

# **Fleet and Owner-Operator Capacity for Utilizing Idle Reduction Technology: A Report to the US Environmental Protection Agency**

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## Executive Summary

In order to reduce long-term idling along the Oregon I-5 corridor, the US Environmental Agency entered into a collaborative research and implementation program with Oregon State University, the Oregon Climate Trust, and Shurepower (producers of truckstop electrification equipment) to install Shurepower stations at truck stops in Oregon. This research component

- characterizes the existing capacity of the fleets and owner-operators who idle in Oregon to use the Shurepower technology and
- describes the incentives and constraints for fleets and owner-operators to invest in technology that allows their drivers to use Shurepower technology.

In-depth, face-to-face interviews were completed with owner-operator truck drivers at three truck stops in Oregon and phone interviews with equipment buyers at fleets with trucks driving in Oregon. Notes were taken during the interviews and analyzed to answer the research questions described above.

In general, we found that all respondents were concerned about long-term idling for a variety of reasons including cost, driver health, noise, and pollution. The most widely used idle reduction technology currently in use by owner-operators are additional batteries and inverters that allow the use of on-board amenities including (among other things) microwaves, TVs, VCR-DVDs and computers. About 40% of the respondents were familiar with Idleaire technology; and while most respondents have heard of Shurepower, none have ever used it and only a few have even seen it. One fleet has equipped their trucks with Shurepower retrofits, the other fleets were experimenting with other idle reduction options including incentive programs, APUs, and automatic shut-off technology.

Both fleet representatives and owner-operators perceive the largest drawback to the Shurepower technology is the small number of planned spaces at a few truck stops. They see this place-based technology as limiting to drivers who cannot find a technology-equipped space, cannot reach an equipped truck stop due to rest regulations, and/or who are not driving regularly along the I-5 corridor. Once a truck is equipped with the enabling technology, however, Shurepower is perceived as an inexpensive, easy to use option for reducing idling.

Recommendation for promoting and increasing the use of Shurepower technology in Oregon include targeted marketing of the benefits, services, and locations of Shurepower- equipped sites, low-interest loan programs for retrofitting trucks, and promotion of the anti-pollution and health benefits of Shurepower over currently used technologies.

## **1. Description of Problem**

Truck idling for extended periods of time is a major source of air pollution along U.S. roadways. In many situations, however, truck drivers need to control the temperature in their cab for comfort and safety. Drivers also need access to power for amenities one expects to use day-to-day while on the road. Several technologies are available to reduce truck engine idling including additional batteries, alternative power units (APUs), shore power such as Idleaire and Shurepower, and, experimentally, fuel cell technology.

In an effort to reduce the necessity of long-term idling in Oregon and the associated consumption of fossil fuel and resulting air pollution, a collaborative effort is underway between the U.S. Environmental Protection Agency (US EPA), the Oregon Climate Trust, and Shurepower (producers of truck electrification technology) to provide shore power truck stop electrification (using the Shurepower product) at four test sites along the Interstate 5 (I-5) corridor in Oregon. Concurrent studies are also taking place on the I-5 corridor in Washington and California.

If the electrification project is to be successful, truck drivers must be able and willing to use the Shurepower technology that will be installed at these four Oregon sites. This will require technology retro-fits on existing trucks and plug-in capacity on new trucks. Costs of the retrofit technology are dependent on the existing engine system of each truck but could range from a few hundred dollars to \$3000 per truck.

This component of the larger project explores the capacity of long-haul truck drivers on I-5 in Oregon to use Shurepower technology. There are two objectives:

- Characterize the existing capacity of the fleets and owner-operators who idle in Oregon to use the Shurepower technology.
- Describe the incentives and constraints for fleets and owner-operators to invest in technology that allows their drivers to use Shurepower technology.

After a brief description of the methods we used to collect and analyze data, we describe what we learned from our respondents. This is followed by recommendations for the implementation of Shurepower technology along the I-5 corridor in Oregon.

## **2. Methods and Procedures**

Based on recommendations from members of the Oregon Solutions Team working on the electrification project and key informants from the Oregon Trucking Associations and the Lane Regional Air Pollution Authority, we decided to talk with a sample of (1) companies that carry “truckloads” along the I-5 corridor and (2) owner-operators with routes along I-5. We contacted individuals responsible for specifications and/or purchases at five companies and conducted 15-45 minute phone interviews with each. The five companies were Interstate Distributor, Kool Pak, Market Transport, Sherman Brothers, and Swift. This sample is “purposive” in the sense that we talked with representatives of the kinds of companies that we knew had fleets with trucks that regularly idled along I-5. It is not possible to statistically generalize from these interviews to the larger group of companies with fleets idling along I-5, but we can use the information to get a sense of the issues of concern to this population.

