

Carriers Meet to Discuss

BEST PRACTICES IN FUEL MANAGEMENT

*Reduce Speeds and Idling, Use Technology and Manpower for Fuel Savings;
Keep Rates & Fuel Surcharges Current*

SCTA convened a meeting of about 10 SCTA leaders a couple of years ago to discuss "Best Practices in Fuel Management" and to be briefed by the Executive Director of the SC Petroleum Council (state office of API) on the diesel fuel situation after the devastation of hurricanes Katrina and Rita and their (short and long term) effects on the Gulf of Mexico oil-producing region. A few of the hi-lights of the discussion are summarized in this document.

The Oil Market

- Carriers feel there's too much manipulation in the oil markets. They say the system of speculating and future trading contributes to artificially high prices. They also feel that consolidation in the oil industry, wholesaler and retailer markets have impacted competition and pricing. And they're frustrated by the federal government's lack of action in long-term planning and promoting the development of alternative sources of energy, oil exploration and refining capacity.

Here's what some of the smartest carriers tell us they're doing about it:

Cut-back on Idling

An idling truck can burn nearly one gallon of fuel per hour. The consensus is that fleets should eliminate as much idling time as their operation will allow.

- Executives agreed that only minimal engine idling speed (rpm) is necessary, and that higher rpm provides no real benefit or driver comfort.
- Newer engine vendors should be able to set the each engine so that the rpm's are set only as high as necessary.
- One executive explained his driver incentive/anti-idling program. He allows the truck to be set to run faster if the driver meets his overall mpg goal. So, if the driver reduces idling (net effect = increasing trip mpg) he "rewards" the driver by allowing his truck to run faster. Carriers should be able to work with their engine vendors to set engines for select speeds/parameters. Some vendors call these Driver Rewards Programs.
- To help with idling costs and fuel economy, some truck dealers sell a device, which is an in-cab heater about the size of half a loaf of bread. It costs about \$1,000 and is simple to install. It will provide heating (no cooling) for the cab and burns only one gallon of fuel over a 20-hour period.
- One executive suggested working thru engine vendors so as to eliminate the ability of the driver to adjust the engine-idle rpm through the cruise control button.
- Use of Auxiliary Power Units - Diesel and battery-powered units available from various after-market providers and some OEM's. Average diesel powered APU burns 1/10 of a gallon per hour. In addition to saving fuel, they reduce engine maintenance costs.

- Carriers and drivers can utilize truck plazas equipped with truck stop electrification systems that allow trucks to draw electrical power and in some cases heating, cooling, telecommunications, and Internet hookups from a ground source.
- Another suggested carriers make sure the cab is truly insulated.

Other Fuel Savings Strategies

Fuel savings are a key to profitability, if not now fashionable and patriotic. Here are a few observations from the group:

- Fuel optimization software is used by many fleets. Some desire that it be up-dated more often, especially with prices fluctuations at the thousands of fuel outlets changing like they are now.
 - One executive says that he has converted a full-time staff position to serve as a fuel manager, directing purchases for each and every truck driver through utilizing software and other up-to-the-minute, real time information. Their goal is to affect their point of purchase price (beyond what their contract price might be) as well as minimizing driver decisions in the fueling process. They admit that drivers may be lured by sellers offering cheap inducements. Many are involving dispatchers in the decision.
 - Some fleets set the maximum cruise control speed at a slightly higher speed than the allowable foot pedal speed to motivate the driver to use cruise.
 - Carriers are trying to educate and entice drivers to operate at lower speeds - 62 mph being the "ideal" - and many are offering fuel savings bonuses. They agree that drivers complain if they can't "pass the other guy" or make a hill. They also assert that engines today can make the grade adequately without gaining too much speed on the approach.
- **Reduced highway speeds** – A line-haul truck with 90% highway miles that reduces its top speed from 70 to 65 miles per hour could cut its annual fuel bill nearly \$1,500.
- Reducing speeds also reduces engine and brake wear, which cuts down the cost and frequency of maintenance service, and keeps revenue earning equipment on the road longer.
 - Any carrier can adopt speed management policies and practices at little or no cost. The most successful of which combine electronic engine controls with driver training and incentives.
- **Driver Training** – Effective driver training programs can improve fuel economy 5% or higher. Some report up to 20%. Savings techniques: progressive shifting, engine speed optimization, idle reduction, smoother braking and acceleration, speed control, and optimal gearing.
- **Weigh Station By-Pass** - Weigh station bypass programs, like PrePass, save roughly one half gallon with each successful by-pass, not to mention the fuel spent during stops, starts and idling associated with long weight station queues.
- **Improved Aerodynamics** – Improved aerodynamics of a typical line-haul truck by 15% could cut annual fuel use more than 2,000 gallons and save over \$3,500 in fuel costs.
- Tractor aerodynamics can be improved by adding integrated roof fairings, cab extenders, side fairings and air dams. New truck buyers can purchase aerodynamic models with streamlined profiles.
 - Trailer aerodynamics can be improved by minimizing tractor-trailer gap, adding side skirts and rear air dams, and arranging cargo and tarpaulins as low, taut and smooth as possible.

- Single-unit trucks can be improved with air deflector bubbles or by purchasing new streamlined models.
- **Automatic Tire Inflation Systems** – Retrofitting a line-haul truck with an automatic tire inflation system could save 100 gallons of fuel annually and reduce tire wear and maintenance.
 - Truck fleets that find it too difficult or expensive to monitor tire pressure on a regular basis should consider installing automatic tire inflation (ATI) systems on drive and trailer tires.
 - An ATI system used on a typical line-haul truck can generally pay for itself in just over two years, while decreasing the risk of expensive tire failure caused by under inflation.
 - **Single Wide-Base Tires** – Specifying single wide-base tires on a new combination truck could save \$1,000 immediately and reap annual fuel savings of 2% or more.
 - Single-wide base tires save fuel by reducing vehicle weight, rolling resistance and aerodynamic drag. These tires can also improve tank trailer stability by allowing the tank to be mounted lower.
 - There are several wide-base tire models from which to choose and these tires can be retreaded.
 - **Low-Viscosity Lubricants** – When used in a line-haul truck, synthetic engine and drive train lubricants can improve fuel economy by 3%, saving nearly 500 gallons of fuel.
 - Synthetic or semi-synthetic lubricants flow more easily and withstand the extreme pressure of engine, transmission, and drive train systems better than conventional mineral oil blends.
 - The operator of a typical line-haul truck can save up to \$500 annually by switching to low-viscosity lubricants, with additional savings possible due to reduced wear and maintenance of truck systems.

Mileage Guides Need Up-Dating

They said PC Miler and Rand McNally to update their programs because their system miles vs. actual miles varies by some 7 – 10%. The result is that carriers are paid for less miles than they actually run and, thus, do not recover their total fuel and other operating costs. Some suggest they need to calculate by zip code. You might contact your vendor and make that suggestion.

A Call for Industry-Wide Slower Speeds?

Carriers agreed that in an ideal world, SCTA and all other trucking trade groups should call for a nationwide, all-comply lower speed operating policy. Say 62 mph maximum. That would save tremendous fuel, maintenance costs, level the playing field, improve safety, etc. But, again, that was if we were in a perfect world.

What are carriers doing about surcharges?

In individual discussions with members, SCTA hears that most smart fleets have been using discipline in enforcing, and now are even looking to change how often they update their fuel surcharges. Common practice has been to adjust weekly according to the Department of Energy Diesel Fuel Price for the week, but now carriers tell us that they are looking to reset them on the day of release on updated national price figures. Some carrier executives say they are looking at ways to change their contracts and adjust their processes/charges either on a daily, hourly or route basis because of the instability in supply, the volatility of fuel costs and because of the proliferation of taxes and tolls.

Who are the “best” customers?

What happens if fuel supplies and prices remain volatile? At some point, motor carriers are forced to decide how to adjust their pricing and operations so as to continue to service their “best” customers

and to let others go. Carriers tell SCTA that most of their customers are now fully realizing the extent of the problem and are cooperating with them to help them recover their increased costs because they know that industry carrying capacity is a major issue that could worsen over the near and long term. With weaker carriers failing under today's difficult conditions, the situation may get more challenging for shippers.

