for example)

Compared to petroleum diesel, can help reduce engine emissions by:
+ Up to 100% for fossil carbon[1]
+ Up to 70% for total hydrocarbon[2, 3]
+ Up to 70% for particulate matter[3]

1 Product is produced utilizing 100% renewable oils and fats. Methanol used to make biodiesel and hydrogen used to make renewable diesel and SAF are typically made from conventional natural gas.
2 https://afdc.energy.gov/vehicles/diesels_emissions.html
3 Reductions based on emissions data from California Air Resources Board and compared to U.S. federal ULSD, (Durbin, et al., 2011)

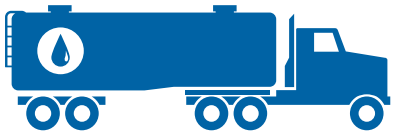
Lower Carbon Solution Available at Scale Now

Providing Lower Carbon Fuel Solutions for Over Two Decades



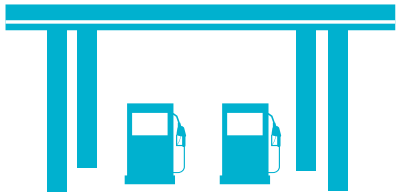
Waste & Byproduct Fats & Oils

Renewable Lower Carbon Feedstock



95-100% Scope 1 + 2 GHG Emissions*

Biodiesel (BD)
Renewable Diesel (RD)



Downstream Distribution

Growing Distribution Network

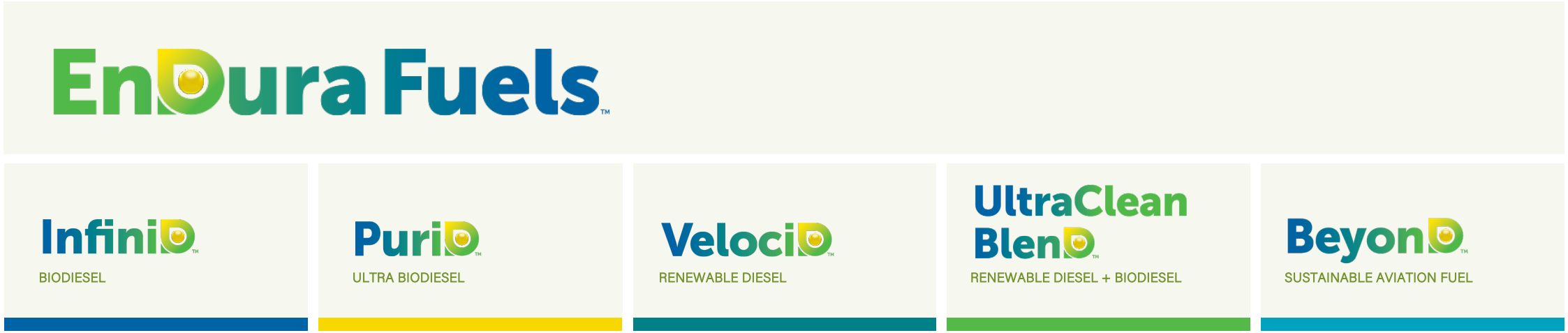
Source:
*. EPA Lifecycle Greenhouse Gas Emissions for Select Pathways

