



# Electric Transport Refrigeration Units

## Financial and Environmental Savings for Your Business

### Overview

Transport refrigeration units (TRUs) are mobile refrigeration systems that supply precise temperature control for perishable goods during transport and storage. These systems have traditionally been powered by a diesel internal combustion engine (ICE), but many industries are now making the switch to hybrid diesel/electric transport refrigeration units (eTRUs), which use electricity to power the unit while not in motion. Powering the compressor with electricity offers environmental benefits, increased efficiency and lower maintenance requirements.

eTRUs are gaining momentum, particularly as interest in online shopping for and delivery of refrigerated goods grows. The technology is being deployed in both long- and short-haul applications and can be used in the same industries served by conventional TRUs:

- Food manufacturing and distribution
- Pharmaceutical and cosmetics manufacturing and distribution
- Plant, flower and animal transport
- Delicate furniture or equipment transport

## Business Solutions from Your Electric Cooperative

As a local electric cooperative, we are here to support your business as you decide to make the switch to electric mobile refrigeration. We can help you with an initial assessment, including cost and environmental savings, as well as provide vendor recommendations and ensure all infrastructure needs are met. The sections below provide operational and financial information about eTRUs to help get you started.

### Benefits



**Emissions:** Operating on electricity means no local, on-site emissions when parked and plugged in for hours or days, providing cleaner and healthier air for the surrounding environment. Many businesses underestimate time spent idling and its environmental and financial impacts.



**Ongoing Savings:** Electric motors and electric/diesel hybrid equipment require less maintenance than diesel engines. In addition, electricity prices are cheaper and more stable than diesel fuel. Therefore, eTRUs cost less to run and maintain.



**Quiet Operation:** When connected to the grid, eTRUs are significantly quieter than their ICE counterparts thanks to their electric motors and components. This benefit can be especially valuable if operating overnight near residential areas.

### Barriers









**Upfront Cost:** eTRUs tend to cost more upfront than diesel-powered models, but lower operating costs can help make up the difference.



**Infrastructure Needs:** Electric infrastructure must be developed at idling locations as well as other non-transit locations, like truck stops, warehouses, intermodal stations or ports, and points of sale. Electric cooperatives and other utility providers are building this infrastructure to support industries' transition to eTRUs.

# Cost Comparison

	eTRU	TRU
 Additional Upfront Cost for eTRU	\$4,200	\$0
 Electrical Infrastructure Cost	\$7,200	\$0
 Annual Fueling Cost	\$1,280	\$4,131
 Annual Maintenance Cost	\$634	\$752
 Total Annual Operating Cost	\$3,543	\$4,883
 Total Cost of Ownership (NPV)	\$23,634	\$30,422



*This table is an example only. For actual projects, official equipment quotes from relevant vendors must be obtained to determine project payback. Manufacturer warranties may impact annual maintenance costs and should be considered. Assumptions: Long-haul eTRU (greater than 25-HP motor) with rear outlet; one pedestal-style outdoor outlet installed at facility per eTRU; 7-year life; 2,000 hours of idling per year; electricity cost = 8¢/kWh; diesel cost = \$2.43/gallon. Per EIA Annual Energy Outlook 2020 the escalation rate is 2% for electricity, and 3% for propane. An escalation rate of 3% was used for equipment and maintenance costs. The pedestal-style outdoor outlet will have a longer life than the eTRU and will likely not need to be replaced when the eTRU is replaced. Additionally, if the facility does not operate with all trucks idling on-site simultaneously, fewer outlets can be purchased.*

## Additional Information

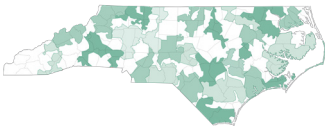
eTRUs come in two common configurations, both with plug-in capability: hybrid-electric and electric standby. Hybrid-electric versions pair an integral diesel ICE with an electric generator. This engine-generator set powers the refrigeration compressor. Electric standby versions employ a diesel ICE and a distinct electric motor.



As with traditional TRUs, eTRUs support use cases including:

- Temperature or humidity control during precooling, loading, unloading, staging and long-term storage of goods
- Refrigerated trucking and cold storage
- Moving and transporting goods




## Contact Us

For more information, please contact your local electric cooperative. Visit [ncelectriccooperatives.com/our-members](http://ncelectriccooperatives.com/our-members) to find contact information for your co-op. Ask for your co-op’s key accounts representative.



**Connect with NCEC:**  
 Contact your Key Accounts Rep  
 [www.ncelectriccooperatives.com](http://www.ncelectriccooperatives.com)



**Connect with Advanced Energy:**  
 (919) 857-9000  
 [moreinfo@advancedenergy.org](mailto:moreinfo@advancedenergy.org)  
 [www.advancedenergy.org](http://www.advancedenergy.org)