Rate vs. Surcharge?

We've seen it coming, and the storm settled it. The world of oil and fuel has changed – permanently. Up to now, fuel surcharges have been a survival strategy. Rates are part of an operating costs and profitability formula. Fuel is not the only major operating cost that has increased. With capacity likely to remain constrained and fuel prices certain to stay close to where they are, carriers might want to take a close look at their pricing models. That's about as far as we can go on this matter. Good Luck.

Bottom Line:

Carriers must express concern about this issue and the impact it is having on their operations and their customers – *with their elected officials and the Media!*

Write them. Call them. Send Letters To The Editor.

The American Trucking Associations asks that you register comments and concerns with them at www.truckline.com.

Your comments will have an impact on industry policy and lobbying efforts.

One thing is for sure, now is the time for carriers to do everything possible to become more fuel efficient, to educate drivers on the savings involved with slowing down and to implement reduced fuel speed policies and practices.

This should be the mantra for today's smart trucker.

***Share your strategies with us
and let us know what we can do to assist in these efforts.***

RESOURCES

- ❑ **U. S. Department of Energy's Energy Information Administration (EIA)** – The source for Official Energy Statistics from the US Government, including the Weekly Retail on-Highway Diesel Prices report.

EIA Web site: <http://eia.doe.gov/>

Department of Energy's Diesel Hotline: 202-586-9699

- ❑ **U. S. EPA's SmartWaySM Transport Partnership Program (See Appendix II for more details)** – The SmartWaySM Transport Partnership is a voluntary collaboration between U.S. EPA and the freight industry designed to increase energy efficiency while significantly reducing greenhouse gases and air pollution. SmartWay Transport Partners lead the way towards a cleaner, more efficient transportation future by adopting fuel-saving strategies that increase profits and reduce emissions – a “win-win” opportunity for all. The SmartWaySM web site is a great source for information about reduction of fuel consumption and emissions for the trucking industry that was used as a resource for development of this guide.

SmartWaySM Web site: <http://www.epa.gov/smartway/>

- ❑ **Diesel Technology Forum** – The Diesel Technology Forum is a non-profit educational organization dedicated to raising awareness about the economic importance and essential uses of diesel engines, highlighting the continuous improvements in fuel efficiency and emissions reductions, continuous progress to reduce the environmental impact of the existing fleet of diesel engines, and leading the way for future clean diesel technology in all applications.

Since it was founded in 2000, the Forum has emerged as a leading information source on clean diesel and energy issues, and its leadership regularly participates in legislative and regulatory deliberations, technology demonstrations, and industry and media events. The Forum brings together a broad range of diesel stakeholders including diesel users, public and environmental interest groups, and government regulators to encourage the exchange of information, findings and ideas about the current and future use of diesel technology. Elected officials, regulators, members of the media and other opinion leaders count on the Forum for data, insight and expert commentary.

The member groups involved in the Forum include leading vehicle and engine manufacturers, key component suppliers, petroleum refiners and makers of emissions control devices.

Diesel Technology Forum Web site: <http://www.dieselforum.org/>

- ❑ **American Trucking Associations (ATA)** – ATA has established a special Fuel Price Crisis section on its web site to collect first-hand reports from carriers about the fuel problems they are facing and how they are coping with the impact of rising fuel costs on their business. It contains information about what ATA is going to address the issue and work

toward a solution. The site also provides a sample letter to the editor for you to send your local media and an electronic tool to facilitate your communications with your Members of Congress.

ATA Web site: www.truckline.com (click on Fuel Price Crisis)

- **CREDIT** – We also wish to thank the Virginia Trucking Association for their improvements to this original SCTA document. SCTA has incorporated select resources as incorporated into the subsequent VTA guide.

LIST OF APPENDICES

APPENDIX I - *Idling Reduction Technologies* compiled and published by the SmartWaySM Transport Partnership Program, U. S. Environmental Protection Agency.

APPENDIX II - *SmartWaySM Transport Partnership Overview* published by the U. S. Environmental Protection Agency.

APPENDIX I - Truck Idle Reduction Technologies

Published by the SmartWaySM Transport Partnership
U.S. Environmental Protection Agency

Mobile

Automatic Shut-Down/Start-Up Systems

Note: All electronic diesel engines are capable of shutting down the engine after a set time period. This requires manipulating the engine control module which can be done at very little cost by the truck dealer, engine manufacturer, or truck owner.

- **BBW, Inc.**

www.idlesmart.com (888) 522-9462 or (785) 457-3968

"IDLE SMART" is a patented, programmable, electronic control system that monitors temperatures inside and outside the truck. It automatically starts the engine, increases engine speed for maximum efficiency, monitors system, heats or cools the cab, idles down the engine, and shuts the engine off. The total weight of the system, after installation, is 30 pounds. Retail cost: \$3,750.00. Installation takes 5-7 hours. "IDLE SMART" is transferable between vehicles and is adaptable to electronic and manual governed engines.

- **Cummins Engine Company, Inc.**

www.cummins.com/na/pages/en/products/powergeneration/index.cfm (812) 377-5000

Cummins manufactures the ICON system that automatically controls engine starting and stopping for the purposes of reducing excess idle time and maintaining engine temperatures. It has 3 modes of operation: engine, cab comfort, and mandatory shutdown. Under engine mode, the system monitors engine oil and battery voltage. If either drops below a set level the engine is automatically started. Under cab comfort mode, a cab thermostat starts and stops the engine to maintain the desired temperature. Under mandatory shutdown mode, the engine will shut down after 5 or 15 minutes. Cost: \$1,325

- **TAS Distributing, Inc.**

www.tempastart.com (309) 691-0919

First introduced in the 1980's, Temp-A-Start is the original start/stop technology for truck diesel engines and licensed to Detroit Diesel and Cummins Engine Company. The system provides for driver comfort and reduced service calls while eliminating unnecessary idling. Temp-A-Start is a mandatory engine shut down that also turns off all electrical accessories controlled by the ignition switch. It monitors battery voltage and, when a low voltage condition occurs, it will start the engine and charge up the batteries. In engine mode (the default mode) Temp-A-Start monitors engine temperature and starts the engine when oil temperature drops to 55 degrees and shuts the engine off when oil temperature reaches 135 degrees. In zero degree weather, Temp-A-Start typically will run the engine a 2.2 hours during a 10 hour period for a 78% off time. In the sleeper mode, Temp-A-Start will start and stop the engine to maintain the temperature set by the driver on the Temp-A-Start thermostat installed in the sleeper. At this time, Temp-A-Start can be ordered with new Volvo trucks and International will pre-wire for Temp-A-Start. The total installed weight of Temp-A-Start is less than 14 pounds. Customers have used the same control modules in three and four successive trucks. The installed cost plus sales tax for Temp-A-Start is typically less than \$2,500.00. The cost of installing the control modules in a successor truck would typically be less than 40% of the original cost.

Battery Powered

- **Autotherm Division Enthel Systems, Inc**

www.autothermusa.com (847) 726-1717, ext. 12

Autotherm produces the T-2500 Energy Recovery System (ERS) which keeps the inside of a vehicle cab warm in the winter for up to 4 ½ hours by allowing the cab heater to function normally with the

engine off. It accomplishes this by continuing to circulate the heated coolant from the engine to the heater coils at 3 gallons per minute with the engine shut down. This same action provides Controlled Engine Cool Down that forever eliminates damage done by "Hot Spots" in the engine. Since the ERS runs off the vehicle battery, the only added weight to the vehicle is the 5 lbs the ERS weighs. It burns no fuel, emits no pollutants and draws less than one amp from the battery. Since the cab heater functions the same as it does when the vehicle is running the amount of heat (BTU's) going into the cab will be the same. The Central Control Unit is installed in the cab and the pump is installed under the hood. The total installation time is less than 3 hours and once installed it never requires maintenance nor creates safety issues. The ERS has a temperature sensor built in that shuts Autotherm down when the coolant reaches 95° F. It also has a voltage sensor that shuts the ERS down when the battery reaches just above 50% discharge. It does not provide air conditioning. Pump Warranty -life of installation -Other parts - 2 years. Cost: under \$550.00.