We also talked with truck owner-operators who idle in Oregon. Fifteen one-on-one interviews were conducted with owner-operators at three truck stops on the Oregon I-5 corridor: Jubitz (Portland), Petro Medford, and Travel America Coburg. Posted signs in the truck stop restaurants offering a \$10 truck stop gift certificate were used to recruit interviewees. The project interviewer also invited truck drivers seated in the restaurant to participate. This approach constitutes a sample of convenience – we interviewed the drivers who showed up when we were there - and, while we are unable to generalize to the larger population of owner-operators driving along I-5, we did hear consistent responses from all of the drivers who participated.

The owner-operators we talked with were male and ranged in age from approximately 25-60 years old. Eleven were White, two Hispanic, one Black, and one East Indian. The length of time respondents had worked as long-haul drivers ranged from under one year to over 40 years. Their routes include the entire United States, the lower 48 states, the Midwest and west, the southeast and southwest, and a variety of routes along the I-5 corridor.

Notes were taken during each interview and transcribed for analysis by the entire research team. After briefly describing their job and/or their company, respondents were asked about issues related to idling, their impressions and experience with idling reduction technologies (auxiliary power units (APUs), batteries, Shurepower, Idleaire, and fuel cells), future plans for idling reduction, and whether they might qualify for low-cost loans to help pay for technology (e.g., how much time they drive/idle in Oregon, where the truck is base-plated, etc.) Demographic data (length of time driving/working for company, approximate age, sex, and race/ethnicity) were noted for each respondent as well.

Individually, we all examined the transcribed interviews looking for patterns; was there any consistency in the responses? Were there large differences among drivers? How were responses from owner-operators and fleet representatives different? The same? We compared our results and reconciled any differences in interpretation. The discussion below uses quotes (or paraphrases of quotes as necessary) to illustrate the issues that drivers and fleet representatives raised.

### **3. Results of Interviews**

In general, all respondents were concerned about idling for a variety of reasons. Both fleet representatives and owner-operators mentioned the increasing cost of idling; they are also concerned about safety and comfort of drivers who idle when temperatures are extremely hot or cold. Some, but not all, respondents also mentioned pollution concerns related to idling. For example, one respondent who drives the I-5 corridor several times each month sums up the many issues related to idling:

[I] think the Clean Air Act should make idle reduction mandatory and that manufacturers should install the technology on all new trucks. . . . there is a safety issue with regard to drivers being uncomfortable and not getting enough rest. This is partly due to the noise of truck idling. [I] believe in an unwritten trucker's code that you should park away from other truckers if you must leave your truck idling. The fact that fuel costs have nearly doubled in the last two years has helped to reduce truck idling.

Interestingly, fleet representatives are more likely to believe that considerable idling takes place along I-5 in Oregon than most owner-operators who claim they idle infrequently, and only when temperatures are extremely cold or hot.

### **Idling Reduction Strategies in Use**

We asked fleet representatives and truck drivers about five idling reduction technologies: additional batteries, APUs, Shurepower, Idleaire and fuel cells. Among these technologies, the most widely used by owner-operators were batteries and/or inverters (87%), mostly to power amenities other than heaters and air conditioners. These amenities include (but are probably not limited to) microwaves, TVs, VCR-DVDs, fax machines, computers, printers, apartment-size refrigerators, electric blankets, cell phone chargers, food coolers, electrical tools, lighting, GPS, space heaters, copy machines, and an automatic cat litter box (!).

A significant number (25%) of owner-operators are also outfitting their trucks with APUs. APUs are often used for the cooling and heating of the cabin during rest periods, as well as for preventing the fuel in the main tank from gelling during rest periods in cold weather. APUs are popular due to the fact that they are available to use anywhere the driver may stop for a rest period. As one driver commented, “Cost-recovery is a factor, but APUs are [my] first choice. I don’t usually drive a fixed route, so finding Idleaire units is a problem. With increasing idling regulations, [I am] looking for a flexible alternative, which an APU can provide.”

Other idle-reduction technologies used by owner-operators include portable generators and diesel heaters, as well as “good sleeping bags” and electric blankets. Owner-operators often seek their own novel solutions to the high costs of idling. One mentioned converting a generator and air conditioning unit from a motor home for use in his truck. One respondent who drives between Ontario, Canada and Los Angeles describes all the anti-idling technologies he’s tried:

[I] use shore power, sometimes an RV generator, and an Espar (diesel) heater. I previously used a “Park and View” – also called a “turtleback – which was available at truck and travel stops. . . . they offered phone and TV hookups, somewhat like the old drive-in movie speakers. They have since gone out of business.

