

Diesel Emissions Reduction Act (DERA) Transport Refrigeration Unit (TRU) Factsheet

What is a “reefer?”

Refrigerated, insulated cargo trailers, straight trucks, intermodal shipping containers, and rail cars can all commonly be referred to as “reefers.” It originates from the word “refrigerated.”

What is a “TRU?”

A Transport Refrigeration Unit (TRU) is a refrigeration system installed on insulated cargo trailers, straight trucks, intermodal shipping containers, and rail cars used in transporting temperature sensitive goods. A conventional TRU is powered by a small diesel engine.

Truck TRUs are used to refrigerate insulated cargo vans mounted on the frame of a straight truck. Trailer TRUs are used to refrigerate insulated trailers mounted on semi-trailers. Railcar TRUs are used to refrigerate insulated railcars.

What is an “eTRU?”

Electric Transport Refrigeration Unit or “eTRU” is a term sometimes used to describe different types of alternatives to conventional diesel-powered TRUs including hybrid electric TRUs, standby electric TRUs, and all-electric TRUs. In an eTRU, the refrigeration system’s compressor is driven by an electric motor all or at least part of the time. eTRUs can be powered by a plug-in electrical connection from electrical grid power (commonly referred to as shore power) while parked or being loaded. eTRUs may be powered by a battery pack for shorter distances or a diesel-powered TRU generator set for longer distances while operating on the road. Integral diesel generators, engine-mounted or transmission power-take-off generators, or other range extenders may also be used to provide electrical power to the unit when in transit.

Refrigerated shipping containers typically employ all-electric TRUs powered by ocean-going ship electrical power, dock-side shore power, or TRU generator sets for traveling shorter distances. Often, insulated trailers with shore powered all-electric TRUs are used for stationary operations to increase holiday and summer season cold storage capacity at grocery stores.

Hybrid Electric TRU

In a hybrid electric TRU (also called a hybrid plug-in eTRU), the refrigerator’s compressor is driven solely by an electric motor. When operating over-the-road, electric power is supplied by an integral diesel genset located within the TRU housing; when stationary (e.g., loading at a distribution center), the hybrid electric TRU plugs-in to available electric grid shore power.

Standby Electric TRU

In a standby electric TRU (also called a standby plug-in eTRU), the refrigerator's compressor is both mechanically driven by an integral diesel engine and electrically driven by an integral electric motor. When over-the-road, the unit is powered by the diesel engine; when stationary, the electric standby feature allows the TRU to be plugged into electrical power and the diesel engine to be turned off.

What is a TRU generator set (genset)?

A TRU genset provides electric power to an all-electric TRU when the unit is not plugged into ocean-going ship electric power or dock-side shore power.

- "Pin-on" TRU gensets are pinned onto the front of refrigerated shipping containers, just above the container's built in all-electric refrigeration system.
- "Under-slung," or "belly mount" TRU gensets are clamped to the frame rails of intermodal trailer chassis.
- A "powerpack" TRU genset consists of several diesel generators installed into a shipping container, which then provides electric power to multiple refrigerated shipping containers and are generally limited to railcar use and longer periods of transport.

What types of TRU projects are eligible under DERA?

Diesel-powered TRUs and TRU gensets are eligible as nonroad equipment under DERA if the existing engines meet the ownership, usage, and remaining life criteria defined in the program specific Notice of Funding Opportunity (NOFO) or Program Guide. For current eligibility criteria, applicants must consult the appropriate NOFO or Program Guide that corresponds to the funding year.

Replacement Projects:

- *Removing the old, diesel-powered TRU from the truck or trailer, scrapping it, and installing a new TRU, electric standby TRU, hybrid electric TRU, or all-electric TRU; or*
- *Scrapping the entire TRU-equipped trailer or shipping container and purchasing a new trailer or shipping container with a new, eligible TRU, eTRU, electric standby TRU, or hybrid electric TRU; or*
- *Scrapping a TRU genset and installing a new TRU genset*

Funding levels and cost share requirements, including any distinctions for zero-emission equipment (e.g., units that operate solely on grid, battery, or other zero-emission power sources), are established in the applicable NOFO and Program Guide and defined in the grant Terms and Conditions.

Electrified Parking Space (EPS) or Truck Stop Electrification (TSE) Projects:

EPSs provide off-board electrical power to operate a plug-in capable refrigeration system that would otherwise be powered by an engine. To address long duration idling and engine operation, eligible costs include the purchase and installation of certain equipment required for power delivery directly with a verified technology, design and engineering, electrical panels, upgrades to existing electrical panels or electrical service, wiring/conduit, and installation. Ineligible costs include power distribution to the property line, electricity, operation and maintenance, stationary energy storage systems that power the equipment (e.g., batteries) and their installation, and on-site power generation systems that power the equipment (e.g., solar and wind power generation equipment) and their installation. An EPS project may

be implemented as a stand-alone project, as described above. Or an EPS project may be implemented in combination with the replacement of TRUs with electric standby TRUs or hybrid electric TRUs.

Please note that although DERA grant funds and matching funds cannot be used for stationary energy storage systems that power the equipment (e.g., batteries) and their installation, and DERA grant funds and matching funds cannot be used for on-site power generation systems that power the equipment (e.g., solar and wind power generation equipment) and their installation, applicants and their partners may add these components at their own expense outside the scope of the grant.