- **Bergstrom Inc.**

www.nitesystem.com (866) 204-8570

This company manufacture the No-Idle Thermal Environment (NITE) system which provides air conditioning and heat, but uses a battery pack to supply the power (it uses two deep cycle 6V batteries connected in series to provide 12V). The NITE system combines a fully independent air-conditioning system and a compact air-heating system with a smart control system and a self-contained power source. Both are installed under the bunk bed in the sleeper compartment. When fully charged, the batteries provide 10 hours of full operational use. It takes 4-6 hours to recharge. Total weight 210 lb (including the two batteries). It does not require major maintenance and installs within 7-9 hours. Cost: \$3,495

- **Driver Comfort System**

www.drivercomfort.com, 479-409-4651

The Driver Comfort System provides air conditioning and heat for the entire cab, and power for on-board appliances. The device also incorporates a shore power connection that can be used at electrified parking spaces and to recharge the system batteries. The system includes 6-8 AGMVRLA (Absorbed Glass Matt Valve Regulated Lead Acid) batteries, one 3000 watt inverter/charger, one 270 amp alternator, one advanced system voltage management controller, one battery separator switch, and one cab thermostat. The evaporator fits securely inside the cab under the bunk. Conditioned air is directed via ducts to ensure even distribution throughout the cab. Heat is provided by a fuel operated heater or an optional electric heater. The condenser/compressor is mounted on the cab back wall. Compressor options allow for 9,200 to 15,000 Btu, and electric heat up to 8,000 Btu is also available. The system measures 26" (L) x 24" (H) x 11" (W). It weighs 520 lbs and costs \$6895.00.

- **Idle Free Systems, LLC**

www.idlefree.net (920) 210-5467

Idle Free Systems, LLC manufactures the Reefer Link System which connects the truck and trailer together electrically to provide the driver multiple options for power (tuck engine, transportation refrigerator unit, or both). While driving, this Reefer Link System stores the truck's 12 volt battery energy in an AGM (Absorbed Glass Mat) battery bank located under the bunk. When the truck is not moving, the driver has the option of using the stored AGM battery power or the transportation refrigerator unit, if available and upgraded to 120 amps, as a power source. Either the AGM battery or the transportation refrigerator unit supplies power to operate a heating system (e.g., Espar heater) and air conditioning system (e.g., Dometic unit). This energy transfer is controlled and regulated using a Xantrex Prosine 2.0 inverter/charger. This inverter/charger has a built-in battery charger, as well as an automatic shore power transfer switch to utilize electricity. The Xantrex inverter/charger can be used to charge the AGM battery bank, the truck's batteries, and the transportation refrigerator unit battery when electricity (shore power) is available. The Reefer Link System weighs 200 lbs. and costs \$7995. The entire system consists of the following: 10,000 BTU Dometic Air conditioner; Espar D-5 Hydronic Heater; Xantrex Prosine 2.0 Inverter/Charger; cab power/shore power kit Reefer Link System with reefer alternator upgrade; and bunk mounted display panel with digital LED volt meter.

- **Kenworth Truck Company**

www.kenworth.com (425) 828-5000

The Kenworth Clean Power® no-idle system is a comprehensive battery-based solution that provides engine off heating and air conditioning, 120 Volt AC power for hotel loads, low power

interior lighting, enhanced sleeper insulation and a shore power connection. The system operates at ambient noise levels with only pumps and fans running during no-idle. While the truck is driving down the road, a high-powered alternator charges the power pack and the starting batteries. In hot weather, the power pack runs an electric refrigerant compressor in the AC charge unit. This compressor, in turn, charges the storage cooler. This provides the thermal storage capacity for providing air conditioning. The cooler has a thermal capacity of 21,000 BTUs and requires only 4 to 6 hours of charging to provide up to 10 hours of cooling in a 95 degree, low-solar load environment. Conversely, in cold weather electrical loads are once again supported by the power pack and sleeper heat is provided by the diesel-fired heater. The heater is capable of maintaining a comfortable environment down to 20 degrees F. Their system measures (LHW) 38-3/4" x 35" x14" (storage cooler), and weighs 550 lbs (net weight gain). For cost, (Kenworth factory installed only), see Kenworth Dealer for pricing.

- **Safer Corporation**

www.saferco.com (877) 777-2337

This company distributes a product called "Viesa," an Evaporative Cooling System for trucks, buses, RVs and vans. The device uses the vehicle's 12 or 24 volt battery and water to cool the cab without the use of the vehicle's engine. No fuel is consumed. The device does not provide heat or electrical power and operates best in hot, dry climates, under 60% humidity. Viesa uses a maximum draw of 8 amps per hour in a 12-volt system and can operate for up to 8 hours without idling. Water consumption averages 1/2 gallon per hour and the tank will hold 32 liters (8 1/2 gallons). Total weight is 126 lbs with a full water tank. System comes with a 2-year warranty. Cost \$1,600 Installed.

- **Sun Power Technologies**

www.sunpowertech.com (800) 876-6117

Sun Power Technologies manufactures a complete, self-contained, battery system and couples it to a 10,000 BTU air conditioner manufactured by the DC Airco Company and an optional 10,000 BTU diesel fired heating system. This complete system is powered by a 420 amp hour Absorbed Glass Mat (AGM) battery. The AGM battery has an integral electronic circuit that ensures the appropriate charge profile by controlling the output current and voltage. The system recharges from a standard engine alternator in 4-5 hours and consumes a maximum of 46 amps per hour at 12 volts DC. The air conditioner operates for 8-12 hours when batteries are fully charged. The entire system can be installed in 4 hours. The system weighs 440 lbs and costs \$6,900.

Fuel Operated Heaters

- **Automotive Climate Control (ACC)**

www.accclimatecontrol.com (574) 264-2190

This company manufactures and installs mobile heating systems supplying OEM and aftermarket customers in the truck, bus, van, emergency vehicle, specialty truck, off-highway, and small cab markets. They offer two models of air-to-air battery-powered fuel fired heaters. These heaters (2 kW-4 kW) heat the cab only. The standard package includes heater, electric pump, cable harness, intake silencer, exhaust device, and all other parts required for installation. 12 VDC or 24 VDC versions are also available. Both heaters can be equipped with either manual or automatic control. The heaters can be controlled by a timer in two ways - manually or by pre-setting. The timer can be set for up to seven days and up to three times a day to pre-set the cab pre-heater. Heaters can be operated in its full heat capacity or by automatic temperature control that allows maintaining a comfortable cab environment. One unit uses about a gallon of fuel for 24 hours period and the other uses about a gallon for 12 hours both at average capacity. Heaters can be installed in the tool or luggage compartment, or under the chassis. 2 year warranty. Cost: \$920 - \$1,200 including automatic control.

- **Espar Heater Systems**

www.espar.com (800) 387-4800

Espar currently produces six models of battery-powered heaters for use on highway trucks. Four of the models heat the air to maintain a comfortable driver environment with the engine off. Two of the models heat the engine coolant for cold weather starting. These heaters can also provide cab heat through heat exchangers in the cab. Standard on all heaters are fully integrated numerical

diagnostics, low and high voltage safety cutouts, and automatic heat range cycling to maintain a warm comfortable environment. The four cab heaters use about a gallon of fuel for a 20 hour period, and the engine heaters use about a gallon for a 4-6 hour period. Installed in the tool or luggage compartment. A seven-day timer available to preset the engine pre-heater. Additional products exist for other types of vehicles (e.g., school and transit buses). 3 year warranty. Cost: \$1,000-\$3,000

- **Webasto Product North America, Inc.**

www.webasto.us/oem/en/oem_trucks.html (800) HEATER1 or 432-8371

They have two air heater products for cabin air and three products for coolant heating. The two battery-powered air heaters are the Air Top 2000 and Air Top 3500. Both heat the cab only. It is installed typically under the bed in the sleeper cab. The heater takes in cold cabin air, heats it up, and blows it back into the cab. The temperature is thermostat controlled. They can operate for 20 hours on one gallon of fuel, and after start-up battery draw is 2 amp/yr. The engine heaters are the TSL 17, Thermo 90S, and DBW 2010. They utilize an evaporative burner allowing variable Btu output. They can be installed in the engine compartment or frame rail. Installations can take from 2-4 hours. Fuel consumption ranges from .03-.24 gph. The heater is integrated into the coolant loop of the engine and preheats the engine. The burner concept is the same as in the Airtop 2000. Additional products exist for other types of vehicles (e.g., school and transit buses). 2 year warranty. Cost: \$1,000-\$3,000

