Green Transport Partnership

A Glance at Clean Freight Strategies: Idle Reduction

What is the challenge?

Many long-haul truck drivers idle their engines during rest periods to

- provide heat or air conditioning for the sleeper compartment,
- keep the engine warm during cold weather, and
- provide electrical power for appliances.

Using a heavy-duty truck engine to power cab amenities is grossly inefficient and causes excessive fuel use and emissions. Today's diesel engines do not need to idle for long periods of time before and after driving. In fact, idling often causes more engine damage than starting and stopping.

Studies by Argonne National Laboratory and EPA suggest that long-haul trucks often idle for six to eight hours per day, over 300 days per year. Trucks consume up to one gallon of diesel fuel for each hour of idling, using as much as 1,000 to 3,000 gallons of fuel every year per truck. Unnecessary engine idling increases fuel costs and causes emissions that contribute to local air pollution and global warming. It also causes engine wear and increases truck maintenance costs.

What's the solution?

Several technological options can assist drivers in reducing truck idling.

- An *auxiliary power unit* (APU) is mounted externally on the truck cab and consists of a power source, such as a combustion engine, to provide electricity and heat. Electricity from the APU can be used to power air conditioning, heating, and electrical accessories for the cab and sleeper. APUs also have the advantage of continuing to heat in case of an engine breakdown while not draining battery power.

- *Automatic engine idle systems* (AEIS) start and stop the truck engine automatically to maintain a specified cab temperature, or to maintain minimum battery charge. Drivers typically activate the system in the evening and program a desired temperature range.
- *Truck Stop Electrification* (TSE) is another option for reducing truck idling. At properly equipped truck stops, drivers can simply plug trucks into outlets to

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power heaters, air-conditioning, marker lights, and other accessories. Trucks need to be equipped with the internal wiring, inverter system, and HVAC system necessary to take advantage of external power. This system is sometimes referred to as "shore power" reflecting its common use in marine applications.

- *Advanced Truck Stop Electrification* can provide heating and cooling from an external source. Truck parking bays are installed with systems that provide the cab with heating, cooling, and other amenities through an external console. The truck-side console has temperature controls, an air supply and return pipe, a credit card reader, keypad, and 100 VAC outlet.

The results are in...

The amount of idling varies widely among trucks by season, type of operation, and driver practices. EPA estimates that long haul trucks typically idle 2,400 hours per year, consuming 1,800 gallons of fuel. Using an APU instead of idling the engine will reduce this fuel use by nearly 75 percent, saving $2,000 annually plus another $330 in maintenance costs. Using an AEIS typically reduces idling by at least 50 percent, saving $1,350 in fuel costs and $170 in engine maintenance per year. TSE and Advanced TSE can potentially eliminate all engine idling, although because the systems can only be used at stations outfitted with the appropriate equipment, not all of these savings can be realized currently. TSE pilot projects are underway in areas where they are most useful-stops along heavily traveled freight routes.

Next Steps

Long-haul truck fleets should examine engine operating records to determine the percent of time spend idling. Trucks that idle more than ten percent of operating time can likely benefit from idle reduction technologies and related driver training. More information about idling reduction is available at EPA's website at www.epa.gov/otaq/retrofit/idlingtech.htm or at DOE's website at www.trucks.doe.gov/plain-talk/idling.html (DOE)