

Electricity as Vehicle Fuel Working Group

Energy use for vocational and off-road applications



TRANE
TECHNOLOGIES



**We believe visionary leadership
empowers positive change**

Trane Technologies (NYSE:TT) is a global climate innovator. Through our strategic brands Trane and **Thermo King**, and our portfolio of environmental products and services, we bring sustainable, efficient climate solutions to buildings, homes, and refrigerated transport.



34
Manufacturing
Locations Worldwide



~37,000
Employees



Our Purpose
Boldly challenge
what's possible for a
sustainable world

Thermo King: Minnesota origins, Investing in Sustainability



Founding story.



Growth story.



Today's story.

1938

Fred Jones invents the Model A, the first mobile refrigeration unit using active refrigeration

1950s

Invention of Bus AC & Marine Refrigeration, expands company beyond truck refrigeration.

1960s

Introduction of diesel engine technology, single unit nose-mount systems, and dual compartment, multi-temp trailers

1970s

Rapid Expansion into Global Markets and Manufacturing Capabilities

1990s

Investment in Telematics & Digital Technology

2000s

Technology Advancements to Improve Fuel Efficiency & Reduce Carbon Emissions

Leading the Industry in the Electrification Journey



Portfolio of electric transport & refrigeration solutions for truck, trailer, bus, rail and marine applications.

TriPac Envidia® APU

An all-electric auxiliary power unit.



e200

A fully electric TRU for Class 1-4 trucks and vans.



e300

A fully electric TRU for Class 2-4 trucks.



e1000

A fully electric engineless TRU for Class 5-7 trucks.



Precedent S-750i

A diesel-electric unit for long-haul trailers. Grid-Powered for emissions-free stationary operation



evolve™ Electric Trailer

Battery-electric demonstration trailers.



Next Generation TE-Series

An all-electric HVAC system for buses.



Brief Background: Motor Fuel Excise Tax

- Since the 1970s, Minnesota has allowed refunds for 'off-highway business use' applications of the tax used to fund highway construction and maintenance
- 'Off-highway business use' refunds were not included in MN Statute "296A.075 ELECTRICITY AS VEHICLE FUEL TAX", potentially creating additional costs for Farmers and Grocers (Cold Chain), and the Aviation, Construction, and Medicine sectors

1919

First states enact Motor Fuel Taxes to finance infrastructure. MN enacted 1925.

1956

Federal-Aid Highway Act of 1956 establishes the Highway Trust Fund

1990s

Energy Policy Act **1992**: Electricity deemed Alternative Fuel Source
1994: IRS mandates off-road fuel to be dyed red



1932

Federal Motor Fuel Excise Tax Enacted

1970s

Minnesota introduces tax credits and rebates for off-road use of taxed fuel*

2000s - Now

Current Form PDR-1 for Off-Road refund; Electricity as Vehicle Fuel Tax enacted for July 2027



[*792892.pdf](#)

Red Diesel Enables Enforcement; You Can't Dye Electricity Red



- Allows for blitz inspections by authorities
- Imposes penalties for tax fraud if found mis-used
- Red Diesel is tax exempt upfront to customers

Possible Impact to Cold Chain Fleets (e.g. Farmers, Grocers)

ANALYZING THE IMPACT OF THE PROPOSED TAX RATE FOR AN OFF-ROAD APPLICATION EXAMPLE: TRU VS eTRU

- There is possibility for a significant tax impact that stands to be refunded under the 'off-highway business use' exemption definition
- Possibility of up to \$1000 per unit per year*



Minnesota Averages from December 2025

Product	Consumption per hour	Tax rate	Tax Cost per Hour (Calculated)	Yearly Hours of Operation	Total Tax Impact
TRU	.7 gal/hr	\$.318	\$.226*	2500*	\$565*
eTRU	8 kw/hr	\$.05	\$.40*	2500	\$1000*

- Without the rebate, qualified end users (e.g. farmers, grocers) pay more

Minnesota Enables Off-Highway Refunds for Alternative Fuels: Motor Fuel Tax Claim for Refund (PDR-1)

- Red-Diesel is not available everywhere; therefore, qualified parties can file a claim for a refund
- Minnesota Statute exempts Off-Highway Business Use* including:
 - Off-Road (including construction and agriculture),
 - Power Take Off (PTO)
 - Both manually logged and digitally recorded PTO use can be submitted
 - Biodiesel Blends,
 - Transit and Ambulance,
 - Aviation
 - Transport Refrigeration Units*