Auxiliary Power Unit or Generator Set

- **Auxiliary Power Dynamics, LLC**

www.auxiliarypowerdynamics.com (800) 825-4631 (Option #2) or (253) 638-3145

They manufacture an auxiliary power unit that contains an alternator, an A/C compressor and a heat exchanger for circulating coolant. The Willis APU's options include an air compressor, air starter, oil pump for pre-lubricating the engine and a 1,750-watt inverter for AC (110) power. By using all of these options, a truck operator would be able to eliminate the truck's electric starter and most of its batteries. The Willis APU uses less than a quart of fuel per hour to cool a truck cab or a pint of fuel per hour to heat a truck. Cost : \$7,900

- **Black Rock Systems**

www.BLACKROCKAPU.com, (775) 849-1116

Black Rock manufactures two APUs. Both models are stand-alone units without an interface to the truck's HVAC system which can provide back-up emergency power for the truck driver in case of truck engine failure. Their first model is a 2 cylinder Yanmar engine. This model has a "Smart Power Management" system which balances the load between the HVAC and power generation to provide the most effective air distribution. The 2 cylinder model weighs 455 lbs, and measures 29.5" W x 28.5" H x 30" D. This model consumes 0.20 gallons of fuel per hour. The second model is a 3 cylinder Yanmar engine. The 3 cylinder is designed for very large sleeper compartments with high AC and electrical output needs. This model weighs 510 lbs, and has the same dimensions as the 2 cylinder. This model consumes 0.30 gallons of fuel per hour. Both models can produce 26,000 BTUs of AC and heat. Generator options come in 3.7 kW, 5.2 kW, or 6.0 kW. Both models come with an AC-powered block heater. The oil service interval is at 1,000 hours of use. The APU comes with a warranty of 4,000 hours of use or 2 years. The Yanmar engine comes with a warranty of 4,000 hours of use or 3 years. The models cost from \$7,499 - \$8,100 (plus installation).

- **Carrier Transicold**

www.trucktrailer.carrier.com (706) 357-7223

The ComfortPro™ APU provides heating and air conditioning for the sleeper cab, 60 amps of truck battery charging, 110/120V household electrical power for appliances, and truck-engine warming. Key features include start/stop operation and Winterwatch™ protection to keep the engine warm during extreme cold when the cabin is unoccupied. Options include automatic low-battery-voltage protection and shore power, which allows for heating and air conditioning by running an extension cord to the truck without operating the generator. The ComfortPro APU directly powers its cooling and heating system and all household appliances from its 4,000 watt generator driven by the unit's Kubota diesel engine. For air conditioning, the unit employs a sealed electric-powered compressor for increased reliability and uses industry-standard R-134a. Regular maintenance is recommended

every 1,000 hours. It consumes about 0.2 gph under full-load. It takes approximately 16 hours to install and has a 2-year warranty (all parts and labor) through Carrier's North American sales and service dealer network.

- **Comfort Master**

www.comfortmaster.com (866)610-8890

The Comfort Master APU of 2007 provides heating and air conditioning both at 31,000 BTU's, using an Isuzu 3 cylinder diesel engine. The electrical power is 3,000 watts, and 120 Volt for accessories. The unit also provides shore power capability (it will power all 120 volt accessories and battery charging will be functional). The unit comes complete with an inverter with built-in high-amp 3-stage battery charger and conditioner/maintainer for longer battery life. The APU is a stand-alone system. It will only connect to the truck's fuel and battery source. The system has an exclusive engine computer with auto start (for low battery recovery), lifetime air cleaner, and electric fan for faster warm-up and cooling. The radiator and condenser are incorporated into the unit. The unit includes bulkhead fittings for faster connection and installation. It has a low 1800 rpm for more efficient fuel consumption. Over 2,000 service and repair facilities exist. The unit has a super quiet enclosure (63 dB at 21 ft under full load), and the dimensions are 24" x 29" X 24" off the railing of the truck. The under-bunk evaporator measures 16"W x 16"L x 6"H. Weight is 400 LBS. Average fuel consumption is 1/4 gallon per hour at full load. It takes an average of 5-8 hours for install and has a 2-year warranty (parts and labor). Cost: \$7,200 without inverter; \$8,100 with an inverter.

- **Craufurd Manufacturing, Inc.**

www.craufurdmanufacturing.com, (413) 323-4628

Craufurd manufacturers a tour bus idle reduction system, the Universal Bus Anti-Idling System. The system consists of two custom-designed, stand-alone electric air conditioning and heating units with a capacity of 22,000 BTU for both cooling and heating. The system is operated by an external 115vAC 30 Amp power supply (sold separately). The cooled or heated air is delivered by a 6" insulated duct that is directly incorporated into one side of the buses' ducting. The units are placed into the baggage storage area next to the main heating/AC unit. The unit also supplies power to the lighting onboard the bus. The unit dimensions are 30" W x 28" H x 18" D, and it weighs 150 lbs. The system costs \$5,000.

- **Double Eagle Industries**

www.doubleeagleind.com/gen-pac.htm (219) 768-4121

Their idle control product is called the Gen-Pac which provides heat and air conditioning for the cab, heat for the engine, and DC electrical power for main battery charging, lights and accessories. The air conditioning is an optional item and it is merged with the main truck's engine. The unit consumes about 0.3 gph. They encourage all three types of installations to be made at their facility in Shipshewana, Indiana which can take from three to five days. Typical maintenance involves servicing the engine every 200-250 hours (includes oil, fuel, and air filter changes). Cost: \$7,000-\$9,000

- **Flying J Inc.**

www.fjesolutions.com, 800-501-7279

Cab Comfort System "CCS", offered by Flying J Inc., is a result of over 15 years of APU design and manufacturing in military and industrial industries. It is powered by a rugged Kubota 2-cylinder liquid-cooled diesel engine directly driving a 6kW generator, producing electric air conditioning and heating with 115 VAC receptacle outlets inside and outside the sleeper. The system can be independent of temperature or integrated with the truck engine cooling system while monitoring battery voltage and engine coolant to ensure ultimate system performance and cold weather starting. The programmable self-monitoring system cycles on only when needed for conservation of diesel fuel and driver comfort. CCS is quiet and comes with a 2-year system warranty (3-year for major engine components). Options include high performance cooling, shore power, and keyless remote start. Complete basic unit price is \$6,999 and financing is available. The system measures 21" (L) x 28.8" (H) x 28.8" (W) and weighs 425 lbs.

- **Frigette Truck Climate Systems**

www.scsfrigette.com/html/products (817) 293-5313

This company has three products: two gen-sets and one APU. The gen-sets produce heat, air conditioning, and provide for electrical power. The APU provides heat and air conditioning only. All

three products operate independent of the truck's system. The heat and air conditioning units are placed under the bunk bed, and the actual gen-set or APU can be installed in the tool box or behind the fuel tank. 8-10 hours installation time. One year warranty. Cost: \$6,000-\$7,500

- **Gates Corporation**

www.gates.com 303-744-1911

The CabRunner™ Integrated Power System (IPS) is a simple non-invasive solution to idle reduction. The CabRunner IPS uses a diesel engine to drive a slightly modified Accessory Belt Drive System (ABDS). Seamless integration with the trucks existing accessory system provides heat, air conditioning, lighting and power for the tractor and trailer without adding additional maintenance items such as compressors and generators. The CabRunner IPS charges the trucks battery and heats the truck engine coolant to avoid cold starts. The transparent system allows drivers to use the existing in cab controls to operate cab comforts and since the system uses existing components it does not take up storage space underneath the bunk area. The CabRunner IPS weighs 385 pounds and has an electrical output of 90 amps with a heating capacity of 10,500 Btu/hr. The air conditioning capacity is equivalent to the trucks main engine BTUs/hr. CabRunner IPS reduces idling fuel consumption by 60%. The CabRunner IPS MSRP is \$7,200.