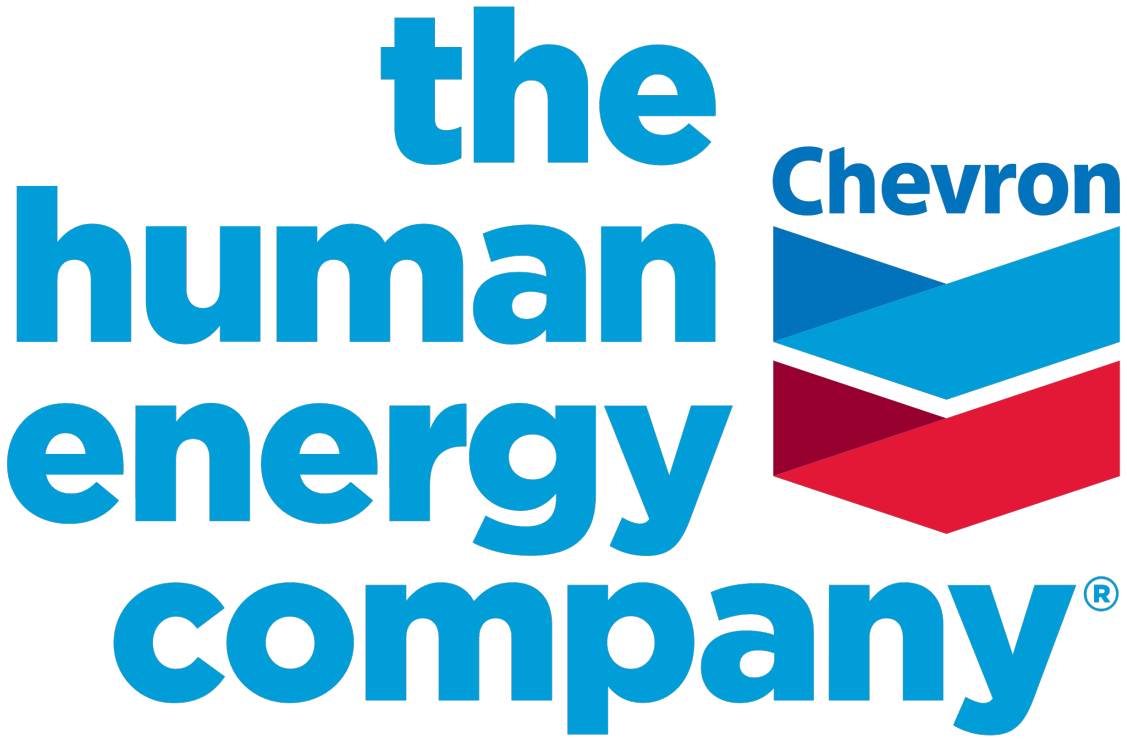
Our Products

EnDura Fuels™ is a complete line of lower carbon fuel solutions to help your company work toward reduced carbon intensity and operational targets.