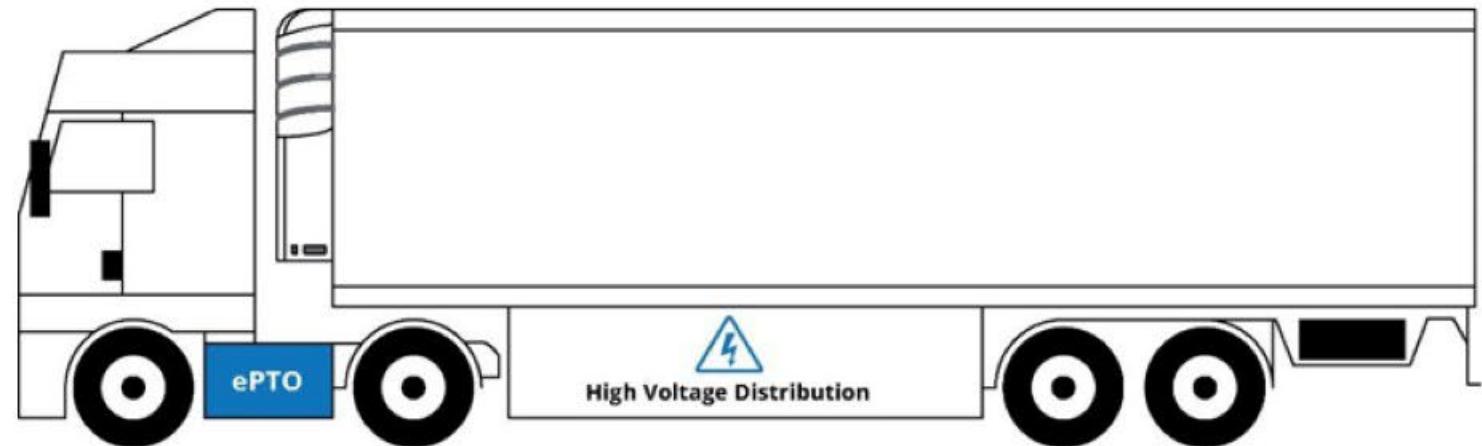
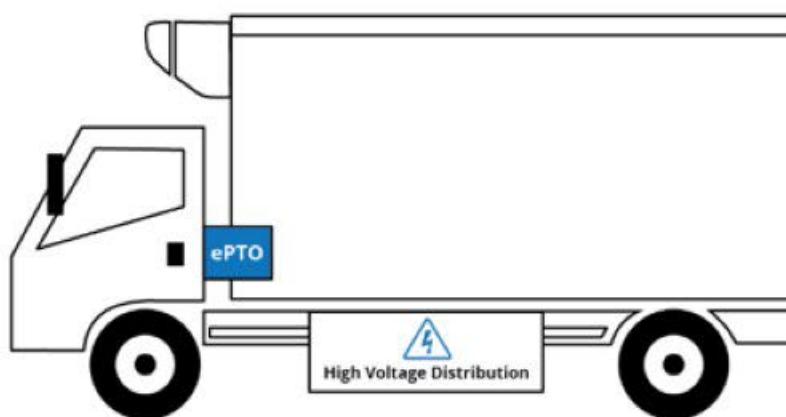


* Sec. 296A.16 MN Statutes Subd. 2. and Subd. 4.

** Sec. 296A.075 MN Statutes Subd. 2.

Electric Power Take-Off (ePTO)

- *Industry Application*: Fleets operating battery electric vehicles will benefit from shared use of the vehicle energy storage for on-board accessory equipment and off-board power export.
- The ePTO approach offers a single charging connection and an efficient energy management solution.
- Body, trailer or off-board power equipment powered as an accessory from the vehicle **DC Battery**
- The ePTO connection can be active while driving, stationary, during off-duty overnight driver rest periods and during any vehicle charging session.