- **Idlebuster**

www.idlebuster.com 727-569-6000

The Idlebuster provides cab heating and air conditioning, truck engine block heating, truck battery charging, and internal/external 110V on-board power. Standard features include an independent starting battery, double vibratory shock mounts, shore power receptacle and an automated fire suppression system. The Idlebuster can be equipped with autostart technology for unattended maintenance of battery charge and/or cab temperature. The included Dometic HVAC system is independent from the truck system and is mounted under the bunk. The APU mounts to the frame rail, and installation time is 5-6 hours on a clean rail at an Idlebuster Factory Installation Center. The unit weighs between 435 and 450 pounds depending on configuration. The unit sells for \$6,900.00 USD, \$7,750.00 USD installed (24" clean rail). Lease programs are available, as is a 36 month extended warranty that also includes oil and filter changes.

- **Kohler**

www.KohlerPower.com 800-544-2444

Kohler offers two APU products – the Kohler 3APU-HC and the Kohler 7APU. The economic Kohler 3APU-HC (\$7300 installed) operates quietly (<69dBA), and is extremely compact (12" W x 24" H x 28"D) and light (240 lbs). It can heat (10,000 BTU/hr) and cool (12,000 BTU/hr) the truck's cab as well as recharge the truck's battery. Because no components are required to be mounted under the bunk, the Kohler 3APU-HC is a space-saver for today's trucks. The Kohler 7-kilowatt APU is one of the highest powered APUs on the market today. The APU provides 120-volt AC and 45-Amp DC power, enough power to run a variety of electronic equipment, such as TVs, microwaves, etc., as well as a block heater. The Kohler-branded, under-the-bunk HVAC system provides 14,000 BTU/hour of cooling and 2.5 kW of electric heating capacity. The 7APU is priced at \$10,500 installed. Both Kohler APUs allow the driver to start and stop the unit, and adjust the heating and cooling from inside the cab. Both APUs are completely independent of the truck's climate control system, which greatly reduces installation time. Kohler APUs feature an oil service interval of 500 hours to reduce standard maintenance costs, come with a two-year warranty and are supported with installation and service by Kohler's existing national distributor and dealer network - over 500 locations.

- **Kool-Gen**

www.kool-gen.com (979) 849-3773

Kool-Gen offers a model KG 1000 Universal Mount APU Unit that attaches to the truck frame. The manufacturer claims it will fit 90% of trucks. The model uses a Yanmar 2-Cyl Diesel water cooled engine which powers a 134A Freon A/C Compressor system. Their units come with A/C Compressor, 17,000 BTU Evaporator, remote mount A/C Condenser, A/C Hoses, A/C Fittings, Control Panel, wiring harnesses, and provide 3000 Watts 115V AC Current while using the A/C. It also has its own radiator to cool the engine. They also offer an optional 15 - 20,000 BTU for Heat. KG 1000 Cost: \$6,295.00.

- **Mechron Power Systems**

www.ccslightning.com, (888) 733-3858

Mechron manufactures the CCS Lightning Cab Comfort System which provides air conditioning, heat, and electrical power. They use a liquid cooled Kubota engine. It is rated at 6 KW, 115 VAC at 60 Hz. It weighs 360 lb, and measures 21" W x 28.8 H x 28.8 D. The unit consumes 0.21 gallons of fuel per hour and its service interval is 500 hours. Its compressor/heater/ evaporator/blower unit is a combined air-conditioning and heating package complete with a ventilation blower fan. The fan speed can be manually controlled. Standard heating capacity is 10,000 BTU/hr (high)/5000 BTU/hr (low), with 13,500 BTU/hr as an option. Cooling capacity is 10,000 BTU/hr with 14,000 optional. Contact the company for pricing.

- **Pony Pack, Inc.**

www.ponypack.com/products.htm (505) 243-1381

The Pony Pack provides heat and air conditioning for the cab, heat for the engine, and DC electrical power for main battery charging, lights and accessories. This system uses the truck's components, consumes about 0.2 gph, and can be installed in one to two days. The most common mounting scheme requires at least 24 inches of clear frame rail between the quarter fender and fuel tank on the passenger side. Typical maintenance involves servicing the engine every 150 hours (includes oil, fuel, and air filter changes). Cost: \$7,000

- **Rig Master Power (International Power Systems Inc.)**

www.rigmasterpower.com (416) 201-0040

The RigMaster Power is an independent, stand-alone device which is not integrated into the truck engine heating and cooling system. It provides heat and air conditioning to the cab, heat to the engine, and electrical current for appliances and power tools. The bunk heater/air conditioning unit mounts inside the bunk with two "house current" 110 V receptacles. The main unit mounts on the trailer's rail. It consumes about 0.2 gph and can be installed in one to two days. Usual maintenance is required (oil and filter changes, air and fuel filter replacements). Leasing programs are available. Cost: \$6,300

- **Star Class, Inc.**

www.starclassinc.com (724) 654-4665

Star Class manufactures two APU units: GEN-STAR 4500 and GEN-STAR 6000. Both are stand-alone, independent systems. The 4500 model contains a Perkins engine, 1950 RPM, 6.5 KW Peak, 4.3 KW A.C., 45 AMPS D.C., and a 2-year limited warranty. It weighs 287 lbs, and costs \$5995, excluding installation costs. The 6000 model contains a Lombardini industrial engine, 1800 RPM, 7.8 KW Peak, 5.5 KW A.C., 65 amps D.C., and a limited 3-year warranty. It weighs 335 lbs, and costs \$6500, excluding installation costs.

- **Thermo King Corporation**

www.thermoking.com (952) 887-2200

Thermo King offers a TriPac APU that provides cab heating and air conditioning, truck engine block heating, truck battery charging, 12V on-board power, and optional 120V household electrical power. The system is powered by a diesel engine, which runs an automotive style 12V alternator and belt driven air conditioning compressor. The APU HVAC system, rated at 13,000 Btu/hr air conditioning capacity using ARI Standard 310/380, is independent from the truck system. Cab heat is provided by a fuel-fired heater, and engine block heat is provided by exchanging coolant between the APU engine and the truck engine. 120V accessory power is provided by inverting the 12V truck batteries and the truck batteries are charged with the automotive style 12V alternator. The system incorporates start/stop technology and a programmable microprocessor, to enable the system to turn off when all parameters are satisfied. The evaporator and heating system are mounted under the bunk, the condenser is on the rear cab wall exterior, and the APU is on the frame rail. Regular maintenance is required every 1000 hours. The system consumes between 0.04-0.14 gal/hr, depending on operating conditions, and weighs about 420 pounds. It sells for \$8,500 (\$8900) USD installed.

- **TRIDAKO Energy Systems**

www.TRIDAKO.com (866) 526-7109

Tridako Energy Systems manufactures the PowerCube™ Model HC6000. The PowerCube™ is an isolated, non-integrated truck gen-set. This 2-cylinder diesel APU provides 30,000 Btu of in-cab

heating, 24,000 Btu air conditioning, and 60 amp electricity which powers the engine block heater. The 2" tube frame chassis supports a radiator /condenser inside the main unit, allowing for a less cumbersome install. The PowerCube™ is SAE J-1503 certified and consumes .4 gal/hr. of fuel in powering a 6 kw generator at 3600 rpm. The main case has removable side panels, measures 30"x 23.5"x24", and mounts to the truck frame rail. Weight is 500 lbs. The MSRP is \$8,499 with quantity discounts available. Lease financing packages are available.

- **Truck Gen**

(904) 642-0836

They have three units: 3.5 kW, 5.5 kW, and the APU. The first two are true generator systems which are stand-alone with no integration into the truck's systems. Each generator package provides 120V AC power to run any AC appliances as well as factory block heaters. Air conditioning and heat are provided with one of 2 installations of electrically driven air/heat units: rooftop, or under the bunk. The generator systems are small enough to fit into many battery or tool boxes, thereby reducing the weight from any enclosure. Also, generator sets can be plugged into shore power. Installation involves bolting the generator to the frame, connecting a battery positive cable from the generator to the battery; wiring a harness to the sleeper to connect to the control panel, and wiring a second wire to run 120V power to the cab. The "APU" is a concept using a small diesel engine to belt drive an alternator and refrigerant compressor. In addition a separate dedicated evaporator and condenser is installed. This device charges the OEM batteries with 12V DC while supplying air conditioning independent to that of the truck. (120 volt power is not available unless an inverter is used.) A fourth system called a "Hybrid" utilizes a 3.5 kw generator with belt driven compressor with flexible add-on choices of remote condenser and evaporator combinations. 1-2 days to install. Units consume 0.2 gph. One year warranty. Cost: \$6,000-\$7,700.

