



November 8, 2021

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Thermo King Comments on Proposed Changes to the California Air Resources Board Fiscal Year 2021-22 Funding Plan for Clean Transportation Incentives

Dear Mr. Christensen,

Thermo King would like to thank the California Air Resources Board (CARB) for the opportunity to provide comments on the FY 2021-22 Funding Plan for Clean Transportation Incentives. CARB has consistently provided an opportunity for stakeholder engagement and feedback to shape and refine programs to ensure they are meeting their intended purposes—a process we strongly respect and admire.

As CARB discusses changes to the Clean Off-Road Equipment Voucher Incentive Project (CORE), we would like to provide some insight for your consideration.

Thermo King is the global leader in transport refrigeration owning almost 70% of the US market share. Thermo King provides solutions for all kinds of transport refrigeration units (TRUs), including: vans, trucks, trailers, railway trucks, air, sea-going, and intermodal containers. Thermo King is committed to reducing TRU emissions and accelerating deployment of cleaner technologies by developing new and reliable eTRU equipment for its fleet customers.

Please see below for Thermo King's comments to the California Air Resources Board's CORE program.

Add Language to Support Chassis Integrated eTRU technology

The current CORE Implementation Manual does not have a section referencing TRU types that are directly integrated with the chassis. For instance, Attachment A, Section A, Part 3.f of the CORE Implementation Manual explicitly asks for information on energy storage systems, i.e., batteries/fuel storage packs. Thermo King's truck product eTRU does not have its own battery/fuel storage packs.

In order to understand Thermo King's system, it is first important to distinguish between two types of TRU technologies:

1. **Vehicle Powered:** Usually class 1-5 vehicle TRUs where the compressor is driven by the vehicle engine
2. **Self-Powered:** Usually for larger class 6-8 vehicle TRUs where the TRU has its own engine

Thermo King is striving to remove the engine component from the eTRU equation, and instead replace it with an electric architecture that allows for TRU integration with vehicle chassis. **Thus, the incremental costs in this case can be attributed to two main factors:**

- 1- **Cost of power electronic components and the absence of economies of scale, especially with the current shortage of electronic components in the market.**
- 2- **Designing, manufacturing, and implementing an all-electric architecture and integrating it with the chassis of a vehicle.**



Thus, costs associated with new components required to integrate the eTRU into the chassis fuel tank or electronics system and the design of the all-electric architecture should be encompassed in the “incremental costs” that the vouchers are designed to cover, and the equipment should be viable for funding under CORE.

Thermo King would like to urge CARB to develop language that will enable chassis-integrated technologies more explicitly, to avoid future ambiguity. Additionally, Thermo King recommends revising Attachment A, Section A, Part 3.f, Part 4, Part 5, Part 7 and Section B, Part 7, in addition to any part of the manual referencing battery/fuel storage packs to accommodate eTRU technologies that are designed to be integrated with the vehicle chassis and do not have their own battery/fuel storage pack.

Define Product Delivery

Current language in the CORE Implementation Manual qualifies product delivery and subsequent redemption of the voucher as when the product has been delivered and the purchaser has made final payment to the dealer. The process of purchasing a chassis-integrated eTRU, however, does not fit within this definition as the unit must be installed onto the vehicle directly at a dealer, manufacturer, or upfitter. This makes the final delivery of a chassis-integrated eTRU and subsequent redemption of a CORE Voucher dependent on the timeline of the vehicle chassis, which is outside of Thermo King’s control.

Thermo King recommends amending the language in Section H.1.c to allow for the following:

- 50% redemption of a CORE voucher when the eTRU is delivered to the dealer, and redemption of the remaining 50% of the voucher upon installation of the unit onto the chassis and subsequent delivery to the customer.
- Requirement of customers who apply for a CORE voucher to list the eTRU and Chassis OEM. Knowing the chassis OEM ahead of time will ensure CARB knows the customer is purchasing from a reputable source who can deliver the product in a reasonable timeline.

It is the belief of Thermo King that TRU manufacturers should not be held responsible, and customers should not have their vouchers in jeopardy due to the delayed schedule of a chassis OEM that is out of their control.

Set Upper Limit on Voucher Extension

Currently, the CORE Implementation Manual language does not specify an upper threshold for voucher extensions. At this point in the market, where eTRU technologies are still not commercially available at scale, and most manufacturers are still in the mid to late stages of research and development, it is important to specify an upper limit for voucher extensions and identify opportunities to speed up commercialization of new eTRU technologies. ***We want manufacturers to deliver products on time, and avoid scenarios where OEMs take advantage of extensions to apply for vouchers for products that they have no capability of delivering at the referenced time.***

Consequently, we suggest setting a two quarter/6-month threshold on extensions, beyond the one-year period from the date of the original voucher request, for product delivery and voucher redemption.

Divide Funding Periods

Considering the rapid pace at which eTRU OEMs are developing and deploying new technologies, we need to ensure sufficient funding will be available as new eTRU technologies come eligible for CORE.



Thermo King suggests dividing funding waves into a more granular schedule to cover two periods of a given year. Ultimately, this helps in speeding up the commercialization and deployment of eTRUs.

Add Another Tier for Single-Temp vs. Multi-Temp eTRUs

Current regulation shows no distinction in eTRUs on the temperature zone level, but only separates based on chassis support (Truck vs. Trailer). Existing eTRU technology is limited to single-temperature zones; however, developments are being made in multi-temperature zone applications. Incremental costs associated with the development of large multi-temp TRUs, specifically for class 7-8 trailers, are substantially higher compared to single-temp units. **Thus, Thermo King recommends adding another tier for single-temp vs. multi-temp eTRUs in the Implementation Manual Language, and explicitly separate funding based on the single-temp and multi-temp distinction with a proportional increase in the cap based upon the increase in incremental cost for multi-temp technologies.**

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Thermo King works with the industry's leading fleets to deploy cutting edge transport refrigeration solutions. The fleets we work with in your state are interested in replacing their older TRUs with cleaner and more fuel efficient, less polluting options. We are eager to work with you and your team to advance the adoption of cleaner vehicle technologies. To that end, we would like to set up a call with your team to discuss the concerns described above. Please contact me to do so at chris.tanaka@trane.com or at 719-585-3906.

Sincerely,

A handwritten signature in black ink, appearing to read 'Chris Tanaka'.

Chris Tanaka
VP Product Management
Thermo King