Most owner-operators interviewed were aware of Idleaire, and 40% of owner-operators had used this technology at some time. None of the owner-operators interviewed had ever used Shurepower, although many had heard of it. Four owner-operators were not aware of Shurepower.

Among the fleets, one company has installed APUs in all of their trucks after first testing the technology for practicality and cost savings. Another has tested APUs and found that they are not cost effective compared to using an automatic start/stop system on the main engine to heat and cool the cab. The company is also researching other idle reduction technologies such as battery operated air-conditioning units and hydrogen fuel cells. This same company is concerned about the lack of insulation in truck cabs; our respondent said that according to their tests, “...the cabs of most trucks have an R-value of less than 2.” Another fleet has decided not to take any specific action at this point, but to simply absorb the financial cost of idling. One fleet has trucks equipped to use

Shurepower and, since they believe that Shurepower “does not provide air conditioning,” they also are testing APUs to use in conjunction with Shurepower.

## **Incentives and Constraints**

One focus of our research was to understand the incentives and constraints for using Shurepower and other idling reduction technologies. We found the following issues raised by fleet representatives and owner-operators.

### ***Shurepower***

Of the fleets we talked with, only one company currently has trucks equipped to use Shurepower. They believe that Shurepower will be the cheapest option for them, but they are also looking at additional idling technology to provide air conditioning (i.e., APUs). The other companies are not considering Shurepower for a variety of reasons, primarily due to the lack of parking spaces equipped with the technology. As one decision maker told us, “until there is more availability of shore power units like Idleaire or Shurepower, this is not a viable alternative.” All fleet representatives also described cost of idling technology as a major concern. As another decision maker said, “Even as fuel prices rise, the cost of the technology is very high.”

Owner-operator capacity to use Shurepower technology is presently non-existent in our sample. While most respondents have heard of Shurepower, none have ever used it and only a few have even seen it. Owner-operators described several concerns about the technology.

- The plans to install a limited number of Shurepower equipped spaces at a few truck stops along the I-5 corridor will be a “drop in the bucket” according to our respondents. They told us, “the truck stops are always full of trucks [at night],” there are often not enough regular spaces for drivers who want to stop. Difficulty in finding Shurepower spaces – and finding them unfilled – is seen as a large drawback to many of our drivers.
- This general shortage of spaces at truck stops has created problems for those interested in using technology-equipped spaces. One respondent who has driven for a fleet, a tour bus company, and is now an independent driver observed that “Idleaire parking spots in the truck stops fill up quickly, often with trucks that don’t use the hook-up. This is because they are the parking spots closest to the terminal. This means that truckers who want to use the hook-up, can’t.”
- Most owner-operators operate with a small profit margin, and the cost of retrofitting their trucks to enable them to use Shurepower technology (or any idling technology) is of great concern. They need to make sure that any investment has a relatively short payback period, and that the technology will be useful in many settings.
- Shore power units are perceived by respondents as being most useful to drivers with dedicated routes, or who drive a main truck route. Drivers told us that you have to know where the units are located in order to use them; and only drivers that consistently drive a specific route will know where they are located.
- Some drivers indicated that when they stop to rest, they are tired and don’t want to “mess with hookups or wiring or starting generators.”

While most of the drivers have no experience with Shurepower technology, they were able to identify some incentives for using the technology.

- Shurepower is perceived as relatively easy to use. As one driver who travels the I-5 corridor four or more times each month told us, “[I] like the idea of having all the equipment on board and simply plugging in.”
- Shurepower is seen as providing a wide range of amenities. One driver who travels the lower 48 states said that he believed that Shurepower could be used to charge truck batteries and power a wide variety of electrical accessories.
- Once a truck is equipped, Shurepower is perceived by our respondents as the “cheapest” option for idling reduction.

In general, both fleet representatives and owner-operators perceive the largest drawback to the Shurepower technology is the small number of planned spaces at a few truck stops. They see this place-based technology as limiting to drivers who cannot find a technology-equipped space, cannot reach an equipped truck stop due to rest regulations, and/or who are not driving regularly along the I-5 corridor. Once a truck is equipped with the enabling technology, however, Shurepower is perceived as an inexpensive option for reducing technology.