Other

- **AuraGen**

www.aurasystems.com (310) 643-5300

The Inverter/Charger System (ICS) is an induction power system that provides heat and air conditioning, electrical power, and engine heat as an option. This system does not use an auxiliary engine. When the vehicle is running the unit produces power, and when the engine is turned off, the ICS continues to provide power from a battery pack which is automatically recharged whenever the engine is running. Approximately 30 minutes recharge time is needed for each hour of battery use. The number of batteries is sized to meet average power and duration of engine-off service requirements (see weight in [Table A](#)). The power box is 0.75 cubic foot and can be mounted anywhere on the truck. The under-the-hood mounted AuraGen generator can be belt driven or PTO driven and is .325 cubic feet. It can directly power any electrically operated HVAC system or can be integrated with electrically operated air conditioners separately. Baffling of exhaust heat from the Electronic Control Box (ECU) can provide cabin heat without the need of an extra heater. No maintenance is necessary. One to two days to install. A 3-year warranty is standard and a 5-year expanded warranty is available. Cost: \$7,000

- **Dometic Corporation (Tundra)**

www.tundra.cc (800) 234-8778

Dometic offers heating and cooling appliances that operate off 120V AC or 12V DC. The units are available in 7K, 10K, or 14K BTU cooling capacities, and 3.4K to 8.5K BTU heat capacities. Units are available in either a self-contained or remote configuration to allow for maximum flexibility. Design of the installation kit can be customized, based on the customer's needs, requirements, and truck type. These units will work with any source of 120V AC power, such as a generator, shore power, or battery/inverter systems. There is no routine maintenance required for these systems. Installation time is two to six hours depending on the type of system being installed. Cost: \$1000-7000 depending on complexity of system chosen. The self-contained units weigh between 62-104 lbs., and the remote units weigh between 87-91 lbs.

- **Paddock Solar**

www.paddocksolar.com (888) 793-9899

This company manufactures a solar panel fitted on the cab profile. The panel is made up of flexible individual solar strips assembled together and mounted into a polyurethane texture coated enclosed steel frame. The framed panel then mounts to aerodynamically styled truck cab roofs. Each panel

generates approximately 2 amps @ 18.6 DC volts during daylight hours. The solar generated DC electrical charge runs through a supplied charge controller set at 14.2 volts, then routes directly into the OEM truck or independent batteries. The battery can then be used for running accessories during the day without the truck idling and without depleting the batteries original electrical capabilities. Optional independent batteries can be used to store the generated electricity for night time use and the battery recharged during the daylight hours. Up to three panels will fit on most "Condo" style aerodynamically shaped cabs. Wired together in parallel, the panels can produce up to 6 amps of current. Each solar panel is packaged as a complete independent charging system. All necessary wiring from the panel to the battery, a charge controller, all mounting hardware, a safety harness and installation instructions are included. Multiple panels can be ordered per truck. Installation takes about 1 hour for mounting the panel to the cab and 1 hour for routing the wiring through the cab. A single Paddock Solar panel is designed to work with a Espar D-2 diesel fired heater (\$1,425) and an Southwest Solar Double 8" Evaporative Cooler (\$1,150). Cost per Paddock Solar panel is \$999.00 (not incl. installation). Weight 30 lbs. Warranty is 90 days.

- **Webasto**

www.BlueCoolTruck.com (800) 215-7010

Webasto's Blue Cool technology is a cold-energy storage and transfer technology. This technology provides bunk cooling, and charges itself while the vehicle is in motion. The Blue Cool unit produces up to 10 hours of bunk cooling in 90+ F temperatures, and does not require additional batteries. Within the exterior mounted unit, two aluminum coil-circuits surround the storage core's graphite matrix. One circuit carries refrigerant gas to freeze the material, and the other holds the 50/50 mix of glycol and water to transfer the cold out of the core and into the interior of the truck. Specifications include: 17,000 Btu Thermal-Storage, 3.5-10 Amp draw, and a system weight of 326 lbs. Competitive advantages include: a maintenance-free system, no additional batteries needed, and no fuel consumed during operation. The unit takes 8-16 hours to install, comes with a 3-year warranty, and costs \$3,350.

Stationary

Electrified Parking Spaces - Dual System (this requires technology both on the truck and in the ground)

- **Phillips and Temro Industries**

www.phillipsandtemro.com (800) 328-6108

Cab Power is a series of pre-wired, regulatory approved distribution components that allows for shore power connectivity and, with the additional purchase of an APU and block heater, can provide heat, air conditioning, and electrical power. The system contains a load center (with GFCI, circuit breaker and open-neutral protection devices), surface or flush mounted receptacles and interface wiring. All components have approved connectors for snap together installation. This wiring system can be interfaced with inverters, electric HVAC units, and gen-sets. The company also manufactures block heaters. All products are available at the OEM level. Cost: \$125

- **Shurepower™, LLC**

www.Shurepower.com (315) 404-5613

Shurepower™ has developed a comprehensive, commercial shore power product for the trucking industry to reduce truck tractor idling. Shurepower™ offers the truck stop stationary infrastructure as well as the on-board tractor equipment to connect to shore power. Entry level tractor connection kits start at under \$200 up to more than \$2000, depending on the desired level of equipment. Shurepower™ services include 120V AC power, 240V AC power, Internet, WiFi, local telephone and cable television. Complementary services are being offered to registered fleets and operators for a three month introductory period. Paid services start as low as \$0.50 per hour. Shurepower™ installs and maintains the stationary equipment at no cost to the host site which also receives a portion of the revenues generated from service sales.

- **Teleflex, Inc. (Proheat)**

www.proheat.com (604) 270-6899

Teleflex offers four products, three truck-mounted and one stationary: Proheat X-45 (diesel fired

heaters), M-Series (higher output heaters), Proheat Gen 4 (APU), and the Proheat CCU Shore Power (electrified truck spaces). For their electrified truck spaces unit, Teleflex offers the CCU Shore Power unit. This is an HVAC heating and cooling unit of their APU combined with shore power kit that accepts electricity in the form of a standard 110V/15Amp household extension chord. It provides electric heating and cooling without running a generator at all and without noise or pollution in or around the truck. The shore power kit consists of a battery charger and a transfer switch; the CCU provides heating and cooling and fits under the bunk. A nationwide sales and service dealer network provides an excellent leasing program with a 2-year warranty on all parts and labor. Installation can be completed in four to five hours. Cost: \$2,500

- **Xantrex Technology & Cab Comfort**

(800) 887-1881

Xantrex Technology manufactures the TRUCKPOWER Inverter/Charger and Cab Comfort manufactures the Duo-Therm heat pump. Both of these technologies work together to provide heat, air conditioning, and electrical power with shore power (i.e., an electrical grid). Xantrex's product provides AC power from the truck's batteries (the inverter charges the 12 VDC into normal household AC; the AC output is permanently wired to standard electrical outlets located in the sleeper compartment). When connected to shore power, the product automatically passes AC power to 120 V appliances. At the same time, the built-in battery charger recharges the batteries. For DC appliances, the 12 V power supply provides DC power without depleting the truck's batteries. Cab Comfort provides the electric heat pump for heating and air conditioning. It can be mounted on the roof or the floor. This combination product requires shore power. Cost for Inverter/Charger: \$1,500. Cost for electric HVAC: \$1,500. Cost for shore power: \$2,500 per space.

Electrified Parking Spaces - Single System (this requires technology only in the ground)

- **CabAire LLC**

www.cabaire.com (860) 745-2433

This company calls their product the "CabAire Travel Plaza Lot System." They sell the technology to the location owner who then manages the system. Their "modular service towers" provide each truck cab with ultraviolet treated hot and cooled air, block, reefer and 110V power outlets and internet and cable TV ports. The technology adapts to small and large lots to optimize space. No office trailers or overhead superstructures are required. Their "service towers" connect to an electrical grid with each space consuming 30-45 amps. The "service tower" is designed as a web based communication device for ease of communications, upgrades and serviceability. Dark-sky law compliant lighting and security cameras offer added value and security for drivers and facility owner. The "service tower" can communicate with Intelligent Transportation Systems/Variable Message Signs. They also provide time and attendance to automate payroll processing, and secure access systems to protect assets. The system measures 14' high, with a base of 5'. For cost estimates, contact company.

