



eTRU: What You Need to Know

Transport Refrigeration Units, commonly referred to as TRUs, are refrigeration systems that are typically powered by internal combustion engines. The “e” in eTRU stands for Electric. In an eTRU, the refrigeration system’s compressor is driven by an electric motor all or at least part of the time. TRUs control the environment of temperature-sensitive products that are transported in refrigerated trucks, trailers, railcars, and shipping containers. TRUs are used to transport and store many products such as food, pharmaceuticals, plants, medicines, and chemicals.

Some companies use TRUs for extended cold storage. Distribution centers and grocery stores may run out of cold storage space in their buildings and then opt to store overflow goods in TRU-equipped trucks and trailers outside their buildings. Distribution centers, truck stops, and other cold storage facilities also attract large volumes of TRUs that contribute to higher localized health risks.

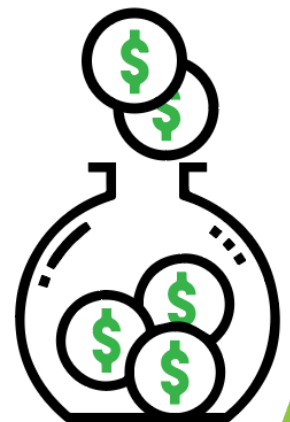
New regulations are developing concepts to reduce emissions from facilities with TRU activity by transitioning to zero-emission operation where practical. This is where eTRU comes in! eTRUs are the answer to the inadequacies of today’s traditional diesel-powered reefer units (TRUs). eTRU technology provides safe, utility shore power to electric or hybrid Transport Refrigeration Units eliminating emissions while loading/unloading or idle. Connecting TRU’s to shore power eliminates the need to run onboard diesel generators/engines to keep the cargo within the optimal temperature range.

Cost Savings

The cost of electricity in the United States is less expensive than diesel fuel and much more predictable. Utilizing a savings calculator like the one here <https://eslpwr.com/calculator/>, can help determine how much you could save in fuel consumption by converting to electric standby.

In addition, there is substantially less wear and tear on electric units than their diesel counterparts, resulting in an extended life of the refrigeration unit of an eTRU and lower overall fleet maintenance.

Estimated maintenance savings have been calculated to be in the thousands per year. Case studies show that companies who have already switched to eTRU systems found their return on investment (ROI) more than covers the cost of conversion. Some companies report a 30 percent increase in the run life of a TRU including the benefits of alignment of purchasing cycles for TRUs and trailers.



Environmental Impact

eTRU technology is not only advantageous for a company's bottom line and planning, but also beneficial for communities that surround distribution centers. For each gallon of diesel fuel burned, 22.38 pounds of CO₂ are produced (U.S. Energy Information Administration). This contributes to greenhouse gas which leads to climate change and is a contributing factor to air pollution, causing harmful health issues to surrounding communities.



eTRUs allow refrigeration transport units to use electricity to run and cool loads while the unit is stationary, thus substantially reducing diesel emissions and helping our environment.



Legislation

California regulators are designing requirements for minimizing emissions from diesel Transport Refrigeration Units (TRU). As the California Air Resource Board (CARB) finalizes regulations for TRU's, it is expected that the requirements will also include all transportation refrigeration units operating within the state of California. Currently, 12 additional states are committed to the new requirements with many more states anticipated to join. Pending TRU regulations in California may restrict idling at applicable facilities to a maximum of 15 minutes by 2025 to help reduce the environmental impact of the trucking industry.

eTRU Incentive Programs

To assist with pending CARB regulations and help with this transformation, California electric companies are developing incentives to help with the installation of eTRU infrastructure. In addition to providing EV charging infrastructure, Southern California Edison, Pacific Gas and Electric, and San Diego Gas and Electric provide funding initiatives for installation of eTRU infrastructure to its commercial customers. Through these programs CPUC's goal is to advance the vision for a clean energy future while providing medium- and heavy-duty fleet owners the opportunity to save money.



Utility managed incentive programs offer opportunities such as, no-cost installation of electric infrastructure or giving businesses the option to install, own, operate and maintain the infrastructure on site for a rebate up to 80% of cost. California utilities are also offering special incentives such as commercial rate options that make EV charging and TRU shore power more affordable during certain times of the day.

California Air Resource Board

CARB's Clean Off-Road Equipment Voucher Incentive Project (CORE) features a streamlined voucher process for buyers to receive funding to offset the adoption costs of clean, commercial ready zero-emission equipment including transport refrigeration units, cargo-handling equipment, and more.