### *Idleaire*

Idleaire, another place-based idling reduction technology, is currently more widely available than Shurepower. Both fleet drivers and owner-operators describe some experience with the technology. None of the fleet operators we talked with were considering Idleaire as their primary technology to reduce idling. Four of the five respondents identified the lack of technology-enabled parking spaces as the largest drawback for their drivers. As one of the respondents from a company with 20-40 trucks on the I-5 corridor between Washington and California on any given day told us

...docking stations like Idleaire or Shurepower might be a good option for owner-operators who operate on dedicated routes where their position would be predictable and they could be reasonably assured that they would be near a truck stop with these facilities when they came upon their rest period. For a fleet [like ours], it would be too much trouble to be at a specific stop at a specific time.

Another fleet representative reported that “Idleaire units are difficult to find on the West Coast, and most are in use when they are located.”

As mentioned earlier, most owner-operators interviewed were aware of Idleaire, and 40% of respondents had used Idleaire at some time. Their concerns echo the issues raised by representatives of fleets regarding availability and also include issues specific to the technology.

- One driver who uses the I-5 corridor several times a month and drives all over the US describes hooking up to an Idleaire unit as a “hassle” and, in addition, once you’re hooked up, you can’t use the door to get in or out of the truck.
- A driver who travels through the 48 states and Canada mentioned that he found that the “refrigeration unit for the air conditioning can bring truck exhaust fumes from nearby idling trucks and pump it into the cab of his truck if [I] have the air conditioner on.” Another driver who also travels throughout the US has a window grommet and has used Idleaire. He described it as, “so-so, not good for

cold weather. The heating unit in them is not good.” He supplements Idleaire with a portable electric heater in cold weather.

- A few drivers mentioned the fees involved in using Idleaire and concerns that the prices continue to rise. One driver who regularly stops at Coburg, Canyonville, and Medord truck stops told us that he would prefer that truck stops provide cheaper motel rooms for drivers who need to stop.

There were a few owner-operators who have used Idleaire and been impressed with its ability to reduce the need to idle. For example, one driver whose main routes are in the Midwest has used Idleaire and liked it. He thinks it could “save him a lot of money, since it costs \$21.85 to hook up for a night compared to \$30 to idle.” Most drivers describe the primary incentive to use Idleaire as the range of amenities it provides including, according to one driver, “cable TV, a computer internet hookup, heat and air conditioning, and phone hookup. There is even a push button to call for ‘carhop’ service.”

Like Shurepower, the greatest drawback to Idleaire is limited availability. Drivers who have used Idleaire appreciate its ability to deliver a full range of amenities, but others are concerned about the user fees and describe specific problems with the technology, especially related to air conditioning and heating, two of the major reasons for truck idling.

### *APUs*

Many of our fleet respondents have APUs on their trucks or are considering installing them. Three of the five companies have APUs on at least some of their trucks and one has installed APUs on all of its trucks. The main benefit as described by respondents is that “they can be used anywhere, even if the driver must stop between rest stops.” Others are proceeding more slowly and testing out the cost savings of APUs. For example, one company is testing an APU on one of its trucks, and while they do not “find much usefulness in anything except the APUs, it appears that the APU is not saving them all that much.” The biggest drawback to the APUs for these companies is the cost, estimated by respondents to be about \$8-9,000 per unit. As one respondent told us, “even with a projected eleven month return-on-investment time frame, it is difficult to justify an expense of \$9,000 per truck to purchase APUs for nearly 200 trucks.”

Several owner-operators also have APUs or have plans to purchase them. Many of our respondents had conducted extensive research on a variety of APUs, comparing them on a variety of criteria including initial cost, weight, maintenance costs, and amenities supported. Like the fleet representatives, they described the greatest benefit of APUs as the flexibility provided to drivers who may not be able to stop at a truck stop equipped with place-based technology. One driver who occasionally drives the I-5 corridor and avoids truck stops whenever possible because they are noisy, describes “APUs as excellent alternatives for the owner-operator; it is flexible. Can be used anywhere and saves about \$3000 a year on fuel and maintenance costs.” Another driver whose main route is between Chicago and California reported that, “cost-recovery is a factor, but APUs are my first choice. I don’t usually drive a fixed route, so finding Idleaire units would be a problem. With increasing idling regulations, I am looking for a flexible alternative, which an APU provides.”

This driver hints at the biggest drawback to APUs as perceived by owner-operators: the initial cost. Several described the cost as “too expensive” and others were skeptical of the actual amount of fuel savings. While APUs are quiet compared to an idling truck, one driver told us that “exhaust stays on the ground rather than being directed overhead like the truck’s stacks do to the engine exhaust.”