- **Craufurd Manufacturing, Inc.**

www.craufurdmanufacturing.com (413) 323-4628

Craufurd manufactures the Aire-Dock System, which provides air conditioning, heat, and electrical power for on-board appliances. The Aire-Dock pedestal is 78" H x 30"W x18 D". A 6' insulated hose and internet cable connect the Aire-Dock pedestal to a universal window adapter that fits into any truck cab window. The window adapter supplies the heat and air conditioning, and internet to the truck cab. The window adapter has two 110V outlets inside for appliances, plus an external outlet on the pedestal for block heater or transportation refrigerator unit engine. The equipment can be purchased, leased or joint ventured with no minimum or maximum space requirement. The system costs \$8,550 per space.

- **IdleAire Technologies Corporation**

www.idleaire.com (865) 342-3600

IdleAire provides an advanced truck stop electrification (ATE) product as a stationary system. Unlike traditional truck stop electrification (TSE), this company erects a structure above the parking spaces with an HVAC unit for each space attached. A concentric hose and integral cabling network connect the HVAC to a touch screen service delivery module, which fits into the cab window using a \$10 adapter, a one-time purchase and the only truck "retrofit" required. The module delivers heat

and air conditioning, internet, telephone access, satellite television, movies on demand and interactive driver training to the cab of the truck. The module also features 120V outlets inside and outside the cab for appliances and engine/oil heaters. IdleAire installs, operates and maintains equipment at no capital cost to property owners and with minimum installations of 50 spaces. Systems are currently deployed in 34 states; check with IdleAire for locations. The service charge is \$2.18/hour retail and \$1.85/hour for fleets with contract agreements.

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Table A, Comparison Table for Truck and Locomotive Idle Reduction Technologies

Company / Model	Diesel Engine	Electrical Output	Heats Truck Eng. Coolant	Air Conditioning Output (Btu/hr)	Heater Output (Btu/hr)	L x H x W (inches) weight (lbs)	Retail Cost
AuraGen Inverter / Charger System	N/A	6 or 8.5 kW, 120V AC or 240V AC with 200 Amp 14V DC Shore power capability	Optional	Yes, merged with truck AC or independent electrical	Yes, 3400 maximum from ECU exhaust heat	30 x 10 x 12 + under hood component + batteries; 490-710 lbs	\$7,000
Automotive Climate Control (ACC) Fuel Fired Heater (air-to-air) FFHD 2	N/A. Battery draw: 2.5 amps 12V or 1.25 amps 24V	N/A Shore power capability	No	No	7,000	14 x 5 x 5 7.7 lbs	\$990 with automatic control \$931 with manual control
Autotherm Division Enthal Systems, Inc T-2500 Energy Recovery System (ERS)	N/A	N/A	No	No	Similar to truck engine output	3 ¾ X 2 X 2 ½ in. 5 lbs	Less Than \$550
Aux Generators Inc. Idle Hawk	Kubota 1 cyl air-oil cooled	5400 watts 110V AC 60Hz	Yes	Yes, independent 15,000	Yes 18,000 (1800 watts)	19.5 x 26 x 24 315 lbs	\$6,900
Auxilliary Power	Kubota	Provides 130 amp	Yes	Yes, merged with truck	Yes	29 x 26 x 23,	\$7,900

Table A, Comparison Table for Truck and Locomotive Idle Reduction Technologies

Company / Model	Diesel Engine	Electrical Output	Heats Truck Eng. Coolant	Air Conditioning Output (Btu/hr)	Heater Output (Btu/hr)	L x H x W (inches) weight (lbs)	Retail Cost
Dynamics, LLC	3 cyl.	12V DC power, No 115V AC		A/C	truck heater	360 lbs	
Bergstrom, Inc. <i>NITE</i>	N/A	N/A	N/A	Yes, 3,000	Yes 2,900-7,500 (1800 watts)	AC: 22 x 11 x 16 Heat: 12 x 5 x 4 Battery: 10 x 11 x 14 Combined weight: 210 lbs	\$3,495
Carrier Transicold <i>ComfortPro APU</i>	Kubota 2 cyl. 13.9 hp	4 kW 110/120V AC 60 amp@ 12V DC	Yes	Yes, 10,000 independent	Yes, 10,000 electric	Eng/Gen: 18.5 x 25 x 28.5 Heat/AC Unit (outside): 28 x 15 x 12 Condenser (outside): 26.5 x 17 x 7.5 460 lbs	\$8,000 - \$9,000 installed
Comfort Master	Yes; Isuzu 3 cyl	3000	Yes	31,000	31,000	24 x 26 x 24; 400 lbs	\$7,200; \$8,100
CSXT <i>K-9 (Locomotive Only)</i>	Kubota 4 cyl	240/120V AC, single phase; 6 kW oil heat; 120V lighting; 240V AC / 70V DC battery charger	Yes, 9 kW water heat	Yes, 36,000 BTU 240V AC air conditioning (requires purchasing HVAC)	Requires purchasing HVAC	3 x 4 x 4 (ft) 1,200 lbs.	\$35,000 - \$40,000
Dometic Corporation	N/A	N/A	No	7K, 10K, or	3400 to	Self contained	\$1,000 to

Table A, Comparison Table for Truck and Locomotive Idle Reduction Technologies

Company / Model	Diesel Engine	Electrical Output	Heats Truck Eng. Coolant	Air Conditioning Output (Btu/hr)	Heater Output (Btu/hr)	L x H x W (inches) weight (lbs)	Retail Cost
(Tundra)				14K	8500	or remote	\$7,000
Double Eagle Industries, <i>Gen-Pac</i>	Kubota 3 cyl.	5 or 8 kW, 51 amp 12V DC includes 120V DC	Yes	Yes, merged with truck A/C	Yes (truck heater)	29 x 29 x 36 582 lbs (w/AC)	\$8,400
Espar <i>D1LC</i>	N/A Battery draw: 2.5 amps	N/A	No	No	Yes, 7,500	14 x 5 x 5.3 7.7 lbs	\$1,374
Espar <i>D3LC</i>	N/A Battery draw: 3.0 amps	N/A	No	No	Yes, 12,000	16.6 x 6 x 6.3 14.3 lbs	\$1,790
Espar <i>Airtronic D2</i>	N/A Battery draw: 2.6 amps	N/A	No	No	Yes, 7,500	12.2 x 4.5 x 4.8 6.0 lbs	\$1,374
Espar <i>Aitronic D4</i>	N/A Battery draw: 3.3 amps	N/A	No	No	Yes, 13,600	14.6 x 5.5 x 5.9 9.9 lbs	\$1,790
Espar <i>Hydronic 5</i>	N/A Battery draw: 4.4 amps	N/A	Yes	No	Yes, 13,600	9.75 x 3.5 x 6.3 6.9 lbs	\$1,405
Espar <i>Hydronic 10</i>	N/A Battery draw: 10.4 amps	N/A	Yes	No	Yes, 13,600	13 x 5.3 x 9.3 14.3 lbs	\$2,600
Frigette Truck Systems - <i>Gen Set 1</i>	Kubota 2 Cyl 11 hp engine	5.5 KW electrical output 40 amp 12V	Yes, use block heater	Yes, 10,000	Yes, 1,500 watts	23 x 20 x 21 385 lbs	\$7,495