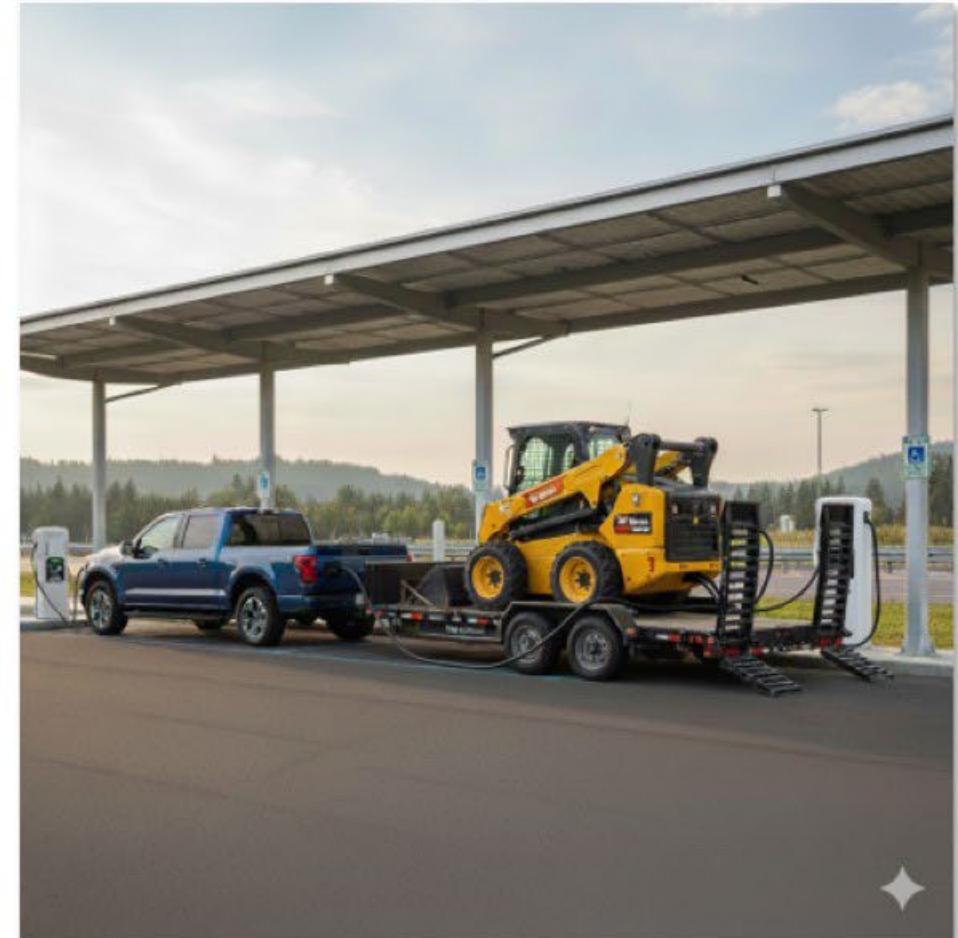
Example: Mixed Use with Public Charging, Vehicle to Load (V2L)

SCENARIO:

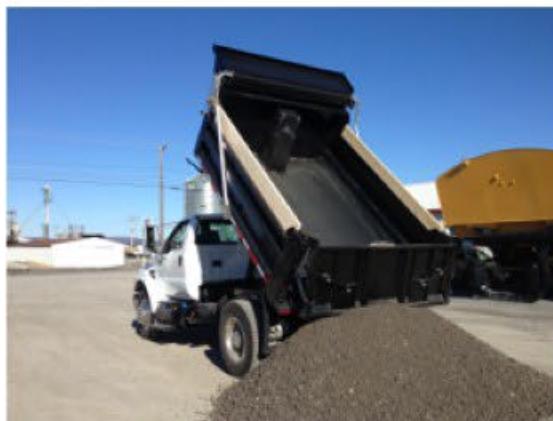
- Contractor driving electric pickup truck, carrying electric loader for business use
- Stops to charge pickup truck and loader from public charging

OPTIONS:

- Truck can fast-charge at public station during lunch breaks and transfer power to the construction equipment upon return to the job site (V2L)
- If these were diesel vehicles, the contractor could apply for fuel tax rebate on diesel used in the loader or access exempt red diesel fueling
- Contractor can supply red diesel to the loader from an extra fuel tank located on the pickup truck



Vocational Examples: PTO



Vocational Examples: Construction, Agriculture, Service and Off-Road



Minnesota Could Pursue Tax Parity for Alternative Fuel for Off-Highway Business Use Applications

Solving the “red electricity” challenge, consider:

- ePTO
- Mixed Use at Public Charging Stations

Questions to think about:

- Could unique identifiers (e.g. barcode) on either the vehicle/equipment or Charging stations be used to differentiate tax exempt equipment at the charging station?
- Could form PDR-1 be modified to allow vehicle owners simply request a refund as they do today?



* [Sec. 296A.16 MN Statutes](#) Subd. 2. and Subd. 4.

** [Sec. 296A.075 MN Statutes](#) Subd. 2.

Thank you!