Reduces carbon emissions

Available today





Alliance AutoGas
POWERED BY PROPANE
Proven to Perform

New Models for Fueling and Charging

Wednesday, August 16th

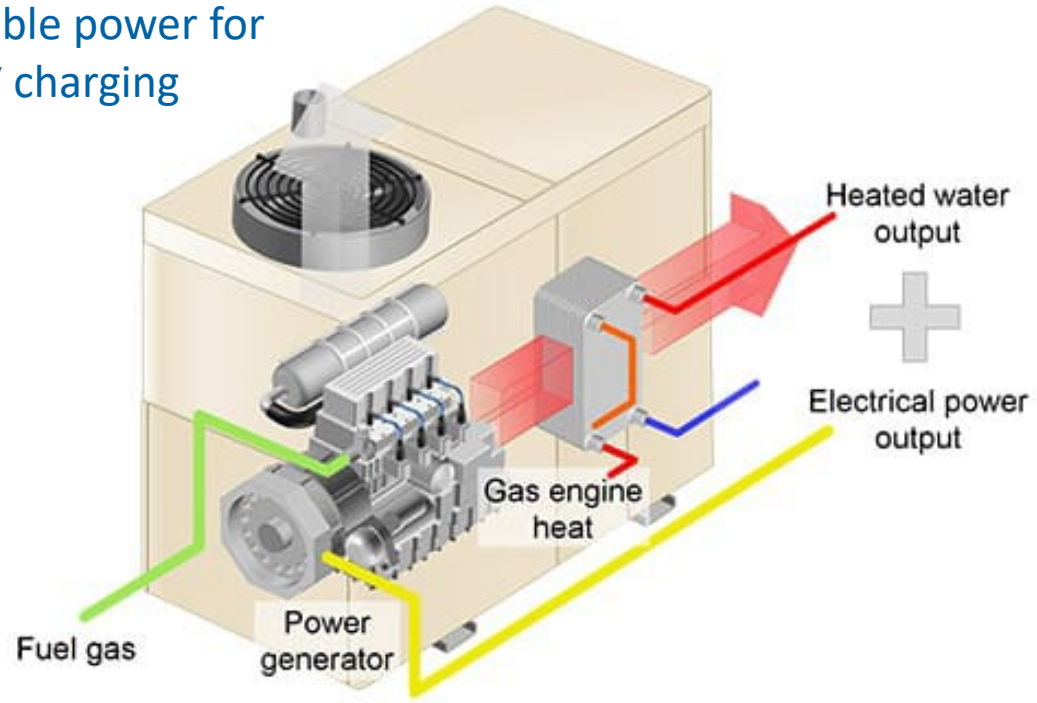
Stuart Weidie
Alliance AutoGas

EV Power Pods – Mobile Charging

EV Power Pods

Personal Power Plants

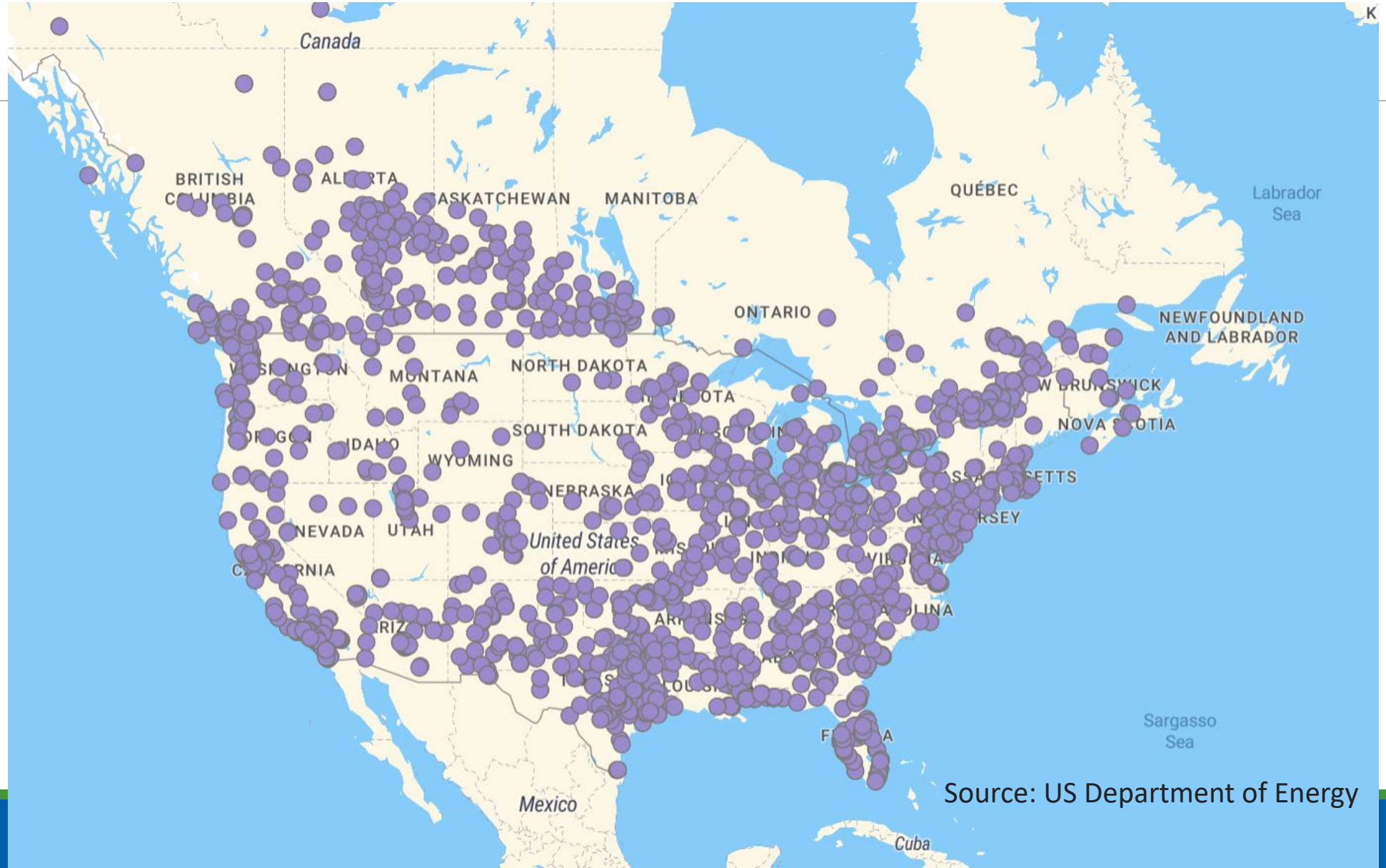
mCHP – Reliable power for home EV charging



Case Study

City of Knoxville

Nationwide Autogas Refueling



Source: US Department of Energy

Renewable Propane

RENEWABLE PROPANE (rP)

50/50 blend of propane and renewable propane (rp)

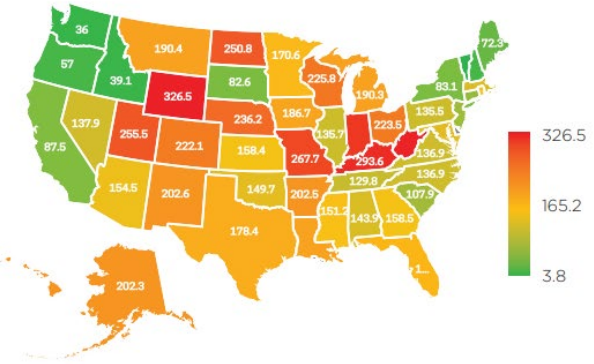
Currently, renewable propane provides a lower carbon footprint solution in all 50 U.S. states except Vermont when compared to EVs that are charged using the electrical grid. The entire U.S. propane industry is targeting at least a 50 percent replacement of conventional propane with renewable propane by 2050.

52 gCO2eq/MJ
AVERAGE FOOTPRINT

CONVENTIONAL PROPANE

Because of propane's low-carbon, high-energy output, it's a perfect fuel for residential and commercial applications such as vehicle fleets, agriculture and industrial work, and landscape management, just to name a few.

79.8 gCO2eq/MJ
AVERAGE FOOTPRINT



ELECTRICAL GRID

Along with emissions, the U.S. electrical grid can also lead to higher NOx and particulate matter emissions than the regulated internal combustion engine vehicles tail-pipe productive. Hence, full electrification is not correlative to decarbonization.

165 gCO2eq/MJ
AVERAGE GRID ELECTRICITY

Alliance AutoGas
POWERED BY PROPANE

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