CARB is also offering eligibility opportunities to offset electricity costs through the Low Carbon Fuel Standard (LCFS) Program which is designed to encourage the use of cleaner low-carbon fuels in California, encourage the production of those fuels, and therefore, reduce greenhouse

gas emissions. Charge Ready Transport, LCFS and CORE are some of the many incentives available in California that provide opportunities to reduce your organization's carbon footprint all while cutting operation and maintenance costs to your fleet. For details on other state incentives throughout the country, contact your local electric company and ask what programs they have in place to help reduce your organization's carbon footprint and improve the air quality in your community.

eTRU CONVERSION

Converting to eTRU

Evaluating the conversion to eTRU means moving your fleet into the next generation of transportation technology. Doing a full cost and savings assessment to accurately predict how long it will take to get a return on investment (ROI) is encouraged.

To evaluate whether the eTRU conversion is economical and effective, review the points below:

1. Determine the electrical capacity for your eTRUs:

You will save substantially in fuel consumption by converting to electric standby power. However, your electricity consumption will increase. This shouldn't impact your return on investment but it's important to determine if the current site has the electrical capacity to handle the new load. Make sure you consider any facility upgrades that may be needed such as 3-phase power access at dock doors and trailer staging areas.

2. Evaluate current fuel and maintenance costs:

A major benefit of converting to eTRU is the stable lower priced cost of electricity. Electricity makes planning and budgeting much more predictable. In addition, idling electric motors have noticeably lower maintenance costs.

3. Determine equipment costs for eTRUs

Consider both the cost for existing and new equipment when converting to eTRU. Remember, there are costs associated with NOT switching such as:

- Non-compliance with future regulations
- Higher fuel costs
- Higher and more frequent maintenance costs on diesel engines

The above costs can be expensive and warrant the eTRU conversion.

eTRU equipment costs associated with switching that are often overlooked:

- The plug and wiring on the truck or trailer
- Labor to modify trailers
- Power infrastructure changes that may be needed
- Whether there will be a mix of 240VAC and 480VAC truck trailers that will require power

Electric Infrastructure

Evaluate these 5 questions to determine if your infrastructure is ready to go:

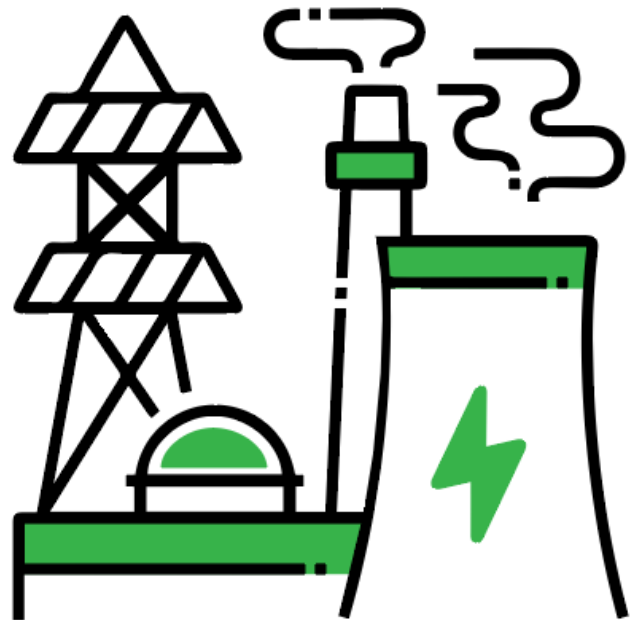
1. Do you have 480VAC three phase power on site?

If you don't have three-phase power, contact a qualified licensed electrician or your local utility company.

2. How much capacity do you have?

If you're not sure on your power capacity, your local power company can help. Let them know how many refrigeration trailers on electric standby you want to run and the amount of kilowatts of power needed, they will be able to determine if you have the capacity needed.

If you don't have enough capacity, talk to your power company about increasing it. To accelerate adoption of clean technologies, many local utility companies have instituted incentive programs to cover most or all of the cost to implement TRU electrification. Incentives vary depending on the utility company and US State; however, they may cover power stations, switchgear, trenching, wiring, project management and labor.



Step 3: Locate the locations where you will need power at your facility:

Determine where you'll need power at your facility. Will you be installing units at each dock door? In a parking or staging area? Establish where your current power runs, will this coincide with where you need your eTRUs?

Step 4: Determine the type of electrical feed:

Typically, eTRUs are powered either by 50A, 240VAC service, or a 30A, 480VAC service. You will need to determine which power service (or mixture of) that you will need along with the number of eTRUs that will be powered at any given time.

Step 5: Determine where you will mount your units

Once you decide where the power at your facility needs to be, make sure you plan out your mounting locations. Optional pole and pedestal mounting kits are available if your equipment will be in locations other than dock doors.

Are your trailers equipped with rear connection mounts?

Truck-trailer kits allow the user to connect the power cord to the backend of TRU trailers instead of at the refrigeration unit. A retrofit kit can be mounted on the underside of the trailer, providing a shorter connection distance to the docking station. This enables the added benefit of a safe break-away in case of accidental drive-offs in addition to easier cable management.