Table A, Comparison Table for Truck and Locomotive Idle Reduction Technologies

Company / Model	Diesel Engine	Electrical Output	Heats Truck Eng. Coolant	Air Conditioning Output (Btu/hr)	Heater Output (Btu/hr)	L x H x W (inches) weight (lbs)	Retail Cost
		DC, 120V AC					
Frigette Truck Systems - Gen Set 2	Kubota 1 Cyl 7 hp engine	3.5 KW electrical output 40 amp DC 120V AC	Yes, use block heater	Yes, 10,000	Yes, 1,500 watts	30 x 15 x 17 282 lbs	\$6,495
Frigette Truck Systems - APU	Kubota 1 cyl 7 hp engine	120 Amps of 12V DC	No	Yes, 12,000	Yes, 15,000	26 x 15 x 16 190 lbs	\$5,895
IdleAire Technologies, Inc	Power source: grid or off-grid electric power	Two 20 amp 120V AC circuits	120V AC power for block heater	Yes, 18,000; independent of truck	Yes, 17,000; independent of truck	No hardware added to the truck; one-time charge of \$10 for window template.	Service charge: \$1.50/hr (\$1.25/hr w/ contract).
Kim Hotstart Diesel Driven Heating System Senior (Locomotive Only)	Lister-Petter 3-cyl	72V DC	Yes, 20 kW water heat + 10 kW oil heat	No	N/A	24 x 49 x 33 1,000 lbs	\$30,000 - \$32,000
Kim Hotstart Diesel Driven Heating System Junior (Locomotive Only)	Yanmar 2-cyl	72V DC	Yes	No	N/A	23 x 50 x 32 750 lbs	\$16,000 - \$18,000
Kim Hotstart Electric Powered Heating System (Locomotive)	N/A	N/A, battery charging optional	Yes, 24 kW water heat + 6 kW oil heat	No	N/A	17 x 44 x 27 100 lbs.	\$4,000 - \$14,000

Table A, Comparison Table for Truck and Locomotive Idle Reduction Technologies

Company / Model	Diesel Engine	Electrical Output	Heats Truck Eng. Coolant	Air Conditioning Output (Btu/hr)	Heater Output (Btu/hr)	L x H x W (inches) weight (lbs)	Retail Cost
Only)							
Kool-Gen / KG-1000	Yanmar 2-cyl	40 amp AC 115V	No	17,500 BTU	10-20,000 BTU heat optional	27 1/2 x 24 x 19 approx. 425 lbs.	\$6295
Phillips and Temro / Cab Power 8500633	Shore Power	120V AC 15 Amps (30 amps optional)	Yes, use block heater	Mates to HVAC	Mates to HVAC	Load Center 5" x 5" x 3" System 5 lb.	\$125
Pony Pack, Inc. Pony Pack	Kubota 2 cyl. 10.8 hp	105 amp 12V DC No 110V AC	Yes	Yes, merged with truck A/C	Yes, truck heater	26 x 25 x 24 300 lbs	\$7,000
RigMaster Power Systems, Inc. (Div. of International Power Systems Inc.) Rig Master Power	Perkins 2 cyl. 10 hp	4 kW, 30 amp 110V AC, 25 amp 12V DC	No, can use block heater	Yes, 20,000 (independent of truck engine)	Yes, 12,000 (Uses APU coolant to heat sleeper)	Main Unit: 27 x 29 x 30, 393 lbs; Bunk Heater/AC Unit: 14 x 9.25 x 9.25, 27 lb	\$6,300
Safer Corporation VIESA	N/A	N/A	N/A	Yes, Evaporator	N/A	30 x 40 x 6.5 Tank 4 x 10 x 15 126 lbs.	\$1,240
Shurepower™, LLC	Power source: shore power grid or off grid electric power	20 Amp 120V AC, 30 Amp 120V AC, and 50 Amp 240V AC	120V AC power for block heater	Yes, depends on vehicle equipment	Yes, depends on vehicle equipment	Depends on vehicle equipment; 10-200 lbs	Service charge: \$0.50 to \$1.00 depending on level of service and

Table A, Comparison Table for Truck and Locomotive Idle Reduction Technologies

Company / Model	Diesel Engine	Electrical Output	Heats Truck Eng. Coolant	Air Conditioning Output (Btu/hr)	Heater Output (Btu/hr)	L x H x W (inches) weight (lbs)	Retail Cost
							location
Star Class 4500	Yes; Perkins	4.3 kW Continuous (6.5 peak)	Yes	10,000-13,500 AC Optional		19 3/4 x 23 x 28; 287 lbs	\$5995 (not incl install)
Star Class 6000	Yes; Lombardina	5.5 kW Continuous (8 peak)	Yes	10,000-14,000	5,000-8,000	24 x 25 x 29; 335 lbs	\$6550 (not incl install)
TAS Distributing Inc. <i>Temp-A-Start</i>	N/A	N/A	Yes	Same as truck	Same as truck	Unknown, 14 lbs	\$2,500
Truck Gen <i>UCT 1-3.5</i>	Kubota 1 cyl. 7 hp	3.5 kW 40 amp DC, 120V AC	No, can use block heater	Yes, 10,000	Yes, 1200 watts	30 x 15 x 17; 220-280lbs w/ air	\$6495
Truck Gen <i>UCT 2-5..5</i>	Kubota 2 cyl. 11 hp	5.5 kW 40 amp 12V DC, 120V AC	No, can use block heater	Yes, 10,000	Yes, 1200 watts	23 x 20 x 21; 385 lbs w/ air	\$7495
Truck Gen <i>UCT-APU</i>	Kubota 1 cyl./7hp	120 Amps of 12V DC	No	Yes, 12,000	Yes, 15,000	26 x 15 x 16; 150-190 lbs	\$5,895
Webasto <i>Air Top 2000</i>	N/A	N/A	No	No	Yes, 7,000	12.7 x 5 x 4.8 8 lbs	\$1,000
Webasto <i>Air Top 3500</i>	N/A	N/A	No	No	Yes, 12,000	16 x 5 x 5 13.2 lbs	\$1,650
Webasto <i>TSL 17</i>	N/A	N/A	Yes	No	Yes, 17,000	9.1 x 4.1 x 6.4	\$917

Table A, Comparison Table for Truck and Locomotive Idle Reduction Technologies

Company / Model	Diesel Engine	Electrical Output	Heats Truck Eng. Coolant	Air Conditioning Output (Btu/hr)	Heater Output (Btu/hr)	L x H x W (inches) weight (lbs)	Retail Cost
						7 lbs	
Webasto <i>Thermo 90S</i>	N/A	N/A	Yes, 45,000	No	Optional	24 x 9 x 11 65 lbs	\$2,300

APPENDIX II - SmartWaySM Transport Partnership Overview

*Published by the SmartWaySM Transport Partnership
U.S. Environmental Protection Agency*

SmartWay Transport is a voluntary partnership between various freight industry sectors and EPA that establishes incentives for fuel efficiency improvements and greenhouse gas emissions reductions. By 2012, this initiative aims to reduce between 33 - 66 million metric tons of carbon dioxide (CO₂) emissions and up to 200,000 tons of nitrogen oxide (NO_x) emissions per year. At the same time, the initiative will result in fuel savings of up to 150 million barrels of oil annually. There are three primary components of the program: creating partnerships, reducing all unnecessary engine idling, and increasing the efficiency and use of rail and intermodal operations.

Creating Partnerships

Partnerships with companies and organizations are the foundation of the SmartWay Transport Program. EPA welcomes any company or organization that will improve the environmental performance of their freight operations. Key Partners are companies that ship products and the truck and rail companies that deliver these products. Partners commit to measure and improve the efficiency of their freight operations, using EPA-developed tools that quantify the benefits of a number of fuel-saving strategies.

Providing and developing innovative financing for Program Partners

The SmartWay Transport program is working with states, banks, and other organizations to develop [innovative financing options](#) that help partners purchase devices that save fuel and reduce emissions. See how your company can reduce emissions and save money by visiting our [SmartWay Technology Package Savings Calculator](#).

Establishing the National Transportation Idle-Free Corridors Program

Reducing unnecessary idling improves air quality, saves fuel and saves companies money. Another component of the SmartWay Transport Partnership is to eliminate unnecessary truck and rail idling by developing a nationwide network of idle-reduction options along major transportation corridors - truck stops, travel centers, distribution hubs, rail switch yards, borders, ports, and even along the side of the road.

Maximizing Rail Efficiency and Intermodal Operations

Ton-mile for ton-mile, rail is a very efficient mode of transportation. A third component of the SmartWay Transport Partnership is to highlight practical opportunities where rail can be better utilized and to encourage more efficient rail operations and technical innovation.