In general, fleet representatives and owner-operators perceive APUs to be a viable idling reduction technology primarily because of the flexibility it provides to drivers who may not be able to find a technology-enabled parking space. They are also perceived as cost effective, once the initial high cost has been recovered, and fleets and owner-operators are re-calculating fuel savings as the price of diesel continues to rise.

### ***Additional Batteries and Inverters***

One of the reasons why drivers idle is to power amenities that facilitate living in a truck. As described above, these amenities range from televisions to power tools, refrigerators to automatic cat litter boxes. Many drivers use additional batteries and inverters in their truck to provide electricity for these appliances. Four of the five fleet representatives we talked with reported that they did not supply additional batteries and/or did not encourage drivers to use them. One, however, has several trucks that have electric-powered air conditioning that requires special batteries that replace standard truck batteries. A larger alternator is also required to keep the batteries charged. This company also uses a combination of start-stop units for the main engine (tied to the cab temperature) and diesel-fired heaters to reduce idling.

Almost all (87%) of the owner-operators we talked with, however, have some combination of alternative batteries and inverters installed in their trucks. Batteries are a relatively cost-effective and proven method for providing electricity for appliances. They are flexible and available to the driver wherever they happen to stop. The biggest drawback to batteries is that, for the most part, they do not provide heating or cooling and, in especially cold weather, they do not stop diesel fuel from “gelling.” Only one driver, whose main routes include I-84 and I-90, doesn’t use any batteries because he is worried “about running them down and not being able to start the truck.”

### ***Fuel Cells***

Fuel cell technology is not currently available. However, we were interested in whether or not fleet representatives or owner-operators were aware of the potential benefits of fuel cells. Of the five fleet representatives we talked to, one has been involved in experimental fuel cell technology for idling reduction. According to this representative, “nothing has come of it yet.” Most owner-operators were unaware of any use of fuel cell technology for idling reduction.

## **4. Conclusions**

In general, everyone we talked to considers idling reduction an important issue. Many owner-operators suggested that the mild climate in Oregon makes idling for long periods of time less necessary than in other places of the country. Most drivers use some form of power in addition to the truck engine, in order to have access to equipment and amenities like cell phone chargers, computers, and VCRs. The most common strategy is to add

batteries; however, a significant number of fleet drivers and owner-operators use or are planning to use APUs.

Shore power in the form of Idleaire and Shurepower is not widely available on the I-5 corridor; in fact, the Oregon I-5 Idle Free Corridor Project will result in the first installations of Shurepower technology in Oregon and the West Coast.<sup>1</sup> Fleet representatives and most owner-operators know about Shurepower, but there are varying levels of interest in using it. Some view it as the most cost effective means of idle reduction, once trucks are equipped to use it, and the ease of use and range of amenities it offers are attractive to both fleets and owner-operators. The biggest hurdles to using Shurepower, besides its lack of current availability, are the possibility that there will never be enough plug-ins available to be convenient and, related to this, the technology's location at truck stops which have their own set of challenges for drivers. The need to retrofit trucks and the costs involved in doing so are also viewed as barriers to drivers and fleet representatives interviewed.

## **5. Recommendations**

Based on the results of our interviews, we make the following recommendations for promoting the use of Shurepower on the I-5 corridor in Oregon.

- Market the benefits of Shurepower technology and clarify exactly what services are available. Our research suggests that drivers will consider factors such as installation and use costs, ease of use, convenience of availability, and types of amenities offered when deciding whether or not to use Shurepower.
- Improve communications about where Shurepower units are available. Advertising on radio stations and satellite radio, and posters/flyers at truck and service stops can all be used to let drivers know where Shurepower spaces are available.
- Make low cost and/or low interest loans available to install Shurepower retrofit units in trucks. Many of the drivers and fleet representatives we talked with were Oregon-based, spent half or more of their time idling or driving in Oregon, had a truck that is base-plated in Oregon, and/or is an Oregon resident or company.
- Ensure that there will be Shurepower parking spots available, and that trucks will not be allowed to park in Shurepower spots without utilizing the technology (thus making it unavailable to those who wish to use it). For example, Idleaire has instituted a reservations system in cooperation with Travel Center of American and Petro Shopping Centers; this may reassure drivers that space will be available when needed.
- Consider a low “introductory” price of hookup, in order to introduce the technology and its merits to the truck driving population.
- Promote the anti-pollution and health aspects of the use of Shurepower technology as compared to other options. This is one area in which shore power has a clear advantage over APUs.

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<sup>1</sup> From their websites, Idleaire has 6 or 7 locations in California but none in Washington or Oregon; Shurepower only has